

SCHOOL OF PHARMACEUTICAL SCIENCES  
GENEVA - LAUSANNE

# ANNUAL REPORT 2016



UNIVERSITÉ  
DE GENÈVE

Ecole de Pharmacie  
**EPGL**  
Genève – Lausanne

*Unil*

UNIL | Université de Lausanne

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# DIRECTION AND ADMINISTRATION

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Prof Jean-Luc  
WOLFENDER

## VICE-PRESIDENTS



Prof Eric  
ALLEMANN



Prof Leonardo  
SCAPOZZA

## ADMINISTRATOR



Mrs Annick  
de MORSIER

## ADMINISTRATIVE ASSISTANT / SECRETARY



Mrs Danielle  
COOSEMANS-VESIN



Mrs Dominique  
HUNZIKER

## STUDENTS' ADVISOR



Dr Elisabeth  
RIVARA MINTEN

## STUDENTS SECRETARY



Mrs Elena  
ONATE



Mrs Elisa  
MASSON



Mrs Axelle  
WIRTHNER  
commercial apprentice

## PROGRAMM DOCTORAL SECRETARY



Mrs Florence  
VON OW

## INFORMATIC STAFF



Mr Yann  
MANET



Mr Loris  
FRANCO



Mr Francisco  
MABIALA (auxiliary)

## ABBREVIATIONS

<i>PO</i>	<i>Full Professor</i>
<i>PAS</i>	<i>Associate Professor</i>
<i>PAST</i>	<i>Assistant Professor</i>
<i>PT</i>	<i>Adjunct Professor</i>
<i>PI</i>	<i>Visiting Professor</i>
<i>PD</i>	<i>Privat-Docent</i>
<i>MER / CC</i>	<i>Senior Lecturer</i>
<i>CE</i>	<i>Lecturer</i>
<i>CS</i>	<i>Research Associate and Senior Research Associate</i>
<i>MA</i>	<i>Senior Research and Teaching Assistant</i>
<i>POSTDOC</i>	<i>Postdoctoral Scholar</i>
<i>ASS</i>	<i>Research and Teaching Assistant</i>

# RESEARCH UNITS



## BIOPHARMACEUTICS

Prof Gerrit BORCHARD, PO  
Dr Olivier JORDAN, MER



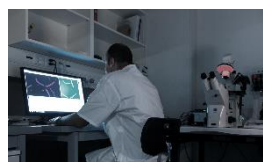
## IMMUNOPHARMACOLOGY OF CANCER

Prof Carole BOURQUIN, PO, (since 1.8.2016)



## ANALYTICAL SCIENCES

Prof Jean-Luc VEUTHEY, PO  
Prof Serge RUDAZ, PAS  
Dr Davy GUILLARME, CC  
Dr Julie SCHAPPLER, CE



## PHARMACEUTICAL BIOCHEMISTRY

Prof Leonardo SCAPOZZA, PO  
Prof Yogi KALIA, PAS  
Dr Remo PEROZZO, MER



## PHARMACEUTICAL TECHNOLOGIES

Prof Eric ALLEMANN, PO  
Prof Norbert LANGE, PAS  
Dr Florence DELIE, MER  
Dr. Pascal FURRER, CE



## PHARMACOGNOSY

Prof Muriel CUENDET, PAS  
Dr Philippe CHRISTEN, MER



## PHYTOCHEMISTRY & BIOACTIVE NATURAL PRODUCTS

Prof Jean-Luc WOLFENDER, PO  
Prof Miwa DOUNOUE, PI (since 1.9.2016)  
Dr Emerson FERREIRA-QUEIROZ, MER



## COMMUNITY PHARMACY

Prof Olivier BUGNON, PAS  
Dr Jérôme BERGER, CE



## CLINICAL PHARMACY

Prof Chantal CSAJKA, PAS  
Dr Monia GUIDI, CS



## PROTEOMIC CLINICAL

Prof Denis HOCHSTRASSER, PO



## CLINICAL PHARMACOLOGY

Prof Jules DESMEULES, PO



## HOSPITAL PHARMACY

Prof Pascal BONNABRY, PAS  
Prof Farshid SADEGHIPOUR, PT



## MOLECULAR PHARMACOLOGY

Prof Patrycja NOWAK, PAST, (since 1.6.2016)

# COMMITTEES OF THE SCHOOL OF PHARMACEUTICAL SCIENCES

## COMMITTEE FOR EDUCATION AND TEACHING PROGRAM

### **Prof Serge RUDAZ, President**

Prof Eric ALLEMANN  
Prof Gerrit BORCHARD  
Prof Carole BOURQUIN (since 01.09.2016)  
Prof Olivier BUGNON  
Prof Muriel CUENDET  
Prof Chantal CSAJKA  
Dr Florence DELIE-SALMON  
Prof Jules DESMEULES  
Dr Emerson FERREIRA QUEIROZ  
Dr Pascal FURRER  
Dr Davy GUILLARME  
Prof. Patrycja NOWAK (since 01.09.2016)  
Mrs Elena ONATE  
Dr Elisabeth RIVARA MINTEN  
Prof Farshid SADEGHIPOUR  
Prof Leonardo SCAPOZZA  
Dr Julie SCHAPPLER  
Dr Claudia A. SIMOES-PIRES  
Dr Emmanuel VARESIO  
Prof Jean-Luc VEUTHEY  
Prof Jean-Luc WOLFENDER

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Mrs Danielle COOSEMANS  
Prof Muriel CUENDET  
Dr Emerson FERREIRA QUEIROZ  
Dr Yogi KALIA

## CONTINUING EDUCATION PROGRAM AND PUBLIC

## COURSES COMMITTEE

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Prof Olivier BUGNON  
Mrs Karine HAAS (represent PharmaGeneva)  
Mrs Emilie REGINATO  
Dr Julie SCHAPPLER

## BUDGET COMMITTEE

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Prof Olivier BUGNON  
Prof Muriel CUENDET  
Mrs Annick de MORSIER  
Prof Leonardo SCAPOZZA

## SECURITY COMMITTEE

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Mrs Danielle COOSEMANS  
Dr Philippe CHRISTEN  
Mrs Annick de MORSIER  
Prof Norbert LANGE  
Mr Olivier PETERMANN  
Dr Elisabeth RIVARA-MINTEN  
Mr Cédric SCHELLING

## COMMITTEE REGULATIONS AND EQUIVALENCE

### **Prof Muriel CUENDET, President**

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## PREMISES COMMITTEE

### **Prof Eric ALLEMANN, president**

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Mrs Annick de MORSIER  
Mr Loris FRANCO  
Prof Leonardo SCAPOZZA  
Prof Jean-Luc VEUTHEY  
Prof Jean-Luc WOLFENDER

## NOTES, EXAMINATIONS AND DEROGATIONS COMMITTEE

### **Prof Jean-Luc WOLFENDER, President**

Prof Eric ALLEMANN  
Prof Olivier BUGNON  
Prof Muriel CUENDET  
Mrs Elena ONATE  
Dr Elisabeth RIVARA-MINTEN  
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## IT COMMITTEE

### **Prof Norbert LANGE, President**

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Mr Loris FRANCO  
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## DOCTORAL PROGRAM COMMITTEE

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Prof Leonardo SCAPOZZA  
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Prof Jean-Luc WOLFENDER

## SECONDARY EDUCATION COMMITTEE

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Mr Loris FRANCO  
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## SENIOR LECTURERS

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Thibaut DE SMEDT, *(since 1.3.2016)*  
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Beatrice KAUFMANN  
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Alice PANCHAUD  
Remo PEROZZO *(Promoted MER 1.8.2016)*  
Marie-Paule SCHNEIDER  
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## SENIOR RESEARCH AND TEACHING ASSISTANT

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Andrej BABIC *(until 31.7.2016)*

Laurence NEFF  
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Sebastien TARDY  
Magali ZEISSER

## EXCELLENCE FELLOWSHIPS

Adlin binti AFZAN  
Bandar ALGHANEM  
Imène ATEB

Vineetha CHELLAKUDAM  
Yosra ELLEMSI  
Si GOU

Somnath KANDEKAR  
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Vasundhara TYAGI

## RESEARCH AND TEACHING ASSISTANTS

Adlin AFZAN  
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Valentina D'ATRI  
Sergio DEL RIO SANCHO  
Carolina DOS SANTOS PASSOS

Amparo GARCIA LOPEZ  
Victor GONZALEZ RUIZ  
Alexandre GRAND-GUILLAUME  
Hisham HAMED  
Karolina JANIKOSWKA  
Damei KE  
Maria LAPTEVA  
Viorica PATRULEA  
Aurélie PERIAT

Marco RANDAZZO  
Stéphanie ROMAND  
Lionel SACCONNAY  
Omar SAKR  
Cesar SERNA JIMENEZ  
Daniel SPAGGIARI  
Cédric THAUVIN  
Narasimha UDA  
Andreja VUJICIC ZAGAR  
Chen-Ying YANG

## RESEARCH AUXILIARY

Sarah BRAITO (1.10.-31.12.2016)

Catherine DE HERDT (1.10 – 31.12.2016)

## CO-DIRECTIONS (CO-TUTELLES)

Akram FARHAT

Mélanie LELUBRE

Hanitra RAVELOJAONA

## ACADEMIQUE STUDENT

Aline DELLICOUR (1.7 – 31.10.2016)

Elsa OBERGFELL (1.10 – 31.12.2016)



## INTERNSHIP STUDENTS

Mohammad ABU DARWISH  
David ALVAREZ MARTINEZ  
Lucas ARAUJO  
Ken BROECKHOVEN  
Pierre-Eric CAMPOS  
Ilaria CIANCIBELLO  
Aline DELLICOUR

Virginie HOUBART  
Céline LEMOINE  
Helena MANNOCCIO RUSSO  
Thaïs MONTANHEIRO AMARAL  
Zahra MOTAMED  
Thanise NOGUEIRA FULLER  
Damien OLIVIER

Yanfei PENG  
André ROCHAIX  
Bettina SCHWARZ  
Barbara THEILER  
Chiara TORTIA  
Gamze VARAN

## ADMINISTRATIVE STAFF

Valérie CAZORLA (*until 31.3.2016*)  
Nathalie CHIAVAROLI (*since 1.4.2016*)  
Danielle COOSEMANS  
Annick de MORSIER  
Nicole DECREY

Nathalie GOFFIN (*since 1.2.2016*)  
Francisco MABIALA  
Elisa MASSON  
Elena ONATE  
Sylvia PASSAQUAY-RION

Natalie SCHREGLE  
Dominique STORZ (*until 31.5.2016*)  
Florence VON OW  
Anne-Françoise WITTA (*since 1.5.2016*)  
Axelle WIRTHNER (*commercial apprentice since 1.8.2014*)

## IT STAFF

Loris FRANCO

Yann MANET

Francisco MABIALA (auxiliary)

## TECHNICAL STAFF

Aurélie BAGUET  
Said BENOHOUD  
Frédéric BORLAT  
Nathalie BOULENS  
Carole DUPRAZ  
Samuel ESPY (*since 1.11.2016*)  
Christophe FRANCEY  
Aurélie GOUILLER

Sylvie GUINCHARD  
Tayeb JBILOU  
Béatrice KAUFMANN  
Sara LEONI (*Since 1.6.2016*)  
Laurence MARCOURT  
Aristea MASSARAS (*since 1.12.2016*)  
Xavier MELICH  
Jessica ORTELLI

Ophélie PATTHEY  
Marco PERDIGAO  
Olivier PETERMANN  
Barbara PINHEIRO (*since 15.7.2016*)  
Emilie REGINATO  
Colette SAUTY  
Cédric SCHELLING  
Emmanuelle SUBLET

# BUDGET

2016

2015

## \*SALARY AND OPERATIONAL

STAFF SALARY	11 712 254	12 022 125	(table 1)
OPERATIONAL BUDGET OF THE SECTION	1 180 411	1 182 411	(table 2)
<b>Total</b>	<b>12 892 665</b>	<b>13 204 536</b>	

\*With social security contributions including

## INVESTISSEMENT

FACULTY INVESTMENT	454 276	0*	*Report to 2016
SECTION INVESTMENT	290 979	260 155	
<b>Total</b>	<b>745 255</b>	<b>260 155</b>	(table 3)

## EXTERNALS FUNDS

SWISS NATIONAL SCIENCES FOUNDATION	1 729 865	730 581	
OTHERS FUNDS	3 210 085	3 012 084	
<b>Total</b>	<b>4 939 950</b>	<b>3 742 665</b>	(table 4)

**Total**

**18 577 870**

**17 207 356**

## STAFF

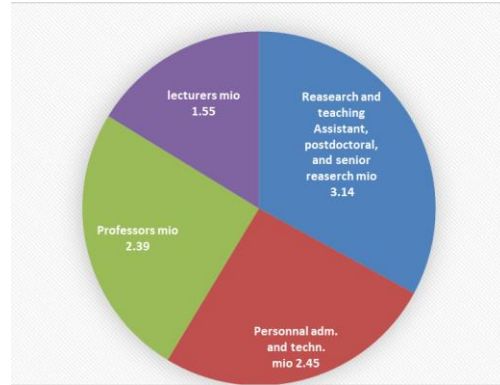
Number of people working at EPGL	230	226
<b>Total</b>	<b>230</b>	<b>226</b>

## PARTICIPATION OF ETAT DE VAUD

Contribution	5 004 976	5 075 407
<b>Total</b>	<b>5 004 976</b>	<b>5 075 407</b>

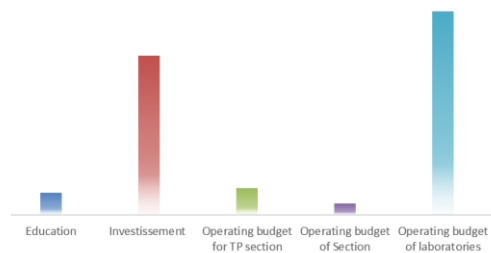
**TABLE 1 STAFF SALARY CHF 11'712'254**

- Assistants and postdoctorals : 134 persons
- Technical and administrative staff : 41 persons
- Lecturers : 37 persons
- Professors : 18 persons

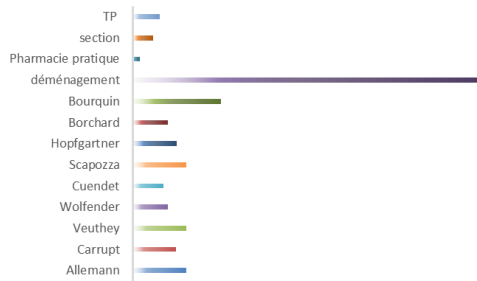


**TABLE 2 OPERATIONAL BUDGET OF THE SECTION CHF 1'180'411**

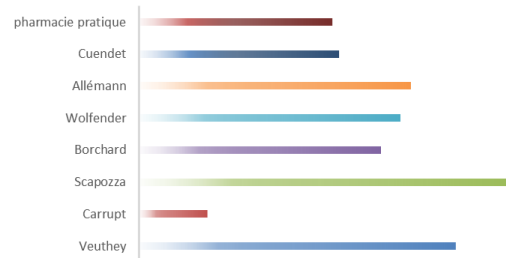
- Education budget chf 100'000
- Investment chf 745'255
- Operating budget TP chf 120'000
- Operating budget of Laboratories chf 912'411
- Operating budget of Administration section chf 50'000



**TABLE 3 TOTAL INVESTMENT FUNDS CHF 745'255**

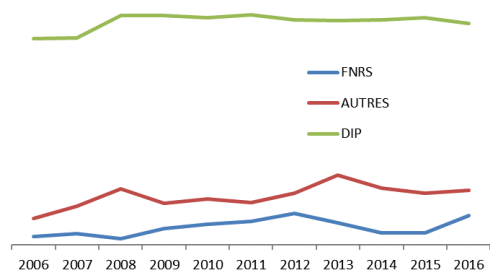


**OPERATIONAL BUDGET OF LABORATORIES CHF 912'411**



**TABLE 4 TOTAL PUBLIC AND EXTERNAL FUNDS CHF 4'939'950**

- FNRS chf 1'729'865
- Autres chf 3'210'085
- DIP chf 12'892'665



## 2016 AT A GLANCE

**TOTAL BUDGET CHF**

17.9 Mio

**TOTAL STUDENTS:**

**439**

- Bachelor

272

- Master

164

- Master of advanced studies

2

**PH.D. STUDENTS**

**87**

### SCIENTIFICS ACTIVITIES 2016

Publications with impact factor	190
Publications without impact factor	40
Books and chapters	18
Presentations & posters	185
Congress	159
Number of projects at FNRS and assimilated	28
Projects of collaboration with the industry	32
Ph.D. Thesis presented in 2016	21
Patents	4
Awards	24

### EVENTS

During summer 2016, the EPGL moved in the CMU. This transfer mobilized all collaborators of the School during several months.

The new building brings together under the same roof, several research groups of both Faculties of Sciences and Medicine. The new building offers a state of the art environment for education and research.

The inauguration took place on 24<sup>th</sup> november 2016, in presence of political, professional and societal stakeholders as well the public.

<https://www.unige.ch/public/actualites/2016/inauguration-cmu-5-6/>





## PROFESSOR GERRIT BORCHARD

### GENERAL DESCRIPTION OF THE UNIT

The Biopharmaceutics group (FABIO) of EPGL in 2016 is a multidisciplinary and international group dedicated to the study of interaction of drugs and drug carrier systems with their biological environment, especially the immune system. Scientific projects include the physicochemical characterization of such drugs and carriers, the optimization of formulation methods, the establishment of cell based-assays, the utilization of suitable ex-vivo and in-vivo models, and translational research to allow for clinical testing. FABIO has gained expertise in the treatment and prevention of infectious diseases through its work on vaccines, and has accumulated considerable knowledge in interventional cancer therapy. The former line of research is dedicated to the development of particle-based vaccines, which are equipped with novel adjuvants addressing the innate immune system (e.g., Toll-like and NOD-like receptors). Work in cancer therapy is focused on a superparamagnetic iron oxide nanoparticle (SPIONs) based combined approach of heat induction and chemotherapy, and on chemoembolization using (biodegradable) beads loaded with anti-angiogenic drugs. In addition, a program on the elucidation of critical quality attributes (CQA) driving the biodeposition of iron carbohydrate nanoparticles has been continued in 2016. More fundamental work is done in the area of drug interaction with the (innate) immune system. Here, we are attempting to elucidate the mechanisms underlying the inflammatory and immune response to aggregates of therapeutic proteins, especially observed after subcutaneous injection (injection site reactions, ISR). We have also recently unraveled the interplay of epithelial tight junction regulation and ligation of receptors of the innate immune system (e.g., Toll-like receptors). The Biopharmaceutics group has access to all equipment necessary for the execution of the projects described above, either in-house or through cooperation within EPGL, the University of Geneva or with outside partners. It entertains a multitude of cooperative projects with academic institutions (basic research and clinical) as well as with industrial partners. Through the active participation in various learned societies and scientific committees, FABIO has the opportunity to shape the future of biopharmaceutical sciences and science policies

### SPECIFIC RESEARCH FIELDS

#### Nanomedicine(s)

The application of nanotechnology has expanded the approach to drug delivery decisively. The formulation of drugs into nano-scale delivery systems offers specifically the opportunity to enhance specific interactions of nanoscale systems with the specific tissue or cell affected by the targeted disease ("drug targeting"). In this context, we are currently executing the following projects

#### 1. Targeting of prostate metastases

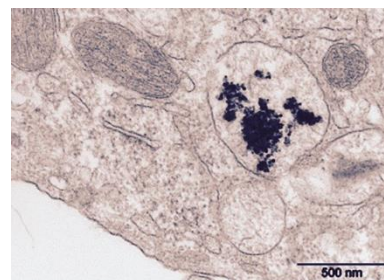
In the framework of a Swiss-wide Nanotera project we are developing superparamagnetic iron oxide nanoparticles (SPIONs), which are functionalized with an aptamer, small molecule and a mAb fragment directed against a prostate cancer antigen, PSMA. These nanoparticles aim at detecting cancer metastases by MR imaging and, ultimately, treat them through local hyperthermia. The project involves the particle synthesis, functionalization, physicochemical and in vitro characterization, and proof-of-concept in an animal model.

#### 2. Enhancing healing of chronic wounds

Together with specialists in wound healing at the CHUV Lausanne (Pr. Lee-Ann Applegate), microbiology (Dr. Karl Perron, University of Geneva), and peptide dendrimer chemistry (Pr. Jean-Louis Reymond, University of Berne) we are developing biopolymers and nanoparticulate formulations, which are functionalized with cell-guiding RGD peptides and/or microbicidal peptide dendrimers. Having successfully performed in vitro tests, we are now moving into proof-of-concept studies in an appropriate animal model.

3. Identifying critical quality attributes of therapeutic nanoparticles  
 Linking physicochemical properties of therapeutic nanoparticles (“critical quality attributes”) to the clinical outcome achieved is currently an intensely discussed subject at the level of regulatory authorities, the pharmacopoeias and on a fundamental level. FABIO is contributing to this discussion, partially through interactions with the US Food and drug Administration (FDA) and the European Directorate for the Quality of Medicine (EDQM) by developing assays for the testing of iron carbohydrate nanoparticles. A special focus is thereby the comparison of the innovator drugs (reference listed drugs, RLDs) with their intended copies, or “nanosimilars”.

Through these three project we are laying the basis for a more rational approach to the application of nanotechnology to drug delivery on the fundamental, clinical as well as the regulatory level.



Uptake of SPIONs functionalized with an anti-PSMA aptamer by androgen-sensitive human prostate adenocarcinoma cells (LNCaP) *in vitro*

## 2016 AT A GLANCE

Publications with impact factor	12
Publications without impact factor	3
Books and chapters	2
Posters presentations	15
Congresses and symposia	16
Number of projects at FNRS and assimilated	2
Projects of collaboration with the industry	3
PhD Thesis presented in 2016	1
Awards	2
Patents	1

## STAFF

### SENIOR LECTURER

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### POSTDOCTORAL SCHOLARS

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Franck MARQUET  
 Sakthikumar RAGUPATHY

### INTERNSHIP STUDENTS – CO-SUPERVISION

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 Thais Larissa DO AMARAL MONTANHEIRO (university of Sao Paulo, Brazil)

Céline LEMOINE (university of Leiden, The Netherlands)  
 Zara MOTAMED (Shiraz university of Medical Sciences, Theran, Iran)

### ADMINISTRATIVE STAFF

Valérie CAZORLA (until 31.3.2016)

Anne-Françoise WITTA (since 1.5.2016)

### TECHNICAL STAFF

Tayeb JBILOU

Emmanuelle SUBLET



## RESEARCH FUNDS

### SWISS RESEARCH PROGRAM SWISS RESEARCH PROGRAM

#### MAGNETOTHERANOSTICS

“From superparamagnetic nanoparticles until tools for the treatment of cancer” SNSF reference number: 20NA21\_145919

Co-investigators: O. JORDAN

Total funding : CHF 393'500.--

Allocation 2016: CHF 100'700.--

Duration: 4 years

Starting date: 01.04.2013

#### NOVEL MICELLAR DRUG CARRIER SYSTEMS FOR GENE THERAPIES

SNSF reference number: 200021\_157033

Co-Investigators: M. MOELLER, G. BORCHARD, A. Danani

Allocation 2016: CHF 95'000.--

Duration: 3 years

Starting date: 01.09.2015

### INDUSTRY AND ASSIMILATED

Code	Service - Development - Research	Total Amount for 2016 (CHF)
Aptissen	Research	21'139
Vifor	Research	201'488
Innogap fund	Research	30'000
	<b>total</b>	<b>252'627</b>

## PUBLICATIONS

### THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

Biomaterials	8.40
Journal of Controlled release	7.78
Nanomedicine : Nanotechnology, biology and Medicine	5.72
Expert Opinion on Drug Delivery	5.65
Carbohydrate Polymers	4.81
Molecular Pharmaceutics	4.44
European Journal of Pharmaceutics and Biopharmaceutics	4.15
Pharmaceutical Research	3.00
Journal of Pharmaceutical Sciences	2.71
Regulatory Toxicology and Pharmacology	2.22

### SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)

1. J.S.B. DE VLIJGER, G. BORCHARD, V.P. SHAH, B. FLÜHMANN, S. NEERVANNAN, S. MÜHLEBACH, Commentary to: The EU is ready for non-biological complex medicinal products by Falk Ehmann and Ruben Pita. *GaBi J.* 5 (2016) 101-102. doi: 10.5639/gabij.2016.0503.026. No IF yet
2. J. POECHEIM, C. BARNIER QUER, N. COLLIN, G. BORCHARD, Pharmaceutical and biological investigations of a nanoparticle-based DNA vaccine to enhance Th1 immune responses against tuberculosis. *Vaccines* 4 (2016) 32. doi:10.3390/vaccines4030032. 3.23
3. C. REICHERT, R. PEROZZO, G. BORCHARD, Non-covalent protein modification by coiled-coil technology. *Int. J. Pharm.* 511 (2016) 98-103. doi: 10.1016/j.ijpharm.2016.06.122. 3.64

- |     |   |           |
|-----|---|-----------|
| 4.  | G. BORCHARD, Complexity in the making: Non-biological complex drugs (NBCDs) and the pharmacopoeias. <i>GaBI J.</i> (2016) doi: 10.5639/gabij.2016.0501.XXX.   | No IF yet |
| 5.  | S. JESUS, E. SOARES, J. COSTA, G. BORCHARD, O. BORGES, Immune response elicited by an intranasally delivered HBsAg low-dose adsorbed to poly-ε-caprolactone based nanoparticles. <i>Int. J. Pharm.</i> 504 (2016) 59-69. doi: 10.1016/j.ijpharm.2016.03.013.  | 3.64      |
| 6.  | J. POECHEIM, V. PATRULEA, C. REICHERT, G. BORCHARD, Characterization of pDNA-TMC nanoparticle interaction and stability. <i>Current Drug Del.</i> 13 (2016) 301-308. doi: 10.2174/156720181303160520191305.   | 2.51      |
| 7.  | O. S. SAKR, S. BERNDT, G. CARPENTIER, M. CUENDET, O. JORDAN, G. BORCHARD, Arming embolic beads with anti-VEGF antibodies and controlling their release using LbL technology. <i>J. Control. Rel.</i> 224 (2016) 199-207. doi:10.1016/j.jconrel.2016.01.010.   | 7.78      |
| 8.  | V. PATRULEA, N. HIRT-BURRI, A. JEANNERAT, L. A. APPLGATE, V. OSTAFE, O. JORDAN, G. BORCHARD, RGDC peptide decorated chitosan derivatives enhance fibroblast adhesion and proliferation to promote wound healing. <i>Carbohydrate Polym.</i> 142 (2016) 114-123. doi: 10.1016/j.carbpol.2016.01.045.   | 4.81      |
| 9.  | C. REICHERT, G. BORCHARD, Non-Covalent PEGylation, an innovative subchapter in the field of protein modification. <i>J. Pharm. Sci.</i> 105 (2016) 386-390. doi: 10.1002/jps.24692.   | 2.71      |
| 10. | I. MYLONAKI, F. STRANO, S. DEGLISE, E. ALLÉMANN, F. ALONSO, J. M. CORPATAUX, C. DUBUIS, J. A. HAEFLIGER, O. JORDAN, F. SAUCY, F. DELIE. Perivascular sustained release of atorvastatin from a hydrogel-microparticle delivery system decreases intimal hyperplasia. <i>J Control Release.</i> 2016 Jun 28;232:93-102. doi: 10.1016/j.jconrel.2016.04.023. | 7.78      |
| 11. | P. BIZE, R. DURAN, K. FUCHS, O. DORMOND, J. NAMUR, L. A. DECOSTERD, O. JORDAN, E. DOELKER, A. DENYS. Antitumoral Effect of Sunitinib-eluting Beads in the Rabbit VX2 Tumor Model. <i>Radiology.</i> 2016 Aug;280(2):425-35. doi: 10.1148/radiol.2016150361.   | 7.29      |
| 12. | J. PRADAL, P. MAUDENS, C. GABAY, C. A. SEEMAYER, O. JORDAN, E. ALLÉMANN. Effect of particle size on the biodistribution of nano- and microparticles following intra-articular injection in mice. <i>Int J Pharm.</i> 2016 Feb 10;498(1-2):119-29. doi: 10.1016/j.ijpharm.2015.12.015.   | 3.64      |

## SCIENTIFIC PUBLICATIONS (WITHOUT IMPACT FACTOR)

1. K. FUCHS, A. KISS, P.E. BIZE, R. DURAN, A. DENYS, G. HOPFGARTNER, G. BORCHARD, O. JORDAN, Verteilung eines die Angiogenese hemmenden Wirkstoffs im Leberkarzinom von Kaninchen. *pharmaJournal* 24 (2016) 5-6.
2. B. FORBES, A. DANANI, G. BORCHARD, S. KASSINOS, Introducing European COST Action: 'SimInhale'. *Inhalation* (2016).
3. O. SAKR, O. JORDAN, G. BORCHARD, Layer by layer. *Medicine Maker* January 2016, 18-19.

## BOOKS CHAPTERS

1. S. TINKLE, S.E. MCNEIL, S. MÜHLEBACH, R. BAWA, G. BORCHARD, Y. BARENHOLZ, L. TAMARKIN, N. DESAI, Nanomedicines: Addressing the scientific and regulatory gap, in: R. Bawa (Editor), G. F. Audette and B. E. Reese. (Assistant Editors): *Handbook of Clinical Nanomedicine: Law, Business, Regulation, Safety and Risk*, Pan Stanford Publishing, Singapore (2016) [ISBN 978-981-4669-22-1 (Cloth), 978-981-4669-23-8 (eBook)], in press
2. J. POECHEIM, G. BORCHARD, Immunotherapy & Vaccines, in: J. Forcada, A. van Herk, G. Pastorin (eds.), *Controlled Release Systems: Advances in Nanobottles and active Nanoparticles*, Pan Stanford Publishing, (2016) 425-447

## PRESENTATIONS

### POSTERS PRESENTATIONS

1. S. EHRENBERGER, E. SUBLET, G. BORCHARD, O. JORDAN. "Targeted Nanoparticles for Imaging and Treatment of Prostate Cancer Metastases in Lymph Nodes" Nano-Tera annual meeting, Lausanne, Switzerland, April 25-26, 2016
2. S. EHRENBERGER, E. SUBLET, G. BORCHARD, O. JORDAN. "Aptamer Functionalized Iron Oxide Nanoparticles for Active Targeting of Prostate Cancer Metastases" European Summit of Clinical Nanomedicine and Targeted Medicine (CLINAM), Basel, Switzerland, June 27-29, 2016.
3. LUTFIJA, S. EHRENBERGER, G. BORCHARD, O. JORDAN. "Development of an Injectable Formulation Forming an Implant in Situ for the Treatment of Prostate Cancer" 9th Swiss Pharma Science Day, Bern, Switzerland, August 31, 2016.
4. S. EHRENBERGER, D. BONVIN, M. MIONIC, H. HOFMANN, G. BORCHARD, O. JORDAN. "Iron Oxide Nanoparticles for Detection and Treatment of Prostate Cancer Metastases" SFNano annual meeting, Paris, France, December 12-14, 2016.
5. T. DI FRANCESCO, G. BORCHARD. "Characterize Iron Sucrose using a dynamic light scattering procedure" 9th CLINAM Conference, European Foundation for Clinical Nanomedicine, Basel, Switzerland, June 26-29, 2016
6. T. DI FRANCESCO, G. BORCHARD. "Differential light scattering (DLS) for size measurement of iron sucrose: a validated method" 9th Swiss Pharma Science day, Bern, Switzerland, August 31st, 2016
7. T. DI FRANCESCO, L. DELAFONTAINE, G. BORCHARD. "Iron carbohydrate drugs case: are Maltofer® and their "generics" equivalent?". GRS16, Global Summit on Regulatory Science, Bethesda, MD, USA, September 7-9, 2016
8. T. DI FRANCESCO, G. BORCHARD "Tackling Iron Deficiency Anemia with Non-Biological Complex Drugs: Should we Expect Physicochemical Differences between Iron Sucrose and its Similar?" Equivalence of Complex Drug Products: Scientific and Regulatory Challenges, The New York Academy of Sciences, New York City, NY, November 9th, 2016
9. K. FUCHS, A. KISS, P.E. BIZE, R. DURAN, A. DENYS, G. HOPFGARTNER, G. BORCHARD, O. JORDAN "Mapping of Antiangiogenic Drug Distribution in a Rabbit Model of Liver Cancer by Fluorescence Microscopy and MALDI-SRM/MS Imaging". Controlled Release Society (CRS) Annual Meeting & Exposition. July 17-20, 2016, Seattle, Washington (US)
10. K. FUCHS, A. KISS, P.E. BIZE, R. DURAN, A. DENYS, G. HOPFGARTNER, G. BORCHARD, O. JORDAN. "Mapping of Antiangiogenic Drug Distribution in a Rabbit Model of Liver Cancer". 9th Swiss Pharma Science Day - August 31, 2016, Bern (Switzerland)
11. V. PATRULEA, L.A. APPELEGATE, V. OSTAFE, O. JORDAN, G. BORCHARD, " Wound healing through nano-complexes", Swiss Pharma Science Day 2016, August 31st, 2016 Bern (Switzerland)
12. V. PATRULEA, V. OSTAFE, L.A. APPELEGATE, G. BORCHARD, O. JORDAN, " Polyelectrolyte nanocomplexes based on chitosan derivatives for wound healing promotion ", The European Summit for Clinical Nanomedicine and Targeted Medicine (Clinam), June 26th-29th 2016 Basel (Switzerland)
13. V. PATRULEA, V. OSTAFE, L.A. APPELEGATE, G. BORCHARD, O. JORDAN, "Nano-sized Formulations Based on Chitosan Derivatives for Wound Healing Promotion", Swiss Burn and Wound Symposium, May 12th-13th 2016 Lavey-les-Bains (Switzerland)
14. V. PATRULEA, V. OSTAFE, L.A. APPELEGATE, G. BORCHARD, O. JORDAN. " Nanoparticles and gels based on new chitosan derivatives for wound healing promotion", 11th International Conference and Workshop on Biological Barriers (BioBarriers), March 7-9, 2016 Saarbrücken (Germany)
15. F. GROELL, O. JORDAN, G. BORCHARD. Therapeutic Protein Injection: Dendritic Cells Embedded in Hydrogels to Mimic Human Immune Subcutaneous Environment" Swiss Pharma Sciences Day, Bern, august 31, 2016.

## CONGRESSES & SYMPOSIA

1. G. BORCHARD, Nanocarriers for DNA vaccination against *M. tuberculosis* GPEN, University of Kansas, Lawrence KS, USA, November 2016.
2. G. BORCHARD, Application of nano-sized vectors for vaccine delivery. Innovative adjuvanted influenza vaccines, Project Kick-off Meeting University of Lausanne, Epalinges, Switzerland, October 2016.
3. G. BORCHARD, Ensuring the quality and safety of complex drugs: the European Pharmacopoeia. 2<sup>nd</sup> International Symposium on Scientific and Regulatory Advances in Complex Drugs (SRACD 2016), Margaret Island, Budapest, Hungary, October 2016.
4. G. BORCHARD, Controlled release of therapeutic protein drugs using layer-by-layer technology. 18<sup>th</sup> Inter-national Pharmaceutical Technology Symposium IPTS, Antalya, Turkey, September 2016.
5. G. BORCHARD, Compendial initiatives for non-biological complex drugs (NBCDs). 9<sup>th</sup> CLINAM European Summit for Clinical Nanomedicine and Targeted Medicine, Basel, Switzerland, June 2016.
6. G. BORCHARD, An EDQM view on characterization of non-biological complex drugs. First Asia-Pacific Roundtable on Non-Biological Complex Drugs - Regulatory Assessment Principles, Siem Reap, Cambodia, May 2016.
7. G. BORCHARD, A brief introduction to Non-Biologic Complex Drugs (NBCDs). Roundtable, Challenges in the Assessment and Use of Non Biological Complex Drugs, Beijing, China, May 2016.
8. G. BORCHARD, Non-biological complex drugs (NBCDs): Details do matter. The Forbidden City International Pharmacists Forum, Beijing, China, May 2016.
9. G. BORCHARD, How to keep tight junctions tight (and how not). Leopold-Franzens-Universität Innsbruck, Innsbruck, Austria, April 2016.
10. G. BORCHARD, Regulation of epithelial permeability: Addressing the innate immune system. 11<sup>th</sup> International Conference and Workshop on Biological Barriers, Saarland University, Saarbrücken, Germany, March 2016.
11. G. BORCHARD, The biology of drug targeting. / Targeting strategies. / Antibody-drug conjugates. / Nanopharmaceuticals. International Masterclass on Targeted Drug Delivery. Basel, Switzerland, February 2016.
12. G. BORCHARD, Regulation for nanoparticles in medical use. 2016 CCMX Winter School on "Nanoparticles: from Fundamentals to Applications in Life Sciences", Kandersteg, Switzerland, February 2016.
13. G. BORCHARD, Non-biological complex drugs: Activities. United States Pharmacopoeia (USP), Bethesda, MD, USA, January 2016.
14. S. EHRENBERGER, Targeted Iron Oxide Nanoparticles for Detection of Lymph Node Metastases. Swiss Galenic meeting, Zurich, Switzerland, September 2016.
15. T. DI FRANCESCO, L. DELAFONTAINE, G. BORCHARD, Maltofer® vS. iron polymaltose similars: could we spot differences?" 11<sup>th</sup> Globalization of Pharmaceutics Education Network (GPEN) Conference, Lawrence, KS, USA, November 2016.
16. F. GROELL, The birth, life and death of a therapeutic protein. Swiss Galenic meeting, Zurich, Switzerland, September 2016.

## CONTINUING EDUCATION & OPEN TO THE PUBLIC LECTURES

1. G. BORCHARD, Risk Assessment und Regulierungen für die Sicherheit der Nanomedizin. World Nano Cancer Day, Zurich, Switzerland, February 2016.
2. G. BORCHARD, Apothekerausbildung in der Schweiz. Klausurtagung Landesapothekerkammer Hessen, Frankfurt, Germany, March 2016.

## THESIS PRESENTED

### INTRA-MUROS THESIS

Katrin FUCHS,  
*Anti-angiogenic strategies for chemoembolization of liver tumors*  
University of Geneva  
Thesis N° 5010, October 2016  
Directors : G. BORCHARD and O. JORDAN,

### EXTRA-MUROS THESIS

Sandra Cristina CAMPOS DE JESUS,  
Co-delivery of a pDNA hepatitis B vaccine with heat shock protein (Hsp) 70 using chitosan-based nanocarriers: Design of a mucosal formulation and mechanistic studies  
Cooperation with prof. Olga BORGES, University of Coimbra, Portugal,

## PATENTS

S. RAGUPATHY, G. BORCHARD. Peptidic protein kinase C inhibitors and uses thereof. EP Patent application No. 16203107.4, December 9, 2016.

## AWARDS & DISTINCTIONS

3<sup>rd</sup> Poster Award, 9<sup>th</sup> Swiss Pharma Science Day, Berne, Switzerland, August 2016 (K. FUCHS).

Prize for the best master thesis in industry 2016 within the section of Pharmaceutical Sciences at the University of Geneva, awarded by the Swiss Society of Industrial Pharmacists (SSIP) (Albulena Lutfija).

# IMMUNOPHARMACOLOGY OF CANCER



## PROFESSOR CAROLE BOURQUIN (SINCE 1.8.2016)

### GENERAL DESCRIPTION OF THE UNIT

Our overall aim is to develop novel treatments to enhance the body's immune defenses against cancer. Our research aims first at uncovering new mechanisms leading to activation of the immune system, for example during viral infections. Using this bioinspiration, our goal is to develop pharmacological ways to stimulate anticancer immunity. We are currently working on the following questions:

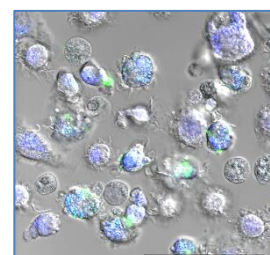
- What is the early sequence of immune activation during a viral infection? How can we reproduce this sequence pharmacologically?
- How do virally-derived components, such as Toll-like receptor ligands, activate anti-cancer immunity and decrease cancer-associated immunosuppression?
- Can we enhance migration of effector T cells into the tumor with virally-derived components?
- Can we use nanoparticles as delivery system to focus their action and prevent unwanted side effects?

### SPECIFIC RESEARCH FIELDS

Impact of virally-derived components in anti-tumoral immune responses and lymphocyte migration

Design of tumor-targeted immunostimulatory nanoparticles (TiNaps)

Tumor and immune cell metabolism: their interplay for the development of tumor-related immune responses



Nanoparticles (green) taken up by macrophages

### 2016 AT A GLANCE

Publications with impact factor	4
Posters presentations	12
Congresses and Symposia	6
Number of projects at FNRS and assimilated	4
Projects of collaboration with the industry	2
Awards	3



## STAFF

<b>POSTDOCTORAL SCHOLARS</b>	Narasimha Rao UDA	Chen-Ying YANG
<b>RESEARCH AND TEACHING ASSISTANTS</b>	Sandra HOCEVAR Inès MOTTAS Jean-Baptiste PIGNIER	Lorenzo SPAGNUOLO Julia WAGNER
<b>MASTER STUDENTS</b>	Alessandra CEREGHETTI	
<b>ADMINISTRATIVE STAFF</b>	Nathalie CHIAVAROLI	
<b>TECHNICAL STAFF</b>	Aristea MASSARAS	

## RESEARCH FUNDS

### SWISS NATIONAL SCIENCE FOUNDATION

“Understanding the interaction of nanoparticles with B lymphocytes in vitro and in vivo”.

310030\_156871/1

Main applicant : C. BOURQUIN

Co-applicant : M. Clift, University of Wales

Total funding : CHF 397'000.--

Allocation 2016 : CHF 105'000.--

Duration : 3 years

Starting date : 2015

### SWISS NATIONAL SCIENCE FOUNDATION

“RLR/TLR combination therapy: Mechanisms of T-cell recruitment into gastric tumors” 310030\_156372/1

Main applicant : C. BOURQUIN

Total funding : CHF 550'000.—

Duration : 3 years

Starting date : 2015

### NATIONAL CENTER OF COMPETENCE IN RESEARCH – BIO-INSPIRED MATERIALS

“Controlled activation of cancer-associated immune cells by stimuli-responsive nanoparticles”

Main applicant : Ch. Weder

Co-applicants : M. Borkovec, C. BOURQUIN, J. Brader, N. Bruns, A.S. Fink, K.M. Fromm, A.F.M. Kilbinger, M. Lattuada, B. Rothen-Rutishauser, C.R. Rüegg, F. Scheffold, F. Stellacci, A.R. Studart

Total funding (BOURQUIN project): CHF 295'000.—

Allocation 2016 : CHF 73'750.—

Duration : 4 years

Starting date : 2014

### HORIZON 2020 MARIE SKLODOWSKA-CURIE ACTION INNOVATIVE TRAINING NETWORK

“IMMUTRAIN - Training Network for the Immunotherapy of Cancer”. Grant Agreement n° 641549 (Swiss participation funded by SEFRI to C. BOURQUIN)

Coordinator: Ludwig-Maximilians-Universität München

Co-applicants: Stichting Katholieke Universiteit, The Netherlands, Roche Diagnostics, Germany, The Nottingham Trent University, United Kingdom, Istituto Europeo di Oncologia, Italy, Medizinische Universität Innsbruck, Austria, Fundacion Centro Nacional de Investigaciones Oncologicas Carlos III, Spain, Region Hovedstaden, Denmark, Institut Gustave Roussy, France, Université de Genève, Switzerland

Total funding (BOURQUIN project): CHF 334'310.—

Allocation 2016 : CHF 167'155.--

Duration : 4 years

Starting date : 2015

## PUBLICATIONS

### THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

Cancer Cell	23.00
Nature Immunology	23.00
Immunity	22.00
Clinical Cancer Research	8.70
Cancer Research	8.50
Nanoscale	7.80
Oncoimmunology	7.60
Cancer Immunology Research	6.70
Oncotarget	6.30
Journal of Immunology	5.30

### SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)

1. C. HOTZ, M. TREINIES, I. MOTTAS I, L.-C. RÖTZER, A. OBERSON, L. SPAGNUOLO, M. PERDICCHIO, T. SPINETTI, T. HERBST, C. BOURQUIN: "Reprogramming of TLR7 signaling enhances antitumor NK and cytotoxic T cell responses". *Oncoimmunology*. 5 (2016):e1232219. 7.60
2. T. SPINETTI, L. SPAGNUOLO, I. MOTTAS, C. SECONDINI, M. TREINIES, C. RÜEGG, C. HOTZ, C. BOURQUIN: "TLR7-based cancer immunotherapy decreases intratumoral myeloid-derived suppressor cells and blocks their immunosuppressive function". *Oncoimmunology*. 5 (2016):e1230578. 7.60
3. S. HEIDEGGER, D. GÖBL, A. SCHMIDT, S. NIEDERMAYER, C. ARGYO, S. ENDRES, T. BEIN, C. BOURQUIN: "Immune response to functionalized mesoporous silica nanoparticles for targeted drug delivery". *Nanoscale*. 8 (2016):938-48. 7.80
4. M. PICCAND, J. BESSA, E. SCHICK, C. SENN, C. BOURQUIN, WF. RICHTER: "Neonatal Immune Tolerance Induction to Allow Long-Term Studies With an Immunogenic Therapeutic Monoclonal Antibody in Mice". *AAPS J.* 18 (2016):354-61. 3.80

## PRESENTATIONS

### POSTERS PRESENTATIONS

1. N. R. UDA, C. BOURQUIN: "Effect of tumor lipid metabolism on the efficacy of cancer immunotherapy". 4<sup>th</sup> ProDoc CellMigration Retreat, 27-29 October 2016, Gunten (Switzerland).
2. J. WAGNER, I. MOTTAS, J. WIDMER, D. GÖBL, T. BEIN, C. BOURQUIN: "Improving Cancer Immunotherapy with STING ligands". 4<sup>th</sup> ProDoc CellMigration Retreat, 27-29 October 2016, Gunten (Switzerland).
3. L. SPAGNUOLO, N. BOSS, T. SPINETTI, C. HOTZ, M. UGUCCIONI, C. BOURQUIN: "HMGB1/CXCL12 synergy enhances B-lymphocyte migration". WIRM X-2016, 16-19 March 2016, Davos (Switzerland).
4. L. SPAGNUOLO, N. BOSS, T. SPINETTI, C. HOTZ, M. UGUCCIONI, C. BOURQUIN: "HMGB1/CXCL12 synergy enhances lymphocyte migration". Joint SSORL / SSAI Meeting 2016, 28-29 April 2016, Montreux (Switzerland).
5. L. SPAGNUOLO, N. BOSS, T. SPINETTI, C. HOTZ, M. UGUCCIONI, C. BOURQUIN: "HMGB1/CXCL12 synergy enhances lymphocyte migration". 14<sup>th</sup> CIMT Annual Meeting, 10-12 May 2016, Mainz (Germany).
6. S. HOCEVAR, A. MILOSEVIC, A. PETRI FINK, B. ROTHEN RUTISHAUSER, C. BOURQUIN, M.J.D. CLIFT: "Understanding the impact of Au nanoparticle surface chemistry on primary human B-lymphocytes *in vitro*". 4<sup>th</sup> ProDoc CellMigration Retreat, 27-29 October 2016, Gunten (Switzerland).

7. I. MOTTAS, A. BEKDEMIR, L. SPAGNUOLO, A. CEREGHETTI, F. STELLACCI, C. BOURQUIN: "Nanoparticles as carrier for immuno-stimulating drugs for cancer therapy", 4<sup>th</sup> ProDoc CellMigration Retreat, 27-29 October 2016, Gunten (Switzerland).
8. I. MOTTAS, A. BEKDEMIR, L. SPAGNUOLO, A. CEREGHETTI, F. STELLACCI, C. BOURQUIN: "Mixed ligand-coated gold nanoparticles as carrier of resiquimod for cancer immunotherapy", 5-9 September 2016, Molecular Therapeutics - Discovery, development and delivery, Zermatt (Switzerland).
9. I. MOTTAS, A. BEKDEMIR, L. SPAGNUOLO, A. CEREGHETTI, F. STELLACCI, C. BOURQUIN: "Mixed ligand-coated gold nanoparticles as carrier of R848 for cancer immunotherapy", Annual Center Conference 2016 of the NCCR Bio-Inspired Materials, 2-3 June 2016, Charmey (Switzerland).
10. I. MOTTAS, A. BEKDEMIR, L. SPAGNUOLO, A. CEREGHETTI, F. STELLACCI, C. BOURQUIN: "Mixed ligand-coated gold nanoparticles as carrier of R848 for cancer immunotherapy". 14<sup>th</sup> Cancer Immunotherapy (CIMT) meeting, 11-13 May 2016, Mainz (Germany).
11. I. MOTTAS, A. BEKDEMIR, L. SPAGNUOLO, A. CEREGHETTI, F. STELLACCI, C. BOURQUIN: "Gold nanoparticles to mimic viral infection". NCCR Bio-Inspired Materials site visit 2016, 28-29 April 2016, Fribourg (Switzerland).
12. I. MOTTAS, A. BEKDEMIR, L. SPAGNUOLO, A. CEREGHETTI, F. STELLACCI, C. BOURQUIN: "Nanoparticle as carrier of immune-activating drugs". 5<sup>th</sup> research day, 13 March 2016, Fribourg (Switzerland).

## CONGRESSES & SYMPOSIA

1. C. BOURQUIN: "Immunostimulation for cancer therapy: timing is everything" German Pharm-Tox Summit 2016, Berlin (Germany).
2. C. BOURQUIN: "Reprogramming innate immune signalling to improve cancer immunotherapy", Immunofest 2016, Munich (Germany).
3. L. SPAGNUOLO, N. BOSS, T. SPINETTI, A. OBERSON, J. WIDMER, I. MOTTAS, C. HOTZ, M.E. BIANCHI, M. UGUCCIONI, C. BOURQUIN: "HMGB1/CXCL12 synergy enhances B lymphocyte migration and promotes B-cell egress from Peyer's patches". HMGB1 workshop, 13-14 October 2016, Milan (Italy).
4. L. SPAGNUOLO: "Chemokine synergy in lymphocytes migration: role of HMGB1/CXCL12 complex". 4th ProDoc CellMigration Retreat, 27-29 October 2016, Gunten (Switzerland).
5. I. MOTTAS, A. BEKDEMIR, L. SPAGNUOLO, A. CEREGHETTI, F. STELLACCI, C. BOURQUIN: "Mixed ligand-coated gold nanoparticles as carrier of R848 for cancer immunotherapy". Spring meeting of the Swiss society of pharmacology and toxicology, 21 April 2016, Bern (Switzerland).
6. I. MOTTAS: "Nanoparticle uptake by cells: flow cytometry vs. fluorescent microscopy". Imaging Techniques Workshop organized by scientific program SCOPES, 25-27 January 2016, Fribourg (Switzerland).

## THESIS PRESENTED

### THESIS JURY

Christoph WYSS

"Cellular and Molecular Mechanisms of Breast Cancer Metastasis to the Brain"

Supervisor: Prof. C. Rüegg, University of Fribourg,

Jury member: C. BOURQUIN

## AWARDS & DISTINCTIONS

L. SPAGNUOLO : Travel grant award, 14<sup>th</sup> CIMT Annual Meeting, 10-12 May 2016, Mainz (Germany).

Best poster: I. MOTTAS, A. BEKDEMIR, L. SPAGNUOLO, A. CEREGHETTI, F. STELLACCI, C. BOURQUIN: "Mixed ligand-coated gold nanoparticles as carrier of R848 for cancer immunotherapy". 5-9 September 2016, Molecular Therapeutics - Discovery, development and delive, Zermatt (Switzerland).

Best poster: I. MOTTAS, A. BEKDEMIR, L. SPAGNUOLO, A. CEREGHETTI, F. STELLACCI, C. BOURQUIN: "Nanoparticle as carrier of immune-activating drugs". 5<sup>th</sup> research day, 13 march 2016, Fribourg (Switzerland).



## PROFESSOR SERGE RUDAZ

## PROFESSOR JEAN-LUC VEUTHEY

### GENERAL DESCRIPTION OF THE UNIT

The group focuses its activities on separation techniques mainly liquid chromatography (LC), capillary electrophoresis (CE) and supercritical fluid chromatography (SFC) coupled with various detectors, including mass spectrometry (MS) for the analysis and bioanalysis of pharmaceutical and biopharmaceutical compounds. New chromatographic supports and sample preparation approaches are evaluated and original strategies to gain selectivity and/or sensitivity of the analytical process are developed. Reduction of the total analysis time is also studied. Special focus is given to environmentally friendly analytical techniques (green chemistry). The research of this group also focuses on the development and the use of methods for mathematical and statistical analysis of data produced from chemical instrumentation. The use of chemometric tools for developing analytical methods, determining optimized or robust conditions, as well as for analyzing data with pattern recognition techniques are applied in many projects within the School of Pharmaceutical Sciences and numerous external academic and/or industrial collaborations. Three main fields are currently developed, namely Design of experiments (DOE), method validation, and data mining (exploratory data analysis). For the latter, numerous important collaborations are under progress, particularly in the field of metabolism, metabolomics, and toxicology.

Research areas consist in:

- ✚ pharmaceutical and drugs of abuse analysis
- ✚ doping substances analysis
- ✚ chiral separation of pharmaceutical products
- ✚ study of the impact of sample preparation procedures in the analytical process
- ✚ characterization of large biomolecules (proteins, mAbs, ADC's)
- ✚ biomedical analysis
- ✚ drug metabolism
- ✚ affinity chromatography
- ✚ UHPLC, CE and SFC
- ✚ separation techniques
- ✚ screening method for metabolomic purpose
- ✚ data mining

### SPECIFIC RESEARCH FIELDS

- Liquid chromatography (LC)
- Capillary electrophoresis (CE)
- Supercritical fluid chromatography (SFC)
- Hyphenation to mass spectrometry (MS)
- Validation
- Sample preparation
- Chemometrics
- Toxicology
- Metabolomics

## 2016 AT A GLANCE

Publications with impact factor	43
Publications without impact factor	6
Book and chapters	4
Posters presentations	43
Congresses & Symposia	26
Number of projects at FNRS and assimilated	1
Projects of collaboration with the industry	4
Ph.D. Thesis presented in 2016	3
Awards	10

## STAFF

<b>SENIOR LECTURER</b>	Davy GUILLARME	
<b>LECTURER</b>	Julie SCHAPPLER	
<b>VISITING PROFESSORS</b>	Ken BROEKHOVEN	Frédéric ZENHAUSERN
<b>EXCELLENCE FELLOWSHIP</b>	Virginie HOUBART	
<b>SENIOR RESEARCH ASSOCIATE</b>	Julien BOCCARD Szabolcs FEKETE	Fabienne JEANNERET
<b>FELLOWSHIP</b>	Aline DELLICOURT	
<b>POSTDOCTORAL SCHOLARS</b>	Balazs BOBALY Valentina D'ATRI Victor GONZALEZ-RUIZ Alexandre GRAND-GUILLAUME PERRENOUD	Aurélie PERIAT Marco RANDAZZO Dany SPAGGIARI David TONOLI
<b>RESEARCH AND TEACHING ASSISTANTS</b>	Vincent DESFONTAINE Nicolas DROUIN Yoric GAGNEBIN	Alexandre GOYON Stéphanie ROMAND Julian PEZZATTI
<b>INTERNSHIP STUDENTS – CO-SUPERVISION (CO-TUTELLE)</b>	Leire AZURMENDI El-Hadji Assan DIOP Nicola GUICHARD Ameena JESAIMANI	Linnéa LAGERSTEDT Niloufar MARSOUSI Federico PONZETTO
<b>ADMINISTRATIVE STAFF</b>	Nicole DECREY	Sylvia PASSAQUAY
<b>TECHNICAL STAFF</b>	Christophe FRANCEY Etienne JACOT-DESCOMBES <i>(apprentice laborant)</i>	Emilie REGINATO Cédric SCHELLING



## RESEARCH FUNDS

### SCAHT

Swiss Center for Applied Human Toxicology (SCAHT). An untargeted steroidomic approach for toxicological studies. In core project: Endocrine disruptors and steroid modulation.

Main Applicant: S. RUDAZ

Total funding: CHF 570'000.-

Allocation 2016: CHF. 190'000.-

Duration : 3 years

Starting date: 01.01.2014

Method development for the analysis of small polar metabolites as key event for the adverse outcome neuroinflammation.

Main Applicant: S. RUDAZ

Total funding : CHF. 63'470.-

Duration : 01.11.2016-31.12.2016

### NESTLE

Evaluation of SFC for the characterization of natural products.

Main applicant : J.-L. VEUTHEY

co-applicant : Dr D. GUILLARME

Total funding : CHF 657'956

Allocation 2016 : CHF 180'778

Duration : 3 years

Starting date : 01.09.2014

### FIRMENICH

Nature-Identical Taste Modifiers. Collaboration with prof. J.-L. WOLFENDER

Main applicant : J.-L. WOLFENDER

Co-applicant : S. RUDAZ

Total funding : CHF 158'000

Allocation 2016 : CHF 130'000

Duration : 3 years

Starting date : 01.01.2015

### FNRS

Improving the analytical strategies for the characterization of monoclonal antibodies, biosimilars and antibody-drug conjugates.

Main applicant: D. GUILLARME

Co-applicant : J.-L. VEUTHEY

Total funding: CHF 441'600.-

Allocation 2016: CHF 147'200.-

Duration: 3 years

Starting date: 11.01.2016

## INDUSTRY AND ASSIMILATED

Code	Service - Development - Research	Total Amount for 2016 (CHF)
Teoxane SA Geneva-Switzerland	Service – Analytical investigations and dosages	82'128
ULG Labo Green	Service – analytical investigatin and dosages	3'314
Debiopharm	Service – analytical investigations and dosages	1'064
Nestec	Contrat de prestations	30'715
COV Taxes	taxes	1'796
	<b>total</b>	<b>119'017</b>

## DEVICES IN LEND

DEVICE	ENTERPRISE /LABORATORY	LENDING PERIOD	LOCALISATION	INSURANCE CONTRAT
UPLC (DAD) (110'000 Chf.)	AGEMEL	since 24.03.2010	B09.1513A	Non
HPLC Waters Série 1500 (50'000 Chf.)	AGEMEL	since 18.05.2011	B09.1513A	Non
G7100 Series Capillary Eletrophoresis with CE-MS interfact kit (90'000 Chf.)	AGILENT	since 05.05.2010	B09.2220A	Oui
Agilent technologies G1310A 1200 series isocratic pump (20'000 Chf.)	AGILENT	since 15.05.2010	B09.2220A	Non
APPI Spray Chamber (50'000 Chf.)	AGILENT	since 01.11.2013	B09.2220A	Non

## PUBLICATIONS

### THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

Anal Chem	5.88
Sciences. Rep	5.22
Analytica Chimica Acta	4.51
Analyst	4.03
J. Chromatography A	3.92
Eur. J. Pharm. Sci.	3.77
J. Nat. Prod.	3.66
Toxicol. Letters	3.52
J. Pharm. Biomed. Anal	3.16
Anal. Bioanal. Chem	3.12

### SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)

1. M. RODRIGUEZ-ALLER, A. BECK, D. GUILLARME, S. FEKETE. Practical method development for the separation of monoclonal antibodies and antibody-drug-conjugate species for hydrophobic interaction chromatography, part 1: optimization of the mobile phase. *J. Pharm. Biomed. Anal.*, 118 (2016) 393-403. 3.16
2. R. NICOLI, D. GUILLARME, N. LEUENBERGER, N. BAUME, N. ROBINSON, M. SAUGY, J.-L. VEUTHEY. Analytical strategies for doping control purposes: needs, challenges and perspectives. *Anal. Chem.*, 88 (2016) 508-523. 5.88
3. S. FEKETE, D. GUILLARME, P. SANDRA, K. SANDRA. Chromatographic, Electrophoretic and Mass Spectrometric Methods for the Analytical Characterization of Protein Biopharmaceuticals. *Anal. Chem.*, 88 (2016) 480-507. 5.88
4. S. FEKETE, M. RODRIGUEZ-ALLER, A. CUSUMANO, R. HAYES, H. ZHANG, T. EDGE, J.-L. VEUTHEY, D. GUILLARME. Prototype sphere-on-sphere silica particles for the separation of large biomolecules. *J. Chromatogr. A*, 1431 (2016) 94-102. 3.92
5. A. CUSUMANO, D. GUILLARME, A. BECK, S. FEKETE. Practical method development for the separation of monoclonal antibodies and antibody-drug-conjugate species in hydrophobic interaction chromatography, part 2: optimization of the phase system. *J. Pharm. Biomed. Anal.*, 121 (2016) 161-173. 3.16
6. S. ROMAND, S. RUDAZ, D. GUILLARME. Separation of substrates and closely related glucuronide metabolites using various chromatographic modes. *J. Chromatogr. A*, 1435 (2016) 54-65. 3.92

7. V. DESFONTAINE, J.L. VEUTHEY, D. GUILLARME. Evaluation of innovative stationary phase chemistries and analytical conditions for the analysis of basic drugs by supercritical fluid chromatography. *J. Chromatogr. A*, 1438 (2016) 244-253. 3.92
8. A. PERIAT, I. KOHLER, A. THOMAS, R. NICOLI, J. BOCCARD, J.L. VEUTHEY, J. SCHAPPLER, D. GUILLARME. Systematic evaluation of matrix effects in hydrophilic interaction chromatography versus reversed phase liquid chromatography coupled to mass spectrometry. *J. Chromatogr. A*, 1439 (2016) 42-53. 3.92
9. L. NOVAKOVA, V. DESFONTAINE, F. PONZETTO, R. NICOLI, M. SAUGY, J.-L. VEUTHEY, D. GUILLARME. Fast and sensitive supercritical fluid chromatography - tandem mass spectrometry multi-class screening method for the determination of doping agents in urine. *Anal. Chim. Acta*, 915 (2016) 102-110. 4.51
10. G.M. RANDAZZO, D. TONOLI, S. HAMBYE, D. GUILLARME, F. JEANNERET, A. NURISSO, L. GORACCI, J. BOCCARD, S. RUDAZ. Prediction of retention time in reversed-phase liquid chromatography as a tool for steroid identification. *Anal. Chim. Acta*, 916 (2016) 8-16. 4.51
11. A. PERIAT, S. FEKETE, A. CUSUMANO, J.-L. VEUTHEY, A. BECK, M. LAUBER, D. GUILLARME. Potential of Hydrophilic Interaction Chromatography for the Analytical Characterization of Protein Biopharmaceutical. *J. Chromatogr. A*, 1448 (2016) 81-92. 3.92
12. M. MIGNOT, A. PERIAT, V. PEULON-AGASSE, P. CARDINAE, J.-L. VEUTHEY, D. GUILLARME. Evaluation of thermally pretreated silica stationary phases under hydrophilic interaction chromatography conditions. *J. Sep. Sci.*, 39 (2016) 1611-1618. 2.74
13. A. GRAND-GUILLAUME PERRENOUD, D. GUILLARME, J.-L. VEUTHEY, D. BARRON, S. MOCO. Ultra-high Performance Supercritical Fluid Chromatography coupled with quadrupole-Time-of-Flight mass spectrometry as a performing tool for bioactive analysis. *J. Chromatogr. A*, 1450 (2016) 101-111. 3.92
14. V. DESFONTAINE, L. NOVAKOVA, F. PONZETTO, R. NICOLI, M. SAUGY, J.-L. VEUTHEY, D. GUILLARME. Liquid chromatography and supercritical fluid chromatography as alternative techniques to gas chromatography for the rapid screening of anabolic agents in urine. *J. Chromatogr. A*, 1451 (2016) 145-155. 3.92
15. A. AZZOLLINI, Q. FAVRE-GODAL, J. ZHANG, L. MARCOURT, S. N. EBRAHIMI, S. WANG, P. FAN, H. LOU, D. GUILLARME, E. FERREIRA QUEIROZ, J.-L. WOLFENDER. Large scale MS-guided isolation of bioactive natural products using high resolution flash chromatography: antifungal agents from *Chiloscyphus polyanthos* as a case study. *Planta Med.*, 82 (2016) 1051-1057. 1.99
16. B. BOBALY, A. BECK, J.-L. VEUTHEY, D. GUILLARME, S. FEKETE. Impact of organic modifier and temperature on protein denaturation in hydrophobic interaction chromatography. *J. Pharm. Biomed. Anal.*, 131 (2016) 124-132. 3.16
17. M. RODRIGUEZ-ALLER, A. CUSUMANO, A. BECK, D. GUILLARME, S. FEKETE. Importance of vial shape and type on the reproducibility of size exclusion chromatography measurement of monoclonal antibodies. *J. Chromatogr. B*, 1032 (2016) 131-138. 2.68
18. M. SARRUT, A. CORGIER, S. FEKETE, D. GUILLARME, D. LASCoux, M.-C. JANIN-BUSSAT, A. BECK, S. HEINISCH. Analysis of antibody-drug conjugates by comprehensive on-line two-dimensional hydrophobic interaction chromatography x reversed phase liquid chromatography hyphenated to high resolution mass spectrometry. I - Optimization of conditions. *J. Chromatogr. B*, 1032 (2016) 103-111. 2.68
19. M. SARRUT, M.-C. JANIN-BUSSAT, S. FEKETE, D. GUILLARME, A. BECK, S. HEINISCH. Analysis of antibody-drug conjugates by comprehensive on-line two-dimensional hydrophobic interaction chromatography x reversed phase liquid chromatography hyphenated to high resolution mass spectrometry. II- Identification of sub-units for the characterization of even and odd load drug species. *J. Chromatogr. B*, 1032 (2016) 91-102. 2.68

20.	<a href="#">E. TYTECA, J.L. VEUTHEY, G. DESMET, D. GUILLARME, S. FEKETE. Computer assisted liquid chromatographic method development for the separation of therapeutic proteins. <i>Analyst</i>, 141 (2016) 5488-5501.</a>	4.03
21.	<a href="#">D. GUILLARME, J.-L. VEUTHEY. HPLC teaching assistant: a new tool for learning and teaching liquid chromatography – part I. <i>LC-GC North America</i>, 34 (2016) 804-811.</a>	0.51
22.	<a href="#">D. GUILLARME, J.-L. VEUTHEY. HPLC teaching assistant: a new tool for learning and teaching liquid chromatography – part II, <i>LC-GC North America</i>, 34 (2016) 906-915.</a>	0.51
23.	<a href="#">S. FEKETE, J.-L. VEUTHEY, A. BECK, D. GUILLARME. Hydrophobic interaction chromatography for the characterization of monoclonal antibodies and related products, <i>J. Pharm. Biomed. Anal.</i>, 130 (2016) 3-18.</a>	3.16
24.	<a href="#">M. SORENSEN, D.-C. HARMES, D.R. STOLL, G.A. STAPLES, S. FEKETE, D. GUILLARME, A. BECK. Comparison of Originator and Biosimilar Therapeutic Monoclonal Antibodies using Comprehensive Two-Dimensional Liquid Chromatography Coupled with Time-of-Flight Mass Spectrometry, <i>mAbs</i>, 8 (2016) 1224-1234.</a>	2.54
25.	<a href="#">V. GONZALEZ-RUIZ, S. CODESIDO, J. FAR, S. RUDAZ, J. SCHAPPLER. Evaluation of a new low sheath-flow interface for CE-MS. <i>Electrophoresis</i>, 37 (2016) 936-946.</a>	2.48
26.	<a href="#">N. DROUIN, S. RUDAZ, J. SCHAPPLER. New trends in sample preparation for bioanalysis. <i>Am. Pharm. Rev.</i>, 2 (2016) 1-6.</a>	0.35
27.	<a href="#">N. DROUIN, S. RUDAZ, J. SCHAPPLER. Dynamic-electromembrane extraction: a technical development for the extraction of neuropeptides. <i>Anal. Chem.</i>, 88 (2016) 5308-5315.</a>	5.88
28.	<a href="#">A. BUJARD, C. PETIT, P.-A. CARRUPT, S. RUDAZ, J. SCHAPPLER. HDM-PAMPA to predict gastrointestinal absorption, binding percentage, equilibrium and kinetics constants with human serum albumin and using 2 end-point measurements. <i>Eur. J. Pharm. Sci.</i>, 97 (2016) 143-150.</a>	3.77
29.	<a href="#">L. BERTOLETTI, J. SCHAPPLER, R. COLOMBO, S. RUDAZ, R. HASELBERG, E. DOMÍNGUEZ-VEGA, S. RAIMONDI, G. W. SOMSEN, E. DE LORENZI. Evaluation of capillary electrophoresis-mass spectrometry for the analysis of the conformational heterogeneity of intact proteins using beta2-microglobulin as model compound. <i>Anal. Chim. Acta</i>, 945 (2016) 102-109.</a>	4.51
30.	<a href="#">J. SCHAPPLER, S. RUDAZ. Characterization of counterfeit and substandard medicines using capillary electrophoresis. <i>LCGC Europe</i>, 29 (2016) 38-42.</a>	0.48
31.	<a href="#">F. JEANNERET, D. TONOLI, D. HOCHSTRASSER, J.-H. SAURAT, O. SORG, J. BOCCARD, S. RUDAZ. Evaluation and identification of dioxin exposure biomarkers in human urine by high-resolution metabolomics, multivariate analysis and in vitro synthesis. <i>Toxicol. Lett.</i>, 240(1) (2016) 22–31.</a>	3.52
32.	<a href="#">F. JEANNERET, D. TONOLI, M. ROSSIER, M. SAUGY, J. BOCCARD, S. RUDAZ. Evaluation of steroidomics by liquid chromatography hyphenated to mass spectrometry as a powerful analytical strategy for measuring human steroid perturbations. <i>J. Chromatogr. A</i>, 1430 (2016) 97–112.</a>	3.92
33.	<a href="#">F. PONZETTO, F. MEHL, J. BOCCARD, N. BAUME, S. RUDAZ, M. SAUGY, R. NICOLI. Longitudinal monitoring of endogenous steroids in human serum by UHPLC-MS/MS as a tool to detect testosterone abuse in sport. <i>Anal. Bioanal. Chem.</i>, 408(3) (2016) 705-719.</a>	3.12
34.	<a href="#">S. BERTRAND, A. AZZOLLINI, A. NIEVERGELT, J. BOCCARD, S. RUDAZ, M. CUENDET, J.-L. WOLFENDER. Statistical correlations between HPLC activity-based profiling results and NMR/MS microfractions data to deconvolute bioactive compounds in mixture. <i>Molecules</i>, 21(3) (2016) 259.</a>	2.46
35.	<a href="#">J. BOCCARD, S. RUDAZ. Exploring Omics data from designed experiments using Analysis of Variance Multiblock Orthogonal Partial Least Squares. <i>Anal. Chim. Acta</i>, 920 (2016) 18-28.</a>	4.51

36. E. JACCOULET, J. BOCCARD, M. TAVERNA, A. SANTOS AZEVEDOS, S. RUDAZ, C. SMADJA. High throughput identification of monoclonal antibodies after compounding by UV spectroscopy coupled to chemometrics analysis. *Anal. Bioanal. Chem.*, 408 (2016) 5915-5924. 3.12
37. D. SPAGGIARI, Y. DAALI, S. RUDAZ. An extensive cocktail approach for rapid risk assessment of in vitro CYP450 direct reversible inhibition by xenobiotic exposure. *Pharmacol.*, 302 (2016) 41-51. 1.53
38. A. HAMMER, S. RUDAZ, S. GHINCHARD, S. KLING, D. TABIBIAN, O. RICHOS, F. HAFEZI. Analysis of riboflavin compounds in the rabbit cornea in vivo. *Curr. Eye Res.*, 41 (2016) 1-7. 2.02
39. C. DIEZ, M. FEINBERG, A. STAUB SPORRI, E. COGNARD, D. ORTELLI, P. EDDER, S. RUDAZ. Evaluation of quantification methods to compensate for matrix effects in the analysis of Benzalkonium chloride and Didecylmethylammonium chloride in fruits and vegetables by LC-ESI-MS/MS. *Food Anal. Meth.*, 9 (2016) 485-499. 2.16
40. N. VASILEV, J. BOCCARD, G. LANG, U. GRÖMPING, R. FISCHER, S. GOEPFERT, S. RUDAZ, S. SCHILLBERG. Structured plant metabolomics for the simultaneous exploration of multiple factors. *Sci. Rep.*, 6 (2016) 37390. 5.22
41. P. COULERIE, Y. RATINAUD, S. MOCO, L. MERMINOD, M. NARANJO PINTA, J. BOCCARD, L. BULTOT, M. DEAK, K. SAKAMOTO, E. QUEIROZ, J.-L. WOLFENDER, D. BARRON. A Standardized LCxLC-ELSD Fractionation Procedure for the Identification of Minor Bioactives via the Enzymatic Screening of Natural Extracts. *J. Nat. Prod.*, 79 (2016) 2856–2864. 3.66
42. N. MARSOUSI, F. DOFFEY-LAZEYRAS, S. RUDAZ, J. DESMEULES, Y. DAALI. Intestinal permeability and P-glycoprotein mediated efflux transport of ticagrelor in Caco-2 monolayer cells. *Fund. Clin. Pharmacol.*, 30 (2016) 577-584. 2.15
43. N. MARSOUSI, C. SAMER, P. FONTANA, J.-L. RENY, S. RUDAZ, J. DESMEULES, Y. DAALI. Co-administration of ticagrelor and ritonavir: Towards prospective dose adjustment to maintain an optimal platelet inhibition using PBPK approach. *Clin. Pharmacol. Ther.* 100 (2016) 295-304. 1.83

## SCIENTIFIC PUBLICATIONS (WITHOUT IMPACT FACTOR)

1. E. A. DIOP, J. SCHAPPLER, E. REGINATO, C. ROHRBASSER, P. BONNABRY, S. RUDAZ. Une solution fiable et peu coûteuse pour contrôler la qualité des médicaments dans les pays émergents. *Pharmajournal*, 24 (2016) 6-7.
2. J.-L. VEUTHEY. Particules superficiellement poreuses en chromatographie liquide. *Techniques de l'ingénieur*. 187 (2016) 1-9.
3. S. FEKETE, J. FEKETE, D. GUILLARME. Korszerű méretkizárásos kromatográfia: fehérje aggregátumok elválasztása. *Kromatográfus, May*, 8-11 (2016).
4. R. NICOLI, D. GUILLARME, N. LEUENBERGER, N. BAUME, N. ROBINSON, M. SAUGY, J.-L. VEUTHEY. Stratégies analytiques pour les contrôles antidopage: besoins, challenges et perspectives. *Spectra Analyse*, 310 (2016) 42-53.
5. O. SARR, E. H. A. DIOP, A. DIOP, A. G. S. ATOUNI, S. M. NDIAYE, C. A. WAFO TCHOUNGA, R. GUEYE, K. THIAM, T. M. WANE, A. SARR, B. NDIAYE, S. RUDAZ, Y. M. DIOP. Development and validation of a capillary electrophoresis method for quality assessment of metronidazole-based drugs. *Int. J. Modern Anal. Sep. Sci.*, 5 (2016) 1-11.
6. R. NICOLI, D. GUILLARME, N. LEUENBERGER, N. BAUME, N. ROBINSON, M. SAUGY, J.-L. VEUTHEY. Stratégies analytiques pour les contrôles antidopage: besoins, challenges et perspectives. *Spectra Biologie*, 224 (2016) 45-56.

## BOOKS OR BOOKS CHAPTERS

1. F. PONZETTO, S. GIRAUD, N. LEUENBERGER, J. BOCCARD, R. NICOLI, N. BAUME, S. RUDAZ, M. SAUGY, *Methods for Doping Detection in Sports Endocrinology*. Karger, 2016.
2. J. SCHAPPLER, S. RUDAZ. Capillary Electrophoresis-Ultraviolet-Mass Spectrometry (CE-UV-MS) for the Simultaneous Determination and Quantification of Insulin Formulations in Capillary Electrophoresis of Proteins and Peptides. *Methods and Protocols*, Nguyet Thuy Tran and Myriam Taverna (eds): Humana Press, © Springer Science+Business Media New York (2016). ISBN 978-1-4939-4012-7
3. J. SCHAPPLER, V. GONZÁLEZ-RUIZ, S. RUDAZ. CE-MS in Drug Analysis and Bioanalysis. In "Capillary Electrophoresis Mass Spectrometry, Principles and Applications". Gerhardus de Jong Editor Wiley VCH Verlag GmbH & Co., KGaA, Weinheim, Germany (2016). ISBN: 978-3-527-33924-2
4. J. SCHAPPLER, S. RUDAZ. Nonaqueous Capillary Electrophoresis. In Wiley-VCH book project, Volume 2 "Analytical Separation Science". Wiley VCH Verlag GmbH & Co., KGaA, Weinheim, Germany (2016). ISBN: 9783527678129

## PRESENTATIONS

### POSTERS PRESENTATIONS

1. M. SARRUT, A. CORGIER, S. FEKETE, A. BECK, D. GUILLARME, S. HEINISCH. Optimization of conditions for the analysis of ADCs by on-line HIC x RPLC-UV/MS. HTC-14 – January 2016, Ghent (Belgium).
2. G. M. RANDAZZO, Q. FAVRE-GODAL, S. DORSAZ, E. F. QUEIROZ, L. MARCOURT, D. SANGLARD, J.-L. WOLFENDER, J. BOCCARD, S. RUDAZ. A new method to navigate large molecular datasets using the chemical space of natural products: application to antifungal activity. *Chimimétrie XVII*, January 18-20, 2016, Namur (Belgium).
3. F. MEHL, F. PONZETTO, R. NICOLI, N. BAUME, M. SAUGY, J. BOCCARD, S. RUDAZ. Longitudinal monitoring of endogenous steroids in human serum by UHPLC-MS/MS as a tool to detect testosterone abuse in sport. *Chimimétrie XVII*, January 18-20, 2016, Namur (Belgium).
4. F. JEANNERET, J. SANDSTRÖM VON TOBEL, J. BOCCARD, F. MONNET-TSCHUDI, S. RUDAZ. Targeted- and untargeted analysis of maturation dependent adverse effects of paraquat exposure in 3D rat brain cell cultures. *Systems Toxicology*, January 27-29, 2016, Les Diablerets (Switzerland).
5. D. TONOLI, P. STRAJHAR, J. BOCCARD, F. JEANNERET, G. M. RANDAZZO, D. KRATSCHMAR, A. ODERMATT, S. RUDAZ. Steroidomic Footprinting based on UHPLC-MS for the Characterization of Endocrine Disrupting Chemicals in H295R Cells: a Focus on Identification. *Systems Toxicology*, January 27-29, 2016, Les Diablerets (Switzerland).
6. D. GUILLARME. *La recherche académique en Suisse : parcours personnel et projets de recherche actuels*. Ecole doctorale, April 2016, Strasbourg (France).
7. J. SCHAPPLER, C. ROHRBASSER, P. BONNABRY, S. RUDAZ. Low-cost capillary electrophoresis for counterfeit detection and quality control of substandard drugs in emerging countries. *Geneva Health Forum*, April 2016, Geneva (Switzerland).
8. G. KAMMEIJER, C. FRANCEY, M. WUHRER, J. SCHAPPLER. pKa determination of closely-related sialylated glycoconjugates by capillary electrophoresis. *32<sup>nd</sup> International Symposium on Microscale Separations and Bioanalysis (MSB 2016)*, 3-7 April 2016, Niagara-on-the-Lake (Canada).
9. V. GONZALEZ-RUIZ, S. CODESIDO, J. FAR, S. RUDAZ, J. SCHAPPLER. Evaluation of a simple low sheath-flow interface for CE-MS. *32<sup>nd</sup> International Symposium on Microscale Separations and Bioanalysis (MSB 2016)*, 3-7 April 2016, Niagara-on-the-Lake (Canada).
10. J. SCHAPPLER, E. REGINATO, L. D'ESPINE, M.-C. LAI, A. DIOP, S. RUDAZ. Low-cost capillary electrophoresis for counterfeits detection and sub-standard drugs quality control. *32<sup>nd</sup> International Symposium on Microscale Separations and Bioanalysis (MSB 2016)*, 3-7 April 2016, Niagara-on-the-Lake (Canada).



11. V. HOUBART, A. NAPP, S. RUDAZ, J. SCHAPPLER, M. FILLET. Alpha-synuclein as biomarker in Parkinson's disease: strategies for detection in CGE-LIF. 32<sup>nd</sup> International Symposium on Microscale Separations and Bioanalysis (MSB 2016), -7 April 2016, Niagara-on-the-Lake (Canada).
12. N. DROUIN, S. RUDAZ, J. SCHAPPLER. Dynamic electromembrane extraction (d-EME): a new technical development. 32<sup>nd</sup> International Symposium on Microscale Separations and Bioanalysis (MSB 2016), 3-7 April 2016, Niagara-on-the-Lake (Canada).
13. N. DROUIN, S. RUDAZ, J. SCHAPPLER. d-Electromembrane extraction: a new technical development. 32<sup>nd</sup> International Symposium on Microscale Separations and Bioanalysis (MSB 2016), -7 April 2016, Niagara-on-the-Lake (Canada).
14. N. DROUIN, S. RUDAZ, J. SCHAPPLER. Les techniques de préparation d'échantillon miniaturisées. Lab Innovation, Lausanne, Switzerland, April 2016.
15. N. DROUIN, S. RUDAZ, J. SCHAPPLER. Extraction of polar metabolites from CSF by electromembrane extraction. 32<sup>nd</sup> International Symposium on Microscale Separations and Bioanalysis (MSB 2016), Niagara-on-the-Lake, Canada, 3-7 April 2016.
16. G. KAMMEIJER, C. FRANCEY, M. WUHRER, J. SCHAPPLER. pKa determination of closely-related sialylated glycoconjugates by capillary electrophoresis. 32<sup>nd</sup> International Symposium on Microscale Separations and Bioanalysis (MSB 2016), 3-7 April 2016, Niagara-on-the-Lake (Canada).
17. V. GONZALEZ-RUIZ, S. CODESIDO, J. FAR, S. RUDAZ, J. SCHAPPLER. Evaluation of a simple low sheath-flow interface for CE-MS. 32<sup>nd</sup> International Symposium on Microscale Separations and Bioanalysis (MSB 2016), 3-7 April 2016, Niagara-on-the-Lake (Canada).
18. J. SCHAPPLER, E. REGINATO, L. D'ESPINE, M.-C. LAI, A. DIOP, S. RUDAZ. Low-cost capillary electrophoresis for counterfeit detection and sub-standard drugs quality control. 32<sup>nd</sup> International Symposium on Microscale Separations and Bioanalysis (MSB 2016), 3-7 April 2016, Niagara-on-the-Lake (Canada).
19. V. HOUBART, A. NAPP, S. RUDAZ, J. SCHAPPLER, M. FILLET. Alpha-synuclein as biomarker in Parkinson's disease: strategies for detection in CGE-LIF. 32<sup>nd</sup> International Symposium on Microscale Separations and Bioanalysis (MSB 2016), 3-7 April 2016, Niagara-on-the-Lake (Canada).
20. N. DROUIN, S. RUDAZ, J. SCHAPPLER. Dynamic electromembrane extraction (d-EME): a new technical development. 32<sup>nd</sup> International Symposium on Microscale Separations and Bioanalysis (MSB 2016), 3-7 April 2016, Niagara-on-the-Lake (Canada).
21. J. SCHAPPLER, C. ROHRBASSER, P. BONNABRY, S. RUDAZ. Low-cost capillary electrophoresis for counterfeit detection and quality control of substandard drugs in emerging countries. Geneva Health Forum, April 2016, Geneva (Switzerland).
22. A. SCHERL, P. ZIMMERLI, F. MEHL, C. BATTAGLIERO, D. ORTELLI, S. RUDAZ, P. EDDER. Rapid screening for oil authenticity using IR spectroscopy followed by triglyceride analysis. FoodIntegrity 2016, 6-7 April 2016, Prague (Czech Republic).
23. N. DROUIN, J. SCHAPPLER, S. RUDAZ. Electromembrane extraction for cationic metabolome analysis. Symposium on Separation Sciences, 8-9 June 2016, Copenhagen (Denemark).
24. J. BOCCARD, S. RUDAZ. Simultaneous analysis of the spatial and temporal response to wounding in *Arabidopsis thaliana* using multifactorial metabolomics and chemometrics. 10<sup>èmes</sup> Journées Scientifiques du Réseau Français de Métabolomique et Fluxomique, May 30-June 2, 2016, Montpellier (France).
25. D. TONOLI, P. STRAJHAR, J. BOCCARD, D. HOCHSTRASSER, F. JEANNERET, A. ODERMATT, S. RUDAZ. UHPLC-HRMS steroidomic footprinting for in vitro endocrine disruptor evaluation. 10<sup>èmes</sup> Journées Scientifiques du Réseau Français de Métabolomique et Fluxomique, May 30-June 2, 2016, Montpellier (France).
26. G. M. RANDAZZO, D. TONOLI, S. HAMBYE, D. GUILLARME, F. JEANNERET, A. NURISSO, L. GORACCI, J. BOCCARD, S. RUDAZ. Prediction of retention time to help metabolite identification in reversed-phase liquid chromatography: Application to steroidomics. 10<sup>èmes</sup> Journées Scientifiques du Réseau Français de Métabolomique et Fluxomique, May 30-June 2, 2016, Montpellier (France).



27. Y. GAGNEBIN, M. RANDAZZO, D. TONOLI, F. JEANNERET, N. BARARPOUR, Y. DAALI, P. LESCUYER, B. PONTE, S. DE SEIGNEUX, P.-Y. MARTIN, J. SCHAPPLER, J. BOCCARD, S. RUDAZ. Data processing and multi-block analysis for urine metabolomics: application to kidney failure. 10<sup>èmes</sup> Journées Scientifiques du Réseau Français de Métabolomique et Fluxomique, May 30-June 2, 2016, Montpellier (France).
28. M. SORENSEN, D. HARMES, G. STAPLES, D. GUILLARME, A. BECK, D. STOLL. Electrospray-ionization time-of-flight mass spectrometry coupled to online, comprehensive two-dimensional liquid chromatography for the characterization of therapeutic monoclonal antibodies. ASMS – San Diego, USA, 5-9 June 2016, San Diego (USA).
29. N. DROUIN, S. RUDAZ, J. SCHAPPLER. Electromembrane extraction for cationic metabolome analysis. Symposium on Separation Sciences, 8-9 June 2016, Copenhagen (Denmark).
30. L. NOVAKOVA, V. DESFONTAINE, F. PONZETTO, R. NICOLI, M. SAUGY, J.L. VEUTHEY, D. GUILLARME. UHPSFC-MS/MS as a viable option in doping control analysis. HPLC 2016 – 19-24 June 2016, San Francisco (USA).
31. S. RUDAZ, G. M. RANDAZZO, J. BOCCARD, F. JEANNERET, D. TONOLI, D. GUILLARME, A. NURISSO, L. GORACCI, S. HAMBYE. Dynamic LC retention times prediction for marker candidate's identification: steroidomics as a case study. 12<sup>th</sup> Annual Conference of the Metabolomics Society, June 27-30, 2016, Dublin (Ireland).
32. M. WITTING, N. SILLNER, D. SPAGGIARI, S. RUDAZ, J. LINTELMANN, J.-P. SCHNITZLER, O. BEGOU, G. THEODORIDIS, H. GIKA, P. SCHMITT-KOPPLIN, M. QUILLIAM. Retention time indexing in RP-LC-MS based metabolomics for enhancing metabolite identification: A cross-lab trial. 12<sup>th</sup> Annual Conference of the Metabolomics Society, June 27-30, 2016, Dublin (Ireland).
33. A. AZZOLLINI, L. BOGGIA, J. BOCCARD, B. SGORBINI, N. LECOULTRE, P. RUBIOLO, S. RUDAZ, K. GINDRO, C. BICCHI, J.-L. WOLFENDER. Detection and dynamics of volatile/non-volatile metabolite induction in a fungal co-culture through a miniaturised MS-based metabolomic approach. 9<sup>th</sup> Joint Natural Products Conference, July 25-27, 2016, Copenhagen (Denmark).
34. A. GOYON, J.L. VEUTHEY, A. BECK, D. GUILLARME, S. FEKETE. Possibilities of current sub-3 µm SEC columns for the characterization of biopharmaceuticals aggregation. ISC 2016, 28 August – 1 September 2016, Cork (Ireland).
35. J. SCHAPPLER, E.H. A. DIOP, E. REGINATO, C. ROHRBASSER, P. BONNABRY, S. RUDAZ. Low-Cost Analytical Device for Detecting Counterfeits and Sub-Standards in Emerging Countries. Swiss Pharma Science Day 2016, August 2016, Berne (Switzerland).
36. S. RUDAZ, G. M. RANDAZZO, J. BOCCARD, F. JEANNERET, D. TONOLI, D. GUILLARME, A. NURISSO, L. GORACCI, S. HAMBYE. Dynamic LC retention times prediction for marker candidate's identification: steroidomics as a case study. Swiss Pharma Science Day, 31 August, 2016, Bern (Switzerland).
37. P. STRAJHAR, D. TONOLI, R. M. IMHOF, V. MALAGNINO, D. V. KRATSCHMAR, J. BOCCARD, S. RUDAZ, A. ODERMATT. Steroid profiling in H295R cells to identify chemicals potentially disrupting the production of corticosteroids and adrenal androgens. Eurotox 2016, 4-7 September, 2016, Seville (Spain).
38. V. D'ATRI, S. FEKETE, J.L. VEUTHEY, D. GUILLARME. Terápiás fehérjék vizsgálata hidrofil kölcsönhatási kromatográfiával (HILIC). Hungarian separation science meeting – November 2016, Kecskemét (Hungary).
39. S. FEKETE, D. GUILLARME. Elválasztási hatékonyság és analízis-idő a különböző folyadékkromatográfiás módokban, antitestek elválasztásakor. Hungarian separation science meeting – November 2016, Kecskemét (Hungary).
40. Y. GAGNEBIN, D. TONOLI, P. LESCUYER, B. PONTE, S. DE SEIGNEUX, P.-Y. MARTIN, J. SCHAPPLER, J. BOCCARD, S. RUDAZ. Metabolomic analysis of urine samples by UHPLC-QTOF-MS: impact of normalization strategies. 27<sup>th</sup> Int. Symposium on Pharmaceutical and Biomedical Analysis, 13-16 November 2016, Guangzhou (China).
41. NI. DROUIN, S. RUDAZ, J. SCHAPPLER. Electromembrane extraction for the sample preparation of scarce biofluids: application to polar cationic metabolites. 27<sup>th</sup> International Symposium on Pharmaceutical and Biomedical Analysis (PBA 2016), 13-16 November 2016, Guangzhou (China).

42. J. SCHAPPLER, E. H. A. DIOP, E. REGINATO, C. ROHRBASSER, P. BONNABRY, S. RUDAZ. Development of a low-cost analytical strategy for the detection of counterfeit and sub-standard medicines in emerging countries. 27<sup>th</sup> International Symposium on Pharmaceutical and Biomedical Analysis (PBA 2016), 13-16 November 2016, Guangzhou (China)
43. N. MARSOUSI, Y. DAALI, P. FONTANA, S. RUDAZ, C. SAMER, J. DESMEULES. Coadministration of ticagrelor and ritonavir: Toward prospective dose adjustment to maintain an optimal platelet inhibition using the PBPK approach. MedLem16 meeting, 17 November 2016, Geneva (Switzerland).

## ORAL PRESENTATIONS

1. D. STOLL, D.C. HARMES, M. SORENSEN, E. WAGNER-ROUSSET, S. FEKETE, D. GUILLARME, A. BECK. Two-Dimensional Liquid Chromatography Strategies Coupled with Mass Spectrometry for Efficient, High Resolution Characterization of Therapeutic Monoclonal Antibodies. 20<sup>th</sup> Symposium on the Interface of Regulatory and Analytical Sciences for Biotechnology Health Products, January 2016, Washington (USA).
2. J.-L. VEUTHEY. La lute antidopage est-elle une cause perdue d'avance? CIUTI Forum 2016, 14-15 January, 2016, Geneva (Switzerland).
3. Y. GAGNEBIN, J. SCHAPPLER, J. BOCCARD, S. RUDAZ. Normalization strategies of urine samples using individual dilution factors and chemometrics for metabolomic analysis based on UHPLC-QTOF-MS. Chimiométrie XVII, Namur, 19-20 January 2016, Namur (Belgium).
4. J. BOCCARD, S. RUDAZ. ANOVA-Multiblock Orthogonal Partial Least Squares (AMOPLS) for exploring metabolomic data from designed experiments. Chimiométrie XVII, Namur, 19-20 January 2016, Namur (Belgium).
5. S. RUDAZ. Modélisation de la rétention des stéroïdes en chromatographie à ultra-haute performance sur support de phase inverse. Challenge Chimiométrie 2016, 19-20 January 2016, Namur (Belgium).
6. J.-L. VEUTHEY, D. GUILLARME. Quoi de neuf en chromatographie au XXI<sup>ème</sup> siècle? Société française de toxicology analytique, 22 January 2016, Paris (France).
7. J.-L. VEUTHEY. Advances in LC and SFC Analysis. HTC-14, 14<sup>th</sup> Int. Symposium on Hyphenated Techniques in Chromatography and Separation Technology, 27-29 January 2016, Ghent (Belgium).
8. S. HAMBÛE, D. TONOLI, F. JEANNERET, S. RUDAZ. A new UHPLC-MS/MS method for the determination of testosterone, androstenedione, and 17- hydroxyprogesterone in human plasma using isotopic internal calibration. A new way for endogenous steroids quantification? HTC-14, 14<sup>th</sup> Int. Symposium on Hyphenated Techniques in Chromatography and Separation Technology, 27-29 January 2016, Ghent (Belgium).
9. S. FEKETE, J.L. VEUTHEY, D. GUILLARME. Modern liquid chromatographic approaches for the analytical characterization of biopharmaceuticals. HTC-14, 14<sup>th</sup> Int. Symposium on Hyphenated Techniques in Chromatography and Separation Technology, 27-29 January 2016, Ghent (Belgium).
10. A. PERIAT, J.L. VEUTHEY, D. GUILLARME. Comparison of HILIC-MS and. RPLC-MS performance in terms of sensitivity and matrix effects. HTC-14, 14<sup>th</sup> Int. Symposium on Hyphenated Techniques in Chromatography and Separation Technology, 27-29 January 2016, Ghent (Belgium).
11. D. GUILLARME. SFC in pharmaceutical analysis. HTC-14, 14<sup>th</sup> Int. Symposium on Hyphenated Techniques in Chromatography and Separation Technology, 27-29 January 2016, Ghent (Belgium).
12. A. GRAND-GUILLAUME PERRENOUD, D. GUILLARME, J.L. VEUTHEY, D. BARRON, S. MOCO. Combining the analytical potential of UHPSFC-QToF/MS and UHPLC-QToF/MS for natural bioactives identification. HTC-14, 14<sup>th</sup> Int. Symposium on Hyphenated Techniques in Chromatography and Separation Technology, 27-29 January 2016, Ghent (Belgium).
13. F. PONZETTO, F. MEHL, J. BOCCARD, N. BAUME, S. RUDAZ, M. SAUGY, R. NICOLI. Longitudinal follow-up of endogenous steroids in serum: a first step towards "steroid profile" in blood. 34<sup>th</sup> Cologne Workshop on Dope Analyses, Cologne, Germany, February 21-26, 2016.
14. J.L. VEUTHEY. New insights in SFC and SFC-MS. Chromatographic Society meeting: Advances in microcolumn and related separation technologies, 22 March 2016, London (United Kingdom).

15. D. GUILLARME. UHPLC: où en sommes-nous 10 ans après sa commercialisation? Club Lyonnais de chromatographie - March 2016, Paris (France).
16. D. GUILLARME. Quelles approches chromatographiques pour l'analyse de protéines thérapeutiques? Club de chromatographie Ile de France - March 2016, Paris (France).
17. D. GUILLARME, S. FEKETE, J.L. VEUTHEY. Column technology for the chromatographic characterization of biopharmaceuticals. Pittcon congress – March 2016, Atlanta (USA).
18. J. BOCCARD. Advanced Chemometric Methods for MS-based Metabolomics. Métabolomique: Outils et méthodologie, 4-6 April, 2016, Clermont-Ferrand (France).
19. J. SCHAPPLER. Les techniques de préparation d'échantillon miniaturisées. Lab Innovations, 13 May, 2016, Lausanne (Switzerland).
20. J. BOCCARD. Le traitement des données analytiques. Lab Innovations, 13 May, 2016, Lausanne (Switzerland).
21. L. NOVAKOVA, V. DESFONTAINE, F. PONZETTO, R. NICOLI, M. SAUGY, J.L. VEUTHEY, D. GUILLARME. UHPSFC-MS/MS in doping screening analysis. Chiranal – 6-9 June 2016, Olomouc (Czech Republic).
22. N. DROUIN, S. RUDAZ, J. SCHAPPLER. Analysis of scarce biofluids: electromembrane extraction and capillary electrophoresis coupled to mass spectrometry are a good match. Symposium on Separation Sciences, 8-9 June 2016, Copenhagen (Denmark).
23. A. GRAND-GUILLAUME PERRENOUD, D. GUILLARME, J.L. VEUTHEY, D. BARRON, S. MOCO. Combining the full potential of UHPSFC-QTOF/MS and UHPLC-QTOF/MC for natural bioactives efficient analysis. HPLC 2016 – 19-24 June 2016. San Fransisco (USA).
24. J. BOCCARD, F. JEANNERET, S. RUDAZ. Exploring metabolomic data from designed experiments using ANOVA-Multiblock Orthogonal Partial Least Squares. 12th Annual Conference of the Metabolomics Society, June 27-30, 2016, Dublin (Ireland).
25. D. GUILLARME, J.L. VEUTHEY, S. FEKETE. Modern liquid chromatographic approaches for the characterization of biopharmaceuticals. ISC 2016, 28 August – 1 September 2016, Cork (Ireland).
26. V. D'ATRI, S. FEKETE, A. PERIAT, J.L. VEUTHEY, D. GUILLARME. Hydrophilic Interaction Chromatography (HILIC) for the analytical characterization of protein biopharmaceuticals. ISC 2016, 28 August – 1 September 2016, Cork (Ireland).
27. V. DESFONTAINE, L. NOVAKOVA, F. PONZETTO, R. NICOLI, M. SAUGY, J.L. VEUTHEY, D. GUILLARME. UHPLC-MS/MS and UHPSFC-MS/MS as alternative techniques to GC-MS/MS for the rapid screening of anabolic agents in urine. ISC 2016, 28 August – 1 September 2016, Cork (Ireland).
28. J. L. VEUTHEY, A. GRAND-GUILLAUME PERRENOUD, L. NOVAKOVA, V. DESFONTAINE, D. GUILLARME. SFC and SFC-MS in drugs analysis. ISC 2016, 28 August – 1 September 2016, Cork (Ireland).
29. L. NOVAKOVA, V. DESFONTAINE, A. GRAND-GUILLAUME PERRENOUD, F. PONZETTO, R. NICOLI, M. SAUGY, J. L. VEUTHEY, D. GUILLARME. Is SFC-MS/MS a viable strategy for doping control analysis? SFC 2016 – 5-7 October, 2016 Vienna (Austria).
30. NICOLAS DROUIN, SERGE RUDAZ, JULIE SCHAPPLER. Analysis of polar metabolites by CE-MS/MS. Agilent User-Meeting, November 2016, Lausanne (Switzerland).
31. D. GUILLARME, A. GOYON, B. BOBALY, V. D'ATRI, J.L. VEUTHEY, S. FEKETE. Innovative analytical tools for the characterization of proteins biopharmaceuticals. 27th International Symposium on Pharmaceutical and Biomedical Analysis, 13-16 November, 2016 Guangzhou (China).
32. S. RUDAZ. Metabolomic approach for steroid analysis in toxicological studies. 27th International Symposium on Pharmaceutical and Biomedical Analysis, 13-16 November, 2016 Guangzhou (China).
33. E. JACCOULET, C. SMADJA, J. BOCCARD, A. SANTOS AZEVEDO, P. PROGNON, S. RUDAZ, M. TAVERNA. New Analytical methods for identity assessment of therapeutic Mabs. 27th International Symposium on Pharmaceutical and Biomedical Analysis, 13-16 November, 2016, Guangzhou (China).

34. F. JEANNERET, V. GONZÁLEZ-RUIZ, J. SANDSTRÖM, F. TSCHUDI-MONNET, M.-G ZURICH, J. BOCCARD, S. RUDAZ. Putting together neuroinflammation, untargeted metabolomics and data mining in biomarker discovery for neurodegenerative diseases. MedLem16 meeting, November 17, 2016, Geneva (Switzerland).
35. S. FEKETE, A. GOYON, J.L. VEUTHEY, D. GUILLARME. Fehérjék méretkizárásos kromatográfiás elválasztása: érdekességek, meglepetések, buktatók. Hungarian separation science meeting – November 2016, Kecskemét (Hungary).
36. S. BOBALY, A. BECK, J.L. VEUTHEY, J. FEKETE, D. GUILLARME, J.L. VEUTHEY. Szerves eluensmódosítók alkalmazása terápiás fehérjék hidrofób kölcsönhatáson alapuló kromatográfiával (HIC) történő elválasztásában-módszeroptimalás. Hungarian separation science meeting – November 2016, Kecskemét (Hungary).
37. Y. GAGNEBIN, D. TONOLI, J. BOCCARD, S. RUDAZ. Extended steroid profiling in human - a metabolomic approach. SCAHT Retreat, December 1-2, 2016, Neuchâtel (Switzerland).
38. V. GONZÁLEZ-RUIZ, J. SANDSTRÖM, F. JEANNERET, F. TSCHUDI-MONNET, M.-G ZURICH, J. BOCCARD, S. RUDAZ. Untargeted data acquisition for metabolomic studies in neuroinflammation. SCAHT Retreat, December 1-2, 2016, Neuchâtel (Switzerland).

## CONGRESSES & SYMPOSIA

1. HTC 14, January 2016, Ghent (Belgium).
2. Chimiométrie XVII, Namur, 19-20 January 2016, Namur (Belgium).
3. CIUTI Forum 2016, 14-15 January, 2016, Geneva (Switzerland).
4. Systems Toxicology, January 27-29, 2016, Les Diablerets (Switzerland).
5. 20<sup>th</sup> Symposium on the Interface of Regulatory and Analytical Sciences for Biotechnology Health Products, January 2016, Washington (USA).
6. 34<sup>th</sup> Cologne Workshop on Dope Analyses, Cologne, Germany, February 21-26, 2016.
7. Pittcon congress – March 2016, Atlanta (USA).
8. Geneva Health Forum, April 2016, Geneva (Switzerland).
9. 32<sup>nd</sup> International Symposium on Microscale Separations and Bioanalysis (MSB 2016), 3-7 April 2016, Niagara-on-the-Lake (Canada).
10. FoodIntegrity 2016, 6-7 April 2016, Prague (Czech Republic).
11. 10<sup>èmes</sup> Journées Scientifiques du Réseau Français de Métabolomique et Fluxomique, May 30-June 2, 2016, Montpellier (France).
12. Chiranal – 6-9 June 2016, Olomouc (Czech Republic).
13. ASMS – San Diego, USA, 5-9 June 2016, San Diego (USA).
14. Symposium on Separation Sciences, 8-9 June 2016, Copenhagen (Denemark).
15. HPLC 2016 – 19-24 June 2016, San Francisco (USA).
16. 12<sup>th</sup> Annual Conference of the Metabolomics Society, June 27-30, 2016, Dublin (Ireland).
17. 9<sup>th</sup> Joint Natural Products Conference, 25-27 July, 2016, Copenhagen (Denmark).
18. ISC 2016, 28 August – 1<sup>st</sup> September 2016, Cork (Ireland).
19. Swiss Pharma Science Day 2016, August 2016, Berne (Switzerland).
20. Eurotox 2016, 4-7 September, 2016, Seville (Spain).
21. 20<sup>èmes</sup> Journées scientifiques du CCCTA, 15-16 September, 2016, Les Diablerets (Switzerland).

22. SFC 2016 – 5-7 October, 2016 Vienna (Austria).
23. Hungarian separation science meeting – November 2016, Kecskemét (Hungary).
24. 27<sup>th</sup> Int. Symposium on Pharmaceutical and Biomedical Analysis, 13-16 November 2016, Guangzhou (China).
25. MedLem16 meeting, 17 November 2016, Geneva (Switzerland).
26. SCAHT Retreat, 1-2 December, 2016, Neuchâtel (Switzerland).

## CONTINUING EDUCATION & OPEN TO THE PUBLIC LECTURES

1. S. RUDAZ. Targeted and Untargeted Analysis of Maturation Dependent Adverse effects of Paraquat Exposure in 3D Rat Brain Cell Cultures. Sytem Toxicology 2016, 27-29 January, 2016, Les Diablerets (Switzerland).
2. D. GUILLARME. Les particules superficiellement poreuses (core-shell, fused-core) : évolution ou révolution. Interchim, January 2016, Montluçon (France).
3. J. SCHAPPLER. Master "Contrôle et Analyse", University Claude Bernard Lyon 1, Lyon, France. Validation des méthodes analytiques (12h); in the course: Qualification et validation. January 2016, Lyon (France).
4. S. RUDAZ. Untargeted is the Target. Department of Physiology, University of Lausanne, February 1, 2016, Lausanne (Switzerland).
5. S. RUDAZ. Untargeted Analysis, from raw data to biomarkers\* Inauguration of the Faculty Centre of Translational Investigation in Biomarkers – 1<sup>st</sup> Biomarker Day, University of Geneva, March 6<sup>th</sup>, 2016, Geneva (Switzerland).
6. D. GUILLARME. Introduction à la chromatographie en phase liquide (HPLC) (1 day). CCCTA course, March 2016, Geneva (Switzerland).
7. J. SCHAPPLER, S. RUDAZ. Validation des méthodes analytiques (12h). CCCTA, March 2106, Geneva (Switzerland).
8. J. BOCCARD, S. RUDAZ. Principes de base en méthodologie – calculs statistiques. ccCTA course, 21 March, 2016, Geneva (Switzerland).
9. S. RUDAZ. New insights in capillary electrophoresis for counterfeit detection and substandard drug quality control. Club Lyonnais de Chromatographie Liquide – Forum Labo, 31 March, 2016, Lyon (France).
10. M. SARRUT, S. FEKETE, M.C. JANIN-BUSSAT, A. CORGIER, D. GUILLARME, A. BECK, J.L. VEUTHEY, S. HEINISCH. 2D chromatographic approach for the characterization of antibody-drug conjugates. Waters ADC symposium – April 2016, Manchester (United Kingdom).
11. D. GUILLARME. Choix technologiques et développement de méthodes en HPLC (2 days). CCCTA course, April 2016, Geneva (Switzerland).
12. D. GUILLARME. Recent trends in liquid chromatography. Lab Innovations - April 2016, Lausanne (Switzerland).
13. D. GUILLARME. La recherche académique en Suisse: parcours personnel et projets de recherche actuels. Ecole doctorale, April 2016, Strasbourg (France).
14. S. RUDAZ, J. SCHAPPLER. Préparation de l'échantillon liquide (6h). CCCTA, April 2106, Geneva (Switzerland).
15. S. RUDAZ, J. BOCCARD. Initiation aux méthodes d'analyse multivariée en sciences pharmaceutiques. School of Pharmaceutical Sciences doctoral program, 11-12 April, 2016, Geneva (Switzerland).
16. S. RUDAZ. Differentiation of lemon essential oil based on various analytical techniques: a multiblock metabolomics approach. Leiden University, 21 April, 2016, Leiden (The Netherlands).

17. S. RUDAZ. Pratique des plans d'expérience, une introduction. Université Cheikh Anta Diop, 29 April – 7 May, 2016, Dakar (Sénégal).
18. S. RUDAZ. Validation des methods analytiques. Université Cheikh Anta Diop, 29 April – 7 May, 2016, Dakar (Sénégal).
19. S. RUDAZ. Métabolomique et Chimiométrie, de quoi parle-t'on? Potentiel et perspective en Chimie Médicinale. Conférence Publique, Université Cheikh Anta Diop, 3 May 3, 2016. Dakar (Sénégal).
20. S. RUDAZ. Intérêt et défi du profil stéroïdien. Journée afabs, Formation continue en Biologie Spécialisée, Méthodes "omics" en médecine de Laboratoire, intérêt d'une approche globale, 12 May, 2016, Montreux (Suisse).
21. S. RUDAZ. Cours analytique en sciences pharmaceutiques, un cursus revisité à l'Université de Genève. Association Francophone des Enseignants en Chimie Analytique et Biologique (AFECAB), June 2016, Nantes (France).
22. S. RUDAZ. Human key event readouts related to male infertility and Steroidomic profiling in adrenal cell models. 5th SCAHT Science Advisory Board Meeting, July 5-6, 2016, Bern (Switzerland).
23. J. BOCCARD, S. RUDAZ. Metabolomic profiles induced by neuroinflammatory conditions. 5th SCAHT Science Advisory Board Meeting, July 5-6, 2016, Bern (Switzerland).
24. S. RUDAZ. Contrefaçons médicamenteuses: le projet Pharmelp. Formation continue EPGL / PharmaGenève, 27 September. 2016, Geneva (Switzerland).
25. S. RUDAZ. Use and misuses of accuracy profiles for results uncertainty. Journée sur l'incertitude de mesure. Société des sciences et techniques pharmaceutiques, Maison de la Chimie, 7 October, 2016, Paris (France).
26. S. RUDAZ. Low cost capillary electrophoresis system for counterfeits detection. Recent events in energy seminar series, EPFL Valais, 3 November, 2016, Sion (Switzerland).
27. J.L. VEUTHEY. Les biopharmaceutiques: un challenge en analyse pharmaceutique. Ecole doctorale de l'Université libre de Bruxelles, 11 May, 2016, Bruxelles (Belgium).
28. J.L. VEUTHEY. L'analyse anti-dopage: une course perdue d'avance? Club du Lundi, 6 June, 2016, Geneva (Switzerland).
29. J.L. VEUTHEY. Historique du centre de competence en chimie et toxicology analytiques ccTA. 20èmes Journées scientifiques du CCCTA, 15-16 September, 2016, Les Diablerets (Switzerland).
30. J.L. VEUTHEY. New insights in chromatography in pharmaceutical analysis. Journées scientifiques 2016 de la plateforme en biologie-santé protéomique et spectrométrie de masse de l'Université de Lille, 9 November 2016, Lille (France).

## THESIS PRESENTED

### INTRA-MUROS THESIS

Lionel SACCONNAY.

In silico-driven strategies for the identification of novel sirtuin modulators

University of Geneva - 2016-

Thesis N° 4904

Directors: P.-A. CARRUPT, J.-L. VEUTHEY. A. NURISSO

Ameena JESAIMANI.

The use of Internet for health information by hospitalized patients in Switzerland and Qatar.

University of Geneva – 2016 –

Thesis N° 4920

Directors: P. DAYER, J.-L. VEUTHEY.



Stéphanie ROMAND.  
Nouvelles approches in vitro pour l'étude de la physico-chimie et du métabolisme de phase II de  
composés pharmaceutiques.  
University of Geneva – 2016 –  
Thesis N° 4975  
Directors: P.-A. CARRUPT, S. RUDAZ

## THESIS JURY

Myriam MORGATTA.  
Master of Advanced Studies in Toxicology.  
What is known on disinfectants used in hospitals and potentially released in wastewaters?  
The case of two Swiss university hospitals.  
Scientific direction: Dr. N. Chèvre, Lausanne University, Switzerland.  
Jury member: S. RUDAZ

Lionel SACCONAY.  
PhD.  
In silico-driven strategies for the identification of novel sirtuin modulators.  
Scientific Direction: J.-L. VEUTHEY, P. A. CARRUPT, A. NURISSO, Geneva University, Switzerland.  
Jury member: S. RUDAZ

Miguel DE FIGUEIROS.  
PhD.  
First year qualification for Ph.D. thesis Évaluation de la contribution des méthodes  
chimométriques pour l'inférence de source et la comparaison de profils chromatographiques de  
liquids inflammables.  
Scientific direction: D. Rutledge, AgroParisTech, Paris (France).  
Jury member: S. RUDAZ

Emmanuelle BICHON.  
PhD.  
Challenge de l'analyse de dangers chimiques à l'état d'ultra-traces en matrices biologiques  
complexes.  
Scientific direction: Prof. B. Le Bizec, Laberca, University of Nantes (France).  
Jury member: S. RUDAZ

Benjamin THIOMBIANO.  
PhD.  
Etude du métabolisme des phénylpropanoïdes au cours de la germination de la graine de lin.  
Scientific direction: R. Dauwe, F. Mesnard, University of Picardie, Amiens (France).  
Jury member: S. RUDAZ

François LESTREMEAU.  
HDR  
Evaluation et développement de méthodologies analytiques pour la mesure de composés  
organiques dans le domaine de l'environnement et de la santé.  
Scientific direction: H. Budzinski, University of Bordeaux (France).  
Jury member: D. GUILLARME

Yannis N. FRANCOIS.  
HDR.  
Développement du couplage électrophorèse capillaire – spectrométrie de masse: applications à la  
caractérisation fine de protéines.  
Scientific direction: E. Leize-Wagner, University of Strasbourg (France).  
Jury member: D. GUILLARME



Vincent ZWICK.

PhD.

HDAC inhibitors from natural and synthetic libraries: towards the development of biochemical probes.

Scientific direction: M. CUENDET, P-A. CARRUPT, University of Geneva.

Jury member : J.-L VEUTHEY

Morgan SARRUT.

PhD.

Optimisation de methods bidimensionnelles en ligne LCxLC-UV/MS et LCxSFC-UV pour l'analyse d'échantillons complexes.

Scientific direction: S. Heinisch, University Claude Bernard.

Jury member: J.-L VEUTHEY.

Mélanie MIGNOT.

PhD.

Elaboration de phases stationnaires originales pour la chromatographie liquide haute performance: synthèse, caractérisation, et évaluation des propriétés chromatographiques des colonnes.

Scientific direction: V. Peulon-Agasse, P. Cardinael, University of Rouen.

Jury member: J.-L VEUTHEY

Amandine DISPAS.

PhD.

Supercritical fluid chromatography for pharmaceutical analysis: new perspectives.

Scientific direction: Ph. Hubert, University of Liège.

Jury member: J.-L VEUTHEY.

Anthon HEEMSKERK.

PhD.

Exploring the proteome by CE-ESI-MS.

Scientific direction: A. Deelder, O. Mayboroda, Leiden University.

Jury member: J. SCHAPPLER

## RADIO TELEVISION INTERVENTION

Julie SCHAPPLER.

PharmaShow, AESP. 1<sup>st</sup> November 2016.

## AWARDS & DISTINCTIONS

F. MEHL, F. PONZETTO, R. NICOLI, N. BAUME, M. SAUGY, J. BOCCARD, S. RUDAZ. Award for excellence in poster presentation, 1<sup>st</sup> prize.

Longitudinal monitoring of endogenous steroids in human serum by UHPLC-MS/MS as a tool to detect testosterone abuse in sport. Chimie VII, Namur, Belgium, 18-20 January, 2016.

F. JEANNERET, J. SANDSTRÖM VON TOBEL, J. BOCCARD, F. MONNET-TSCHUDI, S. RUDAZ. Outstanding posters selected for oral presentation.

Targeted- and untargeted analysis of maturation dependent adverse effects of paraquat exposure in 3D rat brain cell cultures. Systems Toxicology, 27-29 January, 2016, Les Diablerets (Switzerland).

N. DROUIN, S. RUDAZ, J. SCHAPPLER. Best poster award, MSB 2016

Dynamic electromembrane extraction (d-EME): a new technical development 32<sup>nd</sup> International Symposium on Microscale Separations and Bioanalysis (MSB 2016), 3-7 April 2016, Niagara-on-the-Lake (Canada).

L. NOVAKOVA, V. DESFONTAINE, F. PONZETTO, R. NICOLI, M. SAUGY, J. L. VEUTHEY, D. GUILLARME.

Best poster award, 3<sup>rd</sup> prize. Innovations in pharmaceutical analysis. UHPSFC-MS/MS as a viable option in doping control analysis. HPLC 2016, 19-24 June 2016, San Francisco (USA).

M. SARRUT, A. CORGIER, S. FEKETE, A. BECK, D. GUILLARME, S. HEINISCH. Award for excellence in poster presentation, 1<sup>st</sup> prize. Optimization of conditions for the analysis of ADCs by on-line HIC x RPLC-UV/MS. HTC-14, January 2016, Ghent (Belgium).

A. AZZOLLINI, L. BOGGIA, J. BOCCARD, B. SGORBINI, N. LECOULTRE, P. RUBIOLO, S. RUDAZ, K. GINDRO, C. BICCHI, J. L. WOLFENDER. Best poster award, 1<sup>st</sup> prize. Detection and dynamics of volatile/non-volatile metabolite induction in a fungal co-culture through a miniaturised MS-based metabolomic approach. 9<sup>th</sup> Joint Natural Products Conference, 25-27 July, 2016, Copenhagen (Denmark).

E.A. DIOP, E. REGINATO, C. ROHRBASSER, P. BONNABRY, S. RUDAZ, J. SCHAPPLER. Swiss Academy of Pharmaceutical Sciences - Award for excellence in poster presentation Prize, 1<sup>st</sup> price. Low-cost capillary electrophoresis for counterfeits detection and sub-standard drugs quality control. 9<sup>th</sup> Swiss Pharma Science Day, 31 August 2016, Bern (Switzerland).

N. MARSOUSI, Y. DAALI, P. FONTANA, S. RUDAZ, C. SAMER, J. DESMEULES. Poster presentation, 1<sup>st</sup> price Coadministration of ticagrelor and ritonavir. Toward prospective dose adjustment to maintain an optimal platelet inhibition using the PBPK approach. MedLem16 meeting, 17th November 2016, Geneva (Switzerland).

J. SCHAPPLER, E. A. DIOP, E. REGINATO, C. ROHRBASSER, P. BONNABRY, S. RUDAZ. 2016 Award for excellence in poster presentation Prize, 3<sup>rd</sup> price (ex-aequo). Development of a low-cost analytical strategy for the detection of counterfeits and sub-standards medicines in emerging countries. 27<sup>th</sup> Int. Symposium on Pharmaceutical and Biomedical Analysis, 13th to 16th November, 2016 Guangzhou (China).

Y. GAGNEBIN, D. TONOLI, P. LESCUYER, B. PONTE, S. DE SEIGNEUX, P. Y. MARTIN, J. SCHAPPLER, J. BOCCARD, S. RUDAZ. Award for excellence in poster presentation Prize, 3<sup>rd</sup> price (ex-aequo) Metabolomic analysis of urine samples by UHPLC-QTOF-MS: impact of normalization strategies. 27<sup>th</sup> Int. Symposium on Pharmaceutical and Biomedical Analysis, 13<sup>th</sup> to 16<sup>th</sup> November, 2016 Guangzhou (China).

# PHARMACEUTICAL BIOCHEMISTRY



## PROFESSOR YOGESHVAR KALIA

## PROFESSOR LEONARDO SCAPOZZA

### GENERAL DESCRIPTION OF THE UNIT

The Pharmaceutical Biochemistry group includes two distinct fields of research linked to molecular therapeutics discovery and delivery.

The first is the Pharmaceutical Biochemistry/Chemistry field in which the research is focused on understanding ligand-macromolecule interactions to develop new therapeutic strategies including new chemical entities, new targets using an interdisciplinary approach based on the combination of Biochemistry/Biophysics and Chemistry with Computational Chemistry/Molecular Modelling. Additionally an *in vivo* activity in the field of rare disease has been added in order to be able to do preclinical Proof of Concept.

The second is in the field of drug delivery and focuses on the topical and transdermal delivery of therapeutic agents by investigating the effect of molecular properties on both passive and active transport processes. In addition, innovative approaches to increase the range of therapeutic agents that can be delivered across the skin and so provide new treatment options are also investigated.

### SPECIFIC RESEARCH FIELDS

The research in the field of pharmaceutical biochemistry/chemistry covers three main topics, namely Cancer, Neglected Diseases, Rare Diseases and Antibiotics Research.

- In Cancer Research we have two main objectives, namely the development of a thymidine kinase based safety and monitoring tool for stem cells therapy and the development of inhibitors of the tyrosine kinase domain of oncogenic fusion proteins involved in signalling pathways.
- Within the research area of Neglected Diseases and Rare Diseases we aim at elucidating and validating new potential drug targets for developing therapeutic strategies against orphan diseases e.g. dystrophy/SMA and the major parasitic diseases of the Third World e.g. Malaria, Tripanosomiasis and Leishmaniosis as well as finding potential lead compounds against such diseases.
- Within the area of Antibiotic Research the objective is to find compounds inhibiting bacterial virulence with novel mechanisms of action.

Further minor activities based on molecular recognition-based approaches for improving antibody formulation are on-going.

The research in the field of cutaneous drug delivery includes:

- Development of new formulations to increase local and systemic bioavailability of topical and transdermal therapeutics.
- Investigation of the influence of physicochemical properties on electrically-assisted transport across the skin.
- Synthesis and characterisation of prodrugs optimised for transdermal iontophoretic administration.
- Development of new techniques for the non-invasive delivery of biotechnology-derived therapeutics across the skin ("pharmaceutical biotechnology").
- Evaluation of dermal exposure, risk assessment and the development of predictive mathematical models.
- Investigation of new therapeutic applications.

## 2016 AT A GLANCE

Publications with impact factor	21
Posters presentations	15
Congresses & Symposia	18
Number of projects at FNRS and assimilated	4
Projects of collaboration with the industry	4
Ph.D. Thesis presented in 2016	3

## STAFF

### SENIOR LECTURER

Remo PEROZZO

### SENIOR RESEARCH ASSOCIATE

Olivier DORCHIES  
Thibaut De SMEDT

Béatrice KAUFMANN  
Oscar VADAS

### SENIOR RESEARCH AND TEACHING ASSISTANTS

Laurence NEFF  
Sébastien TARDY

Magali ZEISSER

### POSTDOCTORAL SCHOLARS

Yvonne ARNOLD  
Sergio DEL RIO SANCHO  
Amparo GARCIA LOPEZ  
Hesham HAMED

Maria LAPTEVA  
Cesar SERNA JIMENEZ  
Andréja VUJICIC ZAGAR

### RESEARCH AND TEACHING ASSISTANTS

Chiara AMBUEHL  
Naoual DAHMANA  
Elinam GAYI  
Si GOU  
Somnath KANDEKAR

Verena SANTER  
Francesca TESSARO  
Mayank SINGHAL  
Vegunta YOGHESH  
Tyagi VASUNDHARA

### INTERNSHIP STUDENTS – CO-SUPERVISION (CO-TUTELLE)

Laura CURTI  
Giuseppina PISIGNANO

Cecilia DALLAVALLE  
Withney SHATZ

### ADMINISTRATIVE STAFF

Nathalie GOFFIN

### TECHNICAL STAFF

Aurélie BAGUET  
Samuel EPSY (*apprentice*)  
Sylvie GUINCHARD  
Aurélie GOUILLER  
Benjamin KIENNING (*apprentice*)

Ophélie PATTHEY-VUADENS  
Olivier PETERMANN  
Barbara PINHEIRO  
Valentina RIGAUD (*apprentice*)  
Djehna SCALDINO (*apprentice*)  
Mathias YOBOUET (*apprentice*)

## RESEARCH FUNDS

### SWISS NATIONAL SCIENCE FOUNDATION

How kinases define specificity in lipid signalling? (SNF PZ00P3\_148269/1 Ambizione)

Main applicant: O. VADAS

Co-applicant: L. SCAPOZZA

Total funding : CHF 600'000.-

Allocation 2016: CHF 195'410.-

Duration: 3 years

Starting date: 1.1.2014

### EU FUNDING

Scaffolds for alternative delivery (SADEL) (FP7-HEALTH-2011)

Main applicant: L. SCAPOZZA

Total funding : Euro 643'544.-

Allocation 2016: CHF 0.-

Duration: 5 years

Starting date: 1.1.2012

### CTI

CTI-19086.1 PFLS.LS: "Spironolactone-Apidsol formulation for delayed healing of minor wounds in glucocorticoid treated patients"

Main applicant: Y. KALIA

Total funding : CHF 105'033.--

Allocation 2016: CHF 63'020.--

Duration: 2 years

Starting date: 1.7.2016

CTI-18283.1 AIDD-A2A: "ADENOSINE A2A receptor positive allosteric modulators (PAM) as a novel broadly applicable oral anti-inflammatory therapy"

Main applicant: L.SCAPOZZA

Total funding : CHF 219'248.--

Allocation 2016: CHF 155'404.-- + AIDD : CHF 24'992.--DEMO

Duration: 1 year

Starting date: 1.1.16

### FOUNDATIONS

Using RNA secondary structure as a therapeutic target for Spinal Muscular Atrophy: a new drug discovery approach. Fondation SMA Europe

Main applicant: L. SCAPOZZA

Total funding : CHF 124'209.-

Allocation 2016: CHF 65'746.--

Duration: 2 years

Starting date: 1.1.2015

Investigations on tamoxifen and the roles of estrogen receptors in mouse models of muscular dystrophies.

Foundation DPP-NL

Main applicant: L. SCAPOZZA and O. Dorchies

Total funding : CHF 263'237.-

Allocation 2016: CHF 70'387.--

Duration: 2.5 years

Starting date: 1.7.2014

Enhancing estrogenic signalling to fight devastating muscular dystrophies: Mechanisms of action and repurposing estrogenic drugs approved for Human use. Foundation AFM-Téléthon

Main applicant: L. SCAPOZZA and O. Dorchies

Total funding : CHF 159'570.-

Allocation 2016: CHF 0.-

Duration: 3 years

Starting date: 1.9.2014

Protective effects and mechanisms of action of tamoxifen in mice with severe muscular diseases. Fondation Suisse de recherché sur les maladies musculaires

Main applicant: L. SCAPOZZA and O. Dorchies

Total funding : CHF 195'780.-

Allocation 2016: CHF 63'880.-

Duration: 2 years

Starting date: 1.1.2014

## INDUSTRY AND ASSIMILATED

Code	Service - Development - Research	Total Amount for 2016 (CHF)
Ind-1	R&D	97'461.-
Ind-2	R&D	19'556.-
Ind-3	R&D	7'401.-
Ind-4	R&D	16'511.-
Ind-5	R&D	53'292.-
Coll-6	R&D	38'522.-
Coll-7	R&D	38'564.-
Coll-8	R&D	13'029.-
Coll-9	R&D	15'350.-
	TOTAL	299'686.-

## DEVICES IN LEND

DEVICE	ENTERPRISE /LABORATORY	LENDING PERIOD	LOCALISATION	INSURANCE CONTRAT
FDSS /microcell- Hamamatsu	Alpine Institute for Drug Discovery SA / Institut for Arthritis Research	01.09.2014-	CMU B07.1519	

## PUBLICATIONS

### THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

Cancer Res.	7.86
J. Biol. Chem.	4.77
J. Med. Chem.	5.25
Cancer Gene Ther.	2.80
Proteins	3.39
Biochemistry-US	3.42
Protein Sci.	2.80
J. Chem. Inf. Model	4.68
Protein Express. Purif.	1.59
J. Mol. Model	1.80

## SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)

1. L. SLEPIKAS, G. CHIRIANO, R. PEROZZO, S. TARDY, A. KRANJC, O. PATTHEY-VUADENS, H. OUERTATANI-SAKOUHI, S. KICKA, C. F. HARRISON, T. SCRIGNARI, K. PERRON, H. HILBI, T. SOLDATI, P. COSSON, E. TARASEVICIUS, L. SCAPOZZA: "In Silico Driven Design and Synthesis of Rhodanine Derivatives as Novel Antibacterials Targeting the Enoyl Reductase InhA", *J. Med. Chem.*, 59, 10917-10928 (2016). 5.59
2. S. SOTIRIOU, I. KAMILERI, N. LUGLI, K. EVANGELOU, C. DA-RE, F. HUBER, L. PADAYACHY, S. TARDY, N. L. NICATI, S. BARRIOT, F. OCHS, C. LUKAS, J. LUKAS, V. GORGOLIS, L. SCAPOZZA, T. HALAZONETIS, "Mammalian RAD52 Functions in Break-Induced Replication Repair of Collapsed DNA Replication Forks." *Molecular Cell*, 64 (6), 1127-1134 (2016). 13.96
3. E. GAYI, H. ISMAIL, L. NEFF, A. PATTHEY-VUADENS, K. TODA, U. RUEGG, L. SCAPOZZA, O. DORCHIES: "Lack of estrogens impairs motor function and muscle structure in dystrophic mice", *Neuromusc. Disord.*, 26, S130-S130 (2016). 2.97
4. L. NEFF, E. GAYI, L. SCAPOZZA, O. DORCHIES: "PCR-restriction-based strategies allow genotyping without sequencing of several allelic variants of the mdx mouse that carry point mutations", *Neuromusc. Disord.*, 26, S127-S127 (2016). 2.97
5. L. NEFF, L. SCAPOZZA, O. DORCHIES: "Toward generating new dystrophic mouse mutants by homologous recombination using dimeric RNA-guided FokI-dCas9 nucleases", *Neuromusc. Disord.*, 26, S127-S127 (2016). 2.97
6. C. REICHERT, R. PEROZZO, G. BORCHARD: "Non-covalent modification of granulocyte-colony stimulating factor (G-CSF) by coiled-coil technology", *International Journal of Pharmaceutics* 511, 98-103 (2016) 3.06
7. D. ALBINO, G. CIVENNI, C. DALLAVALLE\*, M. ROOS, H. JAHNS, L. CURTI, S. ROSSI, S. PINTON, G. D'AMBROSIO, F. SESSA, J. HALL, C. V. CATAPANO, G. M. CARBONE, "Activation of the Lin28/let-7 Axis by Loss of ESE3/EHF Promotes a Tumorigenic and Stem-like Phenotype in Prostate Cancer". *Cancer Research*, 76 (12), 3629-3643 (2016). 9.12  
\* *L Scapozza co-director of the thesis at EPGL*
8. D. ALBINO, G. CIVENNI, C. DALLAVALLE\*, M. ROOS, H. JAHNS, J. HALL, G. M. CARBONE, C. V. CATAPANO, "Targeting the Lin28A/B axis reverts stem cell-like phenotype and tumor-initiating properties in prostate cancer." *Cancer Research*, 76 (14 Supplement) 3343-3343; DOI:10.1158/1538-7445 (2016). 9.12  
\* *L Scapozza co-director of the thesis at EPGL*
9. G. M. CARBONE, L. CURTI\*, M. ZOMA, A. MITRA, D. SHINDE, D. ALBINO, S. ROSSI, G. CIVENNI, G. THALMANN, G. CHIORINO, C. CATAPANO, "EZH2-induced lysine methylation and ERG-EZH2 genomic co-occupancy set the basis for extensive transcriptome reprogramming and prostate cancer progression." *Cancer Research*, 76 (14 Supplement) LB-152-LB-152; DOI:10.1158/1538-7445 (2016) 9.12  
\* *L Scapozza co-director of the thesis at EPGL*
10. G. CIVENNI, N. LONGONI\*, P. COSTALES, C. DALLAVALLE\*, C. G. INCLAN, D. ALBINO, L. E. NUNEZ, F. MORIS, G. M. CARBONE, C. V. CATAPANO, "EC-70124, a Novel Glycosylated Indolocarbazole Multikinase Inhibitor, Reverts Tumorigenic and Stem Cell Properties in Prostate Cancer by Inhibiting STAT3 and NF-kappa B." *Molecular Cancer Therapeutics*, 15 (5), 806-818 (2016) 4.97  
\* *L Scapozza co-director of the thesis at EPGL*
11. C. DALLAVALLE\*, D. ALBINO, G. CIVENNI, J. MERULLA, P. OSTANO, M. MELLO-GRAND, S. ROSSI, M. LOSA, G. D'AMBROSIO, F. SESSA, G. N. THALMANN, R. GARCIA-ESCUADERO, A. ZITELLA, G. CHIORINO, C.V. CATAPANO, G. M. CARBONE, "MicroRNA-424 impairs ubiquitination to activate STAT3 and promote prostate tumor progression." *Journal of Clinical Investigation*, 126 (12), 4585-4602 (2016). 12.57  
\* *L Scapozza co-director of the thesis at EPGL*



12. C. DALLAVALLE\*, G. THALMANN, C.V. CATAPANO, G.M.R. CARBONE, "The E3 ubiquitin ligase COP1 controls STAT3 turnover and its loss leads to increased STAT3 stabilization and activation in prostate cancer." *Cancer Research* 76 (14 Supplement) 4545-4545; DOI:10.1158/1538-7445 (2016) 9.12  
\* *L Scapozza co-director of the thesis at EPGL*
13. W. SHATZ\*, P. HASS, M. MATHIEU, H.S. KIM, K. LEACH, M. ZHOU, Y. CRAWFORD, A. SHEN, K. WANG, B. TO, M. MAIA, M. KENRICK, L. DICKMANN, J.M. SCHEER, R.F. KELLEY: « Production and Characterization of Rabbit Fab/Fab'as Surrogate Molecule Testing Long Acting Delivery Technologies. » *Molecular Pharmaceutics*. 13 2996-3003 (2016) 4.32  
\* *Y Kalia co-director of the thesis at EPGL*
14. J. CAZARES-DELGADILLO, A. GANEM-RONDERO, V. MERINO, Y. N. KALIA: "Controlled transdermal iontophoresis for poly-pharmacotherapy: Simultaneous delivery of granisetron, metoclopramide and dexamethasone sodium phosphate in vitro and in vivo", *Eur. J. Pharm. Sci.*, 85, 31-38 (2016). 3.77
15. Y. CHEN, I. ALBERTI, Y. N. KALIA: "Topical iontophoretic delivery of ionizable, biolabile aciclovir prodrugs: A rational approach to improve cutaneous bioavailability", *Eur. J. Pharm. Biopharm.*, 99, 103-113 (2016). 3.97
16. Y. CHEN, T. ZAHUI, I. ALBERTI, Y. N. KALIA: "Cutaneous biodistribution of ionizable, biolabile aciclovir prodrugs after short duration topical iontophoresis: Targeted intraepidermal drug delivery", *Eur. J. Pharm. Biopharm.*, 99, 94-102 (2016). 3.97
17. S. DEL RIO-SANCHO, D. CONCAS, P. ORESTE, G. ZOPPETTI, P. H. BRIGGS, Y. N. KALIA: "Topical delivery of diclofenac into and across equine skin from a novel liquid diclofenac epolamine formulation", *J. Vet. Pharmacol. Ther.*, 39, 578-583 (2016). 1.29
18. S. DEL RIO-SANCHO, V. MERINO, A. LOPEZ-CASTELLANO, Y. N. KALIA: "A UHPLC-UV Method to Quantify Skin Deposition and Transdermal Permeation of Tizanidine Hydrochloride", *J. Chromatogr. Sci.*, 54, 790-795 (2016). 1.32
19. D. GABRIEL, T. MUGNIER, H. COURTHION, K. KRANIDIOTI, N. KARAGIANNI, M. C. DENIS, M. LAPTEVA, Y. KALIA, M. MOLLER, R. GURNY: "Improved topical delivery of tacrolimus: A novel composite hydrogel formulation for the treatment of psoriasis", *J. Control. Release*, 242, 16-24 (2016). 7.44
20. M. SINGHAL, S. DEL RIO-SANCHO, K. SONAJE, Y. N. KALIA: "Fractional Laser Ablation for the Cutaneous Delivery of Triamcinolone Acetonide from Cryomilled Polymeric Microparticles: Creating Intraepidermal Drug Depots", *Mol. Pharm.*, 13, 500-511 (2016). 4.34
21. T. GRATIERI, V. SANTER and Y.N. KALIA: "Basic principles and current status of transcorneal and transscleral iontophoresis." *Expert Opinion on Drug Delivery*.1-12. 5.434 (2016) 3.48

## PRESENTATIONS

### POSTERS PRESENTATIONS

1. M. SINGHAL, S. DEL RÍO-SANCHO, K. SONAJE, and Y. N. KALIA Creating cutaneous drug depots using P.L.E.A.S.E.® fractional laser ablation. 30<sup>ème</sup> séminaire en sciences pharmaceutiques on molecular therapeutics – discovery, development and delivery, Zermatt, Switzerland, September 5-9, 2016
2. H. M. ISMAIL, N. ZANOU, G. SHAPOVALOV, M. KOVACS-STROSOVA, J. REUTENAUER-PATTE, E. ROULET, A. DIETRICH, L. BIRNBAUMER, L. SCAPOZZA, P. GAILLY, U. T. RUEGG, O. M. DORCHIES. Lack of TRPC1 cation channels enhances muscle fatigue in mdx5Cv dystrophic mice 5<sup>th</sup> international congress of Myology, Lyon, France, March 14<sup>th</sup> -18<sup>th</sup> 2016
3. H. M. ISMAIL, L. SCAPOZZA, U. T. RUEGG, O. M. DORCHIES. Diapocynin, a putative NADPH oxidase inhibitor, ameliorates the phenotype of a mouse model of Duchenne muscular dystrophy 5<sup>th</sup> international congress of Myology, Lyon, France, March 14<sup>th</sup> -18<sup>th</sup> 2016

4. H. M. ISMAIL, O. M. DORCHIES, A. SLADE, F. PORTE-THOME, L. SCAPOZZA. Rimeporide restores resting pH and decreases store operated calcium entry in dystrophic myotubes by inhibiting sodium hydrogen exchanger type 1 (NHE 1) 5<sup>th</sup> international congress of Myology, Lyon, France, March 14<sup>th</sup> -18<sup>th</sup> 2016
5. H. M. ISMAIL, O. M. DORCHIES, A. SLADE, F. PORTE-THOME, L. SCAPOZZA. Rimeporide restores resting pH and decreases store operated calcium entry in dystrophic myotubes by inhibiting sodium hydrogen exchanger type 1 (NHE 1) Swiss Society of Pharmacology and Toxicology annual meeting, Bern, Switzerland, April 21<sup>st</sup> 2016
6. C. DALLAVALLE, G. THALMANN, C. V. CATAPANO, G. M. CARBONE. The E3 ubiquitin ligase COP1 controls STAT3 turnover and its loss leads to increased STAT3 stabilization and activation in prostate cancer- AACR, New Orleans, April 16-20, 2016
7. S. G. KANDEKAR, M. SINGHAL, K. SONAJE, C. SERNA, M. LAPTEVA, Y. N. KALIA. Nanocarrier mediated topical delivery of vismodegib: a targeted approach for the treatment of basal cell carcinoma, 14<sup>th</sup> European Symposium on Controlled Drug Delivery, Egmond aan Zee, The Netherlands, April 13-15, 2016
8. V. SANTER, S. DE RIO SANCHO, Y. N. KALIA. Iontophoresis of triamcinolone acetonide amino acid ester prodrugs for increased intracorneal drug biodistribution, 14<sup>th</sup> European Symposium on Controlled Drug Delivery, Egmond aan Zee, The Netherlands, April 13-15, 2016
9. V. SANTER, Y. N. KALIA. Novel biodegradable triamcinolone acetonide prodrugs for iontophoretic delivery into the posterior eye segment, 4<sup>th</sup> Conference on Innovation in Drug Delivery: Site-Specific Drug Delivery, Antibes –Juan Les Pins, France, September 25-28, 2016
10. S. DEL RÍO-SANCHO, C. CROS, B. COUTAZ, M. CUENDET, Y. N. KALIA. Short duration iontophoresis for targeted topical peptide delivery into the skin, Emerging Therapeutics Summit, Melbourne, Australia, November 23-25, 2016
11. Y. CHEN, V. SANTER, Y. N. KALIA. Using ex vivo/in vivo animal models to investigate local drug delivery to the human eye. 13<sup>th</sup> International Symposium on Ocular Pharmacology and Therapeutics (ISOPT Clinical, Rome, Italy), December 1-3, 2016
12. D. GABRIEL, A. NIEDERER, T. MUGNIER, N. DAHMANA, V. SANTER, Y. N. KALIA, R. GURNY. Antifungal treatment: What drug delivery strategy, 13<sup>th</sup> International Symposium on Ocular Pharmacology and Therapeutics (ISOPT Clinical), Rome, Italy, December 1-3, 2016
13. V. SANTER, S. DE RIO SANCHO, Y. N. KALIA. Iontophoresis of triamcinolone acetonide amino acid ester prodrugs for increased intracorneal drug biodistribution, 30<sup>ème</sup> Séminaire en Sciences Pharmaceutiques, Molecular Therapeutics-Discovery, Development and Delivery, Zermatt, Switzerland, September 5-9, 2016.
14. M. CINIER, M. ZEISSER LABOUEBE, C. ROUSSEAU, R. CASTRO, A. CUNHA, N. TRUONG TAN, R. GURNY, L. SCAPOZZA, O. KITTEN. Oral delivery of Nanofitins targeting TNF-alpha shows a strong preventive and curative anti-inflammatory effect in models of inflammatory bowel diseases. - 8<sup>th</sup> PEGS Europe Protein & Antibody Engineering Summit, Lisbon, Portugal, October 31-November 4, 2016
15. M. CINIER, M. ZEISSER LABOUEBE, C. ROUSSEAU, R. CASTRO, A. CUNHA, N. TRUONG TAN, R. GURNY, L. SCAPOZZA, O. KITTEN. Oral delivery of a new class of non-antibody protein scaffold Nanofitins targeting TNF $\alpha$  shows a strong preventive and curative anti-inflammatory effect in models of IBD. – SANOFI FRANCE R&D Science days 2016, Le port Marly, France, March 25<sup>th</sup>, 2016

## CONGRESSES & SYMPOSIA

1. S. G. KANDEKAR Nanocarrier mediated topical delivery of vismodegib: a targeted approach for the treatment of basal cell carcinoma, 30<sup>ème</sup> séminaire en sciences pharmaceutiques, Molecular Therapeutics – Discovery, Development and Delivery, Zermatt, Switzerland, September 5 - 9, 2016
2. M. ZEISSER LABOUEBE, M. CINIER, C. ROUSSEAU, R. CASTRO, A. CUNHA, N. TRUONG TAN, R. GURNY, L. SCAPOZZA, O. KITTEN SADEL. Project: Scaffolds for Alternative Delivery, 11<sup>th</sup> congress of ECCO-EU Project Forum, Amsterdam, The Netherlands, March 16-19, 2016

3. N. DAHMANA. Controlled release polymer for ocular intravitreal delivery of spironolactone: in vitro characterization and in vivo tolerance in rats, 4<sup>th</sup> Congress on Innovation in Drug Delivery, Antibes - Juan-les-pins, France , September 25-28, 2016.
4. W. SHATZ. Developing Protein-polymer Conjugates as a Candidate for Long Acting Delivery to the Eye, PEGS, Boston, USA, April 2016
5. W. SHATZ. Developing a Protein-polymer Conjugate as a Candidate for Long Acting Delivery to the Eye, Molecular Therapeutics Offsite, Zermatt, Switzerland, September 2016
6. W. SHATZ Expanding the Realm of Ocular Drug Delivery using Protein-polymer Conjugates , Peptide Drug Design and Delivery Summit, San Francisco, USA, December 2016
7. O. VADAS. Structural insights into phosphoinositide 3-kinases (PI3Ks) regulation" LS2 meeting, Lausanne, February 15-16, 2016
8. O. VADAS. Class II phosphoinositide 3-kinases (PI3Ks) regulation and cellular functions: from protein to cell" ERC starting grant selection, Bruxelles (Belgium), June 7, 2016
9. H. M. ISMAIL. Therapeutic effectiveness of Rimeporide, an NHE-1 inhibitor, from muscle cells in culture to models of Duchenne muscular dystrophy, 11<sup>th</sup> Swiss Meeting on Muscle Research, Macolin, Switzerland 22<sup>nd</sup> November 2016
10. M. SINGHAL, S. DE RIO SANCHO, Y. N. KALIA. Creating cutaneous drug depots using P.L.E.A.S.E.<sup>®</sup> fractional laser ablation, 15<sup>th</sup> Annual Meeting of Skin Forum., London, United Kingdom, June 21-22, 2016.
11. C. E. SERNA JIMÉNEZ, I. ALBERTI, A. LÓPEZ CASTELLANO, V. MERINO, Y. N. KALIA. Evaluation of fractional laser ablation for the controlled transdermal delivery of paliperidone and the development of a mathematical model for laser-assisted drug transport. Controlled Release Society Annual Meeting & Exposition 2016, Seattle, USA, July 17-20, 2016.
12. C. E. SERNA JIMÉNEZ, Y. CHEN, S. KANDEKAR, V. SANTER, Y. N. KALIA. Controlled anodal iontophoretic delivery of biolabile hydrosoluble raloxifen prodrugs, Controlled Release Society Annual Meeting & Exposition 2016, Seattle, USA, July 17-20, 2016
13. Y. N. KALIA. Moving proteins across biological barriers: Effect of physicochemical properties on controlled non-invasive iontophoretic delivery. Multidisciplinary Molecular Biology Workshop: New Insights of Peptides and Proteins, Geneva, Switzerland, July 22-25, 2016
14. N. DAHMANA, L. KOWALCZUK, D. GABRIEL, F. BEHAR-COHEN, R. GURNY, Y. N. KALIA. hexPLA polymer for sustained release of spironolactone: characterization in vitro and ocular tolerance in rats in vivo, 4<sup>th</sup> Conference on Innovation in Drug Delivery: Site-Specific Drug Delivery, Antibes –Juan Les Pins, France, September 25-28, 2016.
15. Y. N. KALIA. Drug delivery into and across the skin: The art of the possible. Shanghai Jiao Tong University, Shanghai, China May 23, 2016.
16. Y. N. KALIA. Grandes molécules, petites pores – des thérapies topiques pour l'avenir, Swiss Society of Dermatology and Venereology: 98<sup>th</sup> annual meeting, Geneva, Switzerland, August 25-27, 2016.
17. Y. N. KALIA. Crossing biological barriers, 30<sup>ème</sup> Séminaire en sciences pharmaceutiques, Zermatt, Switzerland, September 5-9, 2016.
18. Y. N. KALIA. What is new in laser assisted drug delivery ?, 25<sup>th</sup> EADV CONGRESS: SS04 European Society for Laser Dermatology, Vienna, Austria, September 28 - Oct 2, 2016.

## CONTINUING EDUCATION & OPEN TO THE PUBLIC LECTURES

1. L. SCAPOZZA. Co-organizer of the Symposium entitled "Fortschritte in der Pharmakologie: Personalized Medicine" (ca 300 participants) January 28, 2016, Bern (Switzerland)
2. L. SCAPOZZA, O. STAUB. Organisation of the SSEP symposium within the LS<sup>2</sup> Annual meeting entitled "Pharmacology in the era of System Biology" (ca 300 participants) February 15-16, 2016, Lausanne (Switzerland)

## THESIS PRESENTED

### INTRA-MUROS THESIS

Laura CURTI

“EZH2 induces methylation of ERG enhancing its transcriptional and transforming activity”

Thesis n° 4913, University of Geneva

Director: L. SCAPOZZA

Co-director: G. CARBONE

March 11, 2016

Cecilia DALLAVALLE

“A novel oncogenic axis involving the ETS factor ESE3/EHF, miR-424, COP1 and STAT3 drives prostate tumor progression.”

Thesis n° 4950, University of Geneva

Director: L. SCAPOZZA

Co-director: G. CARBONE

July 4, 2016

Giuseppina PISIGNANO

“A non-coding RNA network influenced by genetic polymorphism controls E-cadherin expression in human cancers”

Thesis n° 5037, University of Geneva

Director: L. SCAPOZZA

Co-director: C. CATAPANO

December 7, 2016

# PHYTOCHEMISTRY AND BIOACTIVE NATURAL PRODUCTS



## PROFESSOR JEAN-LUC WOLFENDER

### GENERAL DESCRIPTION OF THE UNIT

The main research activities of the unit are related to the development of methodologies for the rapid isolation identification and bioactivity characterisation of natural products (NPs) at the microgram scale. State-of-the-art LC-MS and LC-MS/MS as well as microNMR techniques are used for dereplication purposes or de novo identification of NPs in crude extracts from different origins (plants, fungi, and microorganisms). Microfractionation methods in 96 well plates allow bioassays to be performed on LC peak in crude extracts, quantitative estimation of the well content and further structural determination by CapNMR. Rational large-scale isolation strategies are developed for the rapid obtention of pure NPs in the mg scale for further testing bioactivities and mode of action. The range of biological activities studied in house or in collaboration covers mainly antifungal, antiprotozoal, antiinflammatory and antiepileptic activities. The interest of the group is also focused on plant metabolomics, in this respect the focus is on the investigation of bioactive NPs dynamically induced in various stress situations (fungi confrontation, biotic and abiotic stresses, metabolite elicitation). With the idea to generate original sources of bioactive NPs, other strategies including biotransformation or chemical derivatisation of crude extracts from common sources are also investigated. Finally the analytical and metabolomics methods are also used for studying the metabolisation of crude extracts in view of a better understanding of the mode of action (synergy, prodrugs) and the potential toxicity of phytopharmaceuticals or nutraceuticals.

### SPECIFIC RESEARCH FIELDS

- Search for new lead compounds from natural sources
- On-line identification of natural products by LC-UV-NMR-MS (dereplication)
- Rapid microfractionation of crude extracts for chemical and bioactivity profiling
- Plant metabolomics
- Search for original bioactive stress-induced natural products of various origin
- Study of antifungal compounds from pathogen fungi in co-culture
- Qualitative quantitative analysis of phytotherapeutics
- Study of the metabolisation of phytopreparation by metabolomics in relation with their mode of action
- Investigation of natural products involved in diseases associated with problems of ageing
- Search for new lead compounds for use against tropical parasitic diseases
- Investigation of methods for isolation of natural products using preparative chromatographic techniques

### 2016 AT A GLANCE

Publications with impact factor	22
Publications without impact factor	1
Posters presentations	32
Congresses & Symposia	30
Number of projects at FNRS and assimilated	3
Projects of collaboration with the industry	6
Ph.D. Thesis presented in 2016	4

## STAFF

VISITING PROFESSOR	Miwa DOUNOUE	
SENIOR LECTURER	Emerson FERREIRA-QUEIROZ	
LECTURER	Elisabeth RIVARA MINTEN	
EXCELLENCE FELLOWSHIP	Nayara CORIOLANO Helena MANNOCHIO-RUSSO	Patricia de OLIVEIRA-FIGUEIREDO Shuaizhen ZHOU
POSTDOCTORAL SCHOLARS	Pierre-Marie ALLARD Paul COULERIE	Mariam MNATSAKANIAN
RESEARCH AND TEACHING ASSISTANTS	Adlin AFZAN Abdul-Elah ALFATTANI Antonio AZZOLLINI Théo BRILLATZ Soura CHALLAL (until 30.04.2015) Joëlle HOURIET	Quentin FAVRE-GODAL Daniel MAAG Vera OLDRATI Charlotte PETIT David RIGHI
INTERNSHIP STUDENTS – CO-SUPERVISION (CO-TUTELLE)	Assane DIOP	
TECHNICAL STAFF	Laurence MARCOURT	
ADMINISTRATIVE STAFF	Natalie SCHREGLE	

## RESEARCH FUNDS

### SWISS NATIONAL SCIENCE FOUNDATION

"Localisation and dynamics of free and bound 12-oxo-phytodienoic acid (OPDA) pools in Arabidopsis» (31003A\_163424 / 1)

Main Applicant: J.-L. WOLFENDER

Co-applicant: E. E. FARMER, UniL - G. GLAUSER, UniNE

Total funding: CHF 451'030. —

Allocation 2016: CHF 183'614.—

Duration: 3 years

Starting date: 2016

"NMR 600MHz for metabolomics and biomarker identification for life sciences, chemical biology and medical projects at the University of Geneva» (316030\_164095 1/1)

Main applicant: J.-L. WOLFENDER

Other beneficiaries/participants to the project:

UniGe : P. MAEHLER, Cellular physiology and Metabolism, Faculty of Medicine - N. VUILLEUMIER, DMGL

H. RIEZMAN, Biochemistry, Faculty of Sciences - L. LOPEZ-MOLINA, Vegetal Biology, Faculty of Sciences -

HUG : P.-Y. MARTIN, Nephrology, Intern Medicine - S. de SEIGNEUX MATTHEY, Nephrology, Intern Medicine

Total funding : CHF 809'460.—

Allocation 2016: CHF 809'460.—

Duration: 1 year

Starting date: 2016

"Study of leaf endophytic fungi: Exploration and valorization of biosourCed Innovative antibacterial metabolites" (310030E-164289 / 1)

Main applicant: D. STIEN, Laboratoire de Biodiversité et Biotechnologies Microbiennes, UMPC, Banyuls-sur-Mer, France

Co-applicant: J.-L. WOLFENDER - K. PERRON, UniGe

Co-applicant: J. CHAVE, University of Paul Sabatier, Toulouse, France

Co-applicant: V. EPARVIER, Institut de Chimie des Substances Naturelles, CNRS, Gif sur Yvette, France

Total funding : CHF 455'044. —

Allocation 2016: CHF 185'502. —

Duration: 3 years

Starting date: 2016

## SINO SWISS SCIENCE AND TECHNOLOGY COOPERATION - SSSTC

Collaboration between the School of Pharmaceutical Sciences of the University of Shandong and Geneva Sino Swiss Science and Technology Cooperation Program (SSSTC) IP18-092011

Main applicant: J.-L. WOLFENDER

Total funding: CHF 40'000.-

Allocation 2015: CHF 27'000.-

Duration: 1,5 years

Starting date: 2015

## EU FUNDS

"Novel natural products for healthy ageing from Mediterranean diet and food plants of other global sources" (H2020-MSCA-RISE-2015)

Main-applicant: UNIVERSITAET INNSBRUCK, Austria

Co-applicant: J.-L. WOLFENDER, UNIGE

Co-applicant: ETHNIKO KAI KAPODISTRIAKO PANEPISTIMIO, Athens, Greece

Co-applicant: UNIVERSITEIT ANTWERPEN, Antwerpen, Belgium

Co-applicant: EIDGENOESSISCHE TECHNISCHE HOCHSCHULE, Zurich, Switzerland

Co-applicant: BIONORICA RESEARCH GmbH, Innsbruck, Austria

Co-applicant: GALENICA SA, Kifissia, Greece

Co-applicant: VIVACELL BIOTECHNOLOGY GmbH, Cordoba, Spain

Co-applicant: ROUSSELET CENTRIFUGATION SA, Annonay, France

Co-applicant: THE UNIVERSITY OF MEDICINE & PHARMACY, Ho Chi Minh, Vietnam

Co-applicant: TSHWANE UNIVERSITY OF TECHNOLOGY, Pretoria, South Africa

Co-applicant: FACULTE DES SCIENCES, Sfax, Tunisie

Co-applicant: UNIVERSIDAD CATOLICA DEL NORTE, Antofagasta, Chili

Total funding for UNIGE: EUROS 153'000.—(ca: CHF 165'626.--)

Allocation 2016: CHF 69'350.--

Duration: 3 years

Starting date: 2016

## SOCIETE ACADEMIQUE

"2016/32 RMN 600"

Main applicant: J.-L. WOLFENDER

Total funding: CHF 25'000.--

Allocation 2016: CHF 25'000.--

Duration: 1 year

Starting date: 2016

## FONDATION BONINCHI

"BONINCHI RMN"

Main applicant: J.-L. WOLFENDER

Total funding: CHF 80'000.--

Allocation 2016: CHF 80'000.--

Duration: 1 year

Starting date: 2016



## FONDATION SCHMIDHEINY

“SCHMIDHEINY RMN”

Main applicant: J.-L. WOLFENDER

Total funding: CHF 40'000.--

Allocation 2016: CHF 40'000.--

Duration: 7 months

Starting date: 2016

## FONDATION WILSDORF

“WILSDORF RMN 600”

Main applicant: J.-L. WOLFENDER

Total funding: CHF 150'000.—

Allocation 2016: CHF 150'000.—

Duration: 7 months

Starting date: 2016

## INDUSTRY AND ASSIMILATED

Code	Service - Development - Research	Total Amount for 2016 (CHF)
S17072	Fonds Industrie (J.L. Wolfender) – Research & Services	39'715
S18306	Industry Partner from the Arc Lemanic (NIHS)	47'137
S18998	Industry Partner from the Arc Lemanic (NESTEC)	11'607
	<b>Total</b>	<b>98'459</b>

## DEVICES IN LEND

Device	Enterprise /Laboratory	Lending period	Localisation	Insurance Contrat
Puriflash 4100 MS	Interchim	2014	3-333	150'000

## PUBLICATIONS

### THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

Trends in Plant Science	11.91
Natural Product Reports	11.04
Food Chemistry	4.52
Phytochemistry Reviews	3.93
Metabolomics	3.69
Journal of Natural Products	3.28
Phytochemistry	3.20
Molecules	2.86
Molecular BioSystems	2.78
Phytochemical Analysis	2.29

### SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)

1. P. M. ALLARD, T. PERESSE, J. BISSON, K. GINDRO, L. MARCOURT, V. C. PHAM, F. ROUSSI, M. LITAUDON, J. L. WOLFENDER: "Integration of Molecular Networking and In-Silico MS/MS Fragmentation for Natural Products Dereplication", Anal. Chem., 88, 3317-3323 (2016). 6.32

2. A. AZZOLINI, Q. FAVRE-GODAL, J. ZHAN, L. MARCOURT, N. S. EBRAHIMI, S. WANG, P. FAN, H. X. LOU, D. GUILLARME, E. F. QUEIROZ, J. L. WOLFENDER: "Preparative scale MS-guided isolation of bioactive compounds using high resolution flash chromatography: antifungals from *Chiloscyphus polyanthos* as a case study", *Planta Med.*, 82, 1051-1057 (2016). 2.34
3. S. BERTRAND, A. AZZOLLINI, A. NIEVERGELT, J. BOCCARD, S. RUDAZ, M. CUENDET, J. L. WOLFENDER: "Statistical Correlations between HPLC Activity-Based Profiling Results and NMR/MS Microfraction Data to Deconvolute Bioactive Compounds in Mixtures", *Molecules*, 21, 259 (2016). 2.86
4. N. BOHNI, V. HOFSTETTER, K. GINDRO, B. BUYCK, O. SCHUMPP, S. BERTRAND, J. MONOD, J. L. WOLFENDER: "Production of Fusaric Acid by *Fusarium* spp. in Pure Culture and in Solid Medium Co-Cultures", *Molecules*, 21, 370; doi: 310.3390/molecules21030370 (2016). 2.86
5. B. BOUCHERLE, R. HAUDECOEUR, E. F. QUEIROZ, M. DE WAARD, J. L. WOLFENDER, R. J. ROBINS, A. BOUMENDJEL: "*Nauclea latifolia*: biological activity and alkaloid phytochemistry of a West African tree", *Nat. Prod. Rep.*, 33, 1034-1043 (2016). 11.04
6. R. S. CABRAL, P. M. ALLARD, L. MARCOURT, M. C. YOUNG, E. F. QUEIROZ, J. L. WOLFENDER: "Targeted Isolation of Indolopyridoquinazoline Alkaloids from *Conchocarpus fontanesianus* Based on Molecular Networks", *J. Nat. Prod.*, 79, 2270-2278 (2016). 3.28
7. A. CHAUVIN, A. LENGLET, J. L. WOLFENDER, E. E. FARMER: "Paired Hierarchical Organization of 13-Lipoxygenases in *Arabidopsis*", *Plants (Basel)*, 5, 16 (2016). 2.23
8. P. COULERIE, Y. RATINAUD, S. MOCO, L. MERMINOD, M. NARANJO PINTA, J. BOCCARD, L. BULTOT, M. DEAK, K. SAKAMOTO, E. F. QUEIROZ, J. L. WOLFENDER, D. BARRON: "Standardized LCxLC-ELSD Fractionation Procedure for the Identification of Minor Bioactives via the Enzymatic Screening of Natural Extracts", *J. Nat. Prod.*, 79, 2856-2864 (2016). 3.28
9. S. CRETTON, S. DORSAZ, A. AZZOLINI, Q. FAVRE-GODAL, L. MARCOURT, S. N. EBRAHIMI, F. VOINESCO, E. MICHELLOD, D. SANGLARD, K. GINDRO, J. L. WOLFENDER, M. CUENDET, P. CHRISTEN: "Antifungal Quinoline Alkaloids from *Waltheria indica*", *J. Nat. Prod.*, 79, 300-307 (2016). 3.28
10. D. A. DIAS, O. A. JONES, D. J. BEALE, B. A. BOUGHTON, D. BENHEIM, K. A. KOUREMENOS, J. L. WOLFENDER, D. S. WISHART: "Current and Future Perspectives on the Structural Identification of Small Molecules in Biological Systems", *Metabolites*, 6, 46 (2016). 3.18
11. J. M. DOS SANTOS, D. SILVA, T. S. MACEDO, H. M. P. TEIXEIRA, D. R. M. MOREIRA, S. CHALLAL, J. L. WOLFENDER, E. F. QUEIROZ, M. B. P. SOARES: "Conjugation of *N*-acylhydrazone and 1,2,4-oxadiazole leads to the identification of active antimalarial agents", *Bioorg. Med. Chem.*, 24, 5693-5701 (2016). 2.45
12. Q. FAVRE-GODAL, S. DORSAZ, L. MARCOURT, V. BERTINI, E. DORMIA, E. MICHELLOD, F. VOINECO, M. GUPTA, K. GINDRO, D. SANGLARD, E. F. QUEIROZ, J. L. WOLFENDER: "Identification of saponins from *Schefflera systyla*, *Odontadenia puncticulosa* and *Conostegia speciosa* and in depth investigation of their in vitro and in vivo antifungal activities", *J. Braz. Chem. Soc.*, 00, 1-12 (2016). 1.19
13. M. HAMBURGER, O. POTTERAT, J. L. WOLFENDER, E. F. QUEIROZ: "Special issue dedicated to Prof. Dr. Dres. h. c. mult. Kurt Hostettmann", *Planta Med.*, 82, 919 (2016). 2.34
14. P. JARVINEN, S. NYBOND, L. MARCOURT, E. FERREIRA QUEIROZ, J. L. WOLFENDER, A. METTALA, M. KARP, H. VUORELA, P. VUORELA, A. HATAKKA, P. TAMMELA: "Cell-based bioreporter assay coupled to HPLC micro-fractionation in the evaluation of antimicrobial properties of the basidiomycete fungus *Pycnoporus cinnabarinus*", *Pharm. Biol.*, 54, 1108-1115 (2016). 1.19

15. A. LANDREAU, S. BERTRAND, C. SIMOES-PIRES, L. MARCOURT, D. B. TAI, M. LITAUDON, D. GUILLET, P. RICHOMME, P. A. CARRUPT, J. L. WOLFENDER: "Normal phase HPLC-based activity profiling of non-polar crude plant extracts -acetylcholinesterase inhibiting guttiferones from Montrouziera cauliflora as a case study", *Nat. Prod. Res.*, 30, 2754-2759 (2016). 1.82
16. D. MAAG, A. KOHLER, C. A. ROBERT, M. FREY, J. L. WOLFENDER, T. C. TURLINGS, G. GLAUSER, M. ERB: "Highly localized and persistent induction of Bx1-dependent herbivore resistance factors in maize", *Plant J.*, 88, 976-991 (2016). 5.90
17. V. OLDRATI, M. ARRELL, A. VIOLETTE, F. PERRET, X. SPRUNGLI, J. L. WOLFENDER, R. STOCKLIN: "Advances in venomics", *Mol. Biosyst.*, 12, 3530-3543 (2016). 2.78
18. C. PETIT, A. BUJARD, K. SKALICKA-WOZNIAK, S. CRETTON, J. HOURIET, P. CHRISTEN, P. A. CARRUPT, J. L. WOLFENDER: "Prediction of the Passive Intestinal Absorption of Medicinal Plant Extract Constituents with the Parallel Artificial Membrane Permeability Assay (PAMPA)", *Planta Med.*, 82, 424-431 (2016). 2.34
19. M. WANG, J. J. CARVER, V. V. PHELAN, L. M. SANCHEZ, N. GARG, Y. PENG, D. D. NGUYEN, J. WATROUS, C. A. KAPONO, T. LUZZATTO-KNAAN, C. PORTO, A. BOUSLIMANI, A. V. MELNIK, M. J. MEEHAN, W.-T. LIU, M. CRUSEMANN, P. D. BOUDREAU, E. ESQUENAZI, M. SANDOVAL-CALDERON, R. D. KERSTEN, L. A. PACE, R. A. QUINN, K. R. DUNCAN, C.-C. HSU, D. J. FLOROS, R. G. GAVILAN, K. KLEIGREWE, T. NORTHEN, R. J. DUTTON, D. PARROT, E. E. CARLSON, B. AIGLE, C. F. MICHELSEN, L. JELSBK, C. SOHLENKAMP, P. PEVZNER, A. EDLUND, J. MCLEAN, J. PIEL, B. T. MURPHY, L. GERWICK, C.-C. LIAW, Y.-L. YANG, H.-U. HUMPF, M. MAANSSON, R. A. KEYZERS, A. C. SIMS, A. R. JOHNSON, A. M. SIDEBOTTOM, B. E. SEDIO, A. KLITGAARD, C. B. LARSON, C. A. BOYA P, D. TORRES-MENDOZA, D. J. GONZALEZ, D. B. SILVA, L. M. MARQUES, D. P. DEMARQUE, E. POCIUTE, E. C. O'NEILL, E. BRIAND, E. J. N. HELFRICH, E. A. GRANATOSKY, E. GLUKHOV, F. RYFFEL, H. HOUSON, H. MOHIMANI, J. J. KHARBUSH, Y. ZENG, J. A. VORHOLT, K. L. KURITA, P. CHARUSANTI, K. L. MCPHAIL, K. F. NIELSEN, L. VUONG, M. ELFEKI, M. F. TRAXLER, N. ENGENE, N. KOYAMA, O. B. VINING, R. BARIC, R. R. SILVA, S. J. MASCUCH, S. TOMASI, S. JENKINS, V. MACHERLA, T. HOFFMAN, V. AGARWAL, P. G. WILLIAMS, J. DAI, R. NEUPANE, J. GURR, A. M. C. RODRIGUEZ, A. LAMSA, C. ZHANG, K. DORRESTEIN, B. M. DUGGAN, J. ALMALITI, P.-M. ALLARD, P. PHAPALE, L.-F. NOTHIAS, T. ALEXANDROV, M. LITAUDON, J.-L. WOLFENDER, J. E. KYLE, T. O. METZ, T. PERYEA, D.-T. NGUYEN, D. VANLEER, P. SHINN, A. JADHAV, R. MULLER, K. M. WATERS, W. SHI, X. LIU, L. ZHANG, R. KNIGHT, P. R. JENSEN, B. O. PALSSON, K. POGLIANO, R. G. LININGTON, M. GUTIERREZ, N. P. LOPES, W. H. GERWICK, B. S. MOORE, P. C. DORRESTEIN, N. BANDEIRA. "Sharing and community curation of mass spectrometry data with Global Natural Products Social Molecular Networking", *Nat. Biotech.*, 34, 828-837 (2016). 41.66
20. C. Q. ROCHA, F. M. DE-FARIA, L. MARCOURT, S. N. EBRAHIMI, B. T. KITANO, A. F. GHILARDI, A. L. FERREIRA, A. C. A. ALMEIDA, R. J. DUNDER, A. R. M. SOUZA-BRITO, M. HAMBURGER, W. VILEGAS, E. F. QUEIROZ, J. L. WOLFENDER. "Gastroprotective effects of hydroethanolic root extract of Arrabidaea brachypoda: Evidences of cytoprotection and isolation of unusual glycosylated polyphenols". *Phytochemistry*, 135, 93-105 (2016). 3.20
21. M. L. ZERAIK, E. F. QUEIROZ, L. MARCOURT, O. CICLET, I. CASTRO-GAMBOA, D. H. SIQUEIRA SILVA, M. CUENDET, V. D. S. BOLZANI, J. L. WOLFENDER: "Antioxidants, quinone reductase inducers and acetylcholinesterase inhibitors from *Spondias tuberosa* fruits", *J. Funct. Foods*, 21, 396-405 (2016). 3.14
22. V. ZWICK, P.-M. ALLARD, L. ORY, C. A. SIMOES-PIRES, L. MARCOURT, K. GINDRO, J. L. WOLFENDER, M. CUENDET "UHPLC-MS-based HDAC Assay Applied to Bio-guided Microfractionation of Fungal Extracts" *Phytochem. Anal.* (2016). 2.29

## SCIENTIFIC PUBLICATIONS (WITHOUT IMPACT FACTOR)

1. J. HOURIET, E. BUHLMANN, C. RUDIGIER, E. KIEHLMANN, S. G. SCHROEDER, C. WOLFRUM, J. L. WOLFENDER. "Étude des effets anti-obésité de l'extrait de *Pueraria montana*", *PharmJournal* 5-6, 25 (2016).

## PRESENTATIONS

### POSTERS PRESENTATIONS

1. T. BRILLATZ, E. F. QUEIROZ, L. MARCOURT, M. JACMIN, A. D. CRAWFORD, J. L. WOLFENDER. "Search for effective antiepileptic natural products by in-vivo bioguided isolation based on the zebrafish anticonvulsant PTZ model". 9th Annual Swiss Zebrafish Meeting, Bern, Switzerland, 27th January 2016
2. K. ALIPIEVA, G. ZAHMANOV, S. SIMOVA, S. ZHOU, J. L. WOLFENDER, M. I. GEORGIEV. "New Tetraacetylated Iridoid Glycosides from *Sambucus ebulus* L. Leaves". 9th Conference on Medicinal and Aromatic Plants of Southeast European Countries, Plovdiv, Bulgaria, May 26-29, 2016
3. P.-M. ALLARD, T. PERESSE, J. BISSON, K. GINDRO, L. MARCOURT, V. C. PHAM, F. ROUSSI, M. LITAUDON, J.-L. WOLFENDER. "Integration of molecular networking and in-silico MS/MS fragmentation: complementary tools for natural products dereplication". 10<sup>èmes</sup> Journées du Réseau Francophone de Métabolomique et Fluxomique (RFMF), Montpellier, France, May 31-June 2, 2016
4. J. HOURIET, E.F. QUEIROZ, P.M. ALLARD, L. VALLIN, S. LI, R. WANG, L. MARCOURT, K. KUCHTA, J. L. WOLFENDER. "In depth metabolome investigation of a multi-herb formula used in Traditional Chinese Medicine". 10<sup>èmes</sup> Journées Scientifiques du Réseau Francophone de Métabolomique et Fluxomique (RFMF), Montpellier, France, May 31-June 2, 2016
5. A. AFZAN, E. F. QUEIROZ, N. KASIM, N. H. ISMAIL, A. M. ALI, N. MAT, J. L. WOLFENDER. "Metabolomic differentiation of varieties from *Ficus deltoidea*, a plant used for management of diabetes in Malaysia". 9th Joint Natural Products Conference 2016, Copenhagen, Denmark, July 24-27, 2016
6. P. M. ALLARD, F. OLIVON, D. RIGHI, P. LEYSSEN, F. ROUSSI, M. LITAUDON, J. L. WOLFENDER. "Massive multi-informative molecular networks to mine New-Caledonian chemodiversity for antiviral compounds". 9th Joint Natural Products Conference 2016, Copenhagen, Denmark, 24-27 July, 2016
7. P. M. ALLARD, T. PÉRESSE, J. BISSON, K. GINDRO, L. MARCOURT, V. C. PHAM, F. ROUSSI, M. LITAUDON, J. L. WOLFENDER. "Integration of molecular networking & in-silico MS/MS fragmentation: a novel dereplication strategy in natural products chemistry". 9th Joint Natural Products Conference 2016, Copenhagen, Denmark 24-27 July, 2016
8. N. C. AQUINO, E. F. QUEIROZ, L. MARCOURT, F. AZUL, J. A. C. SOUSA, H. H. S. AMARAL, L. LEAL, J. L. WOLFENDER, E. R. SILVEIRA. "Phytochemical analysis of the decoction from leaves of cultivated specimens of *Myracrodruon urundeuva* ("aroeira-do-sertão")". 9th Joint Natural Products Conference 2016, Copenhagen, Denmark, 24-27 July, 2016
9. A. AZZOLLINI, L. BOGGIA, J. BOCCARD, B. SGORBINI, N. LECOUTRE, P. RUBIOLO, S. RUDAZ, K. GINDRO, C. BICCHI, J. L. WOLFENDER. "Detection and dynamics of volatile/non-volatile metabolite induction in fungal co-culture through a miniaturised MS-based metabolomic approach". 9th Joint Natural Products Conference 2016, Copenhagen, Denmark, July 24-27, 2016
10. A. AZZOLLINI, J. L. WOLFENDER, K. GINDRO. "De novo metabolite production through co-cultivation of different fungal species on solid media". 9th Joint Natural Products Conference 2016, Copenhagen, Denmark, 24-27 July, 2016
11. T. BRILLATZ, E. F. QUEIROZ, L. MARCOURT, M. JACMIN, A. D. CRAWFORD, J. L. WOLFENDER. "Anticonvulsant agents from *Boswellia sacra* identified by zebrafish bioassay-guided fractionation". 9th Joint Natural Products Conference 2016, Copenhagen, Denmark, July 24-27, 2016
12. T. BRILLATZ, E. F. QUEIROZ, L. MARCOURT, K. VOUGOGIANNOPOULOU, M. JACMIN, A. D. CRAWFORD, L. SKALTSOUNIS, J. L. WOLFENDER. "Bioguided isolation of anticonvulsant principles from *Helleborus cyclophyllus* using the zebrafish epilepsy model". 9th Joint Natural Products Conference 2016, Copenhagen, Denmark, 24-27 July, 2016
13. P. E. CAMPOS, E. F. QUEIROZ, L. MARCOURT, J. L. WOLFENDER, A. S. SANCHEZ, B. ILLIEN, A. AL MOURABIT, A. GAUVIN-BIALECKI. "Isolation and identification of new secondary metabolites from the marine sponge *Monanchora unguiculata*". 9th Joint Natural Products Conference 2016, Copenhagen, Denmark, 24-27 July, 2016

14. P. COULERIE, Y. RATINAUD, S. MOCO, L. MERMINOD, M. CABO, J. BOCCARD, E. F. QUEIROZ, L. BULTOT, J. L. WOLFENDER, K. SAKAMOTO, D. BARRON. "Improving the detection of plant bioactive compounds by coupling a semi-preparative 2D-LCxLC system to an HTS platform". 9<sup>th</sup> Joint Natural Products Conference 2016, Copenhagen, Denmark, July 24-27, 2016
15. S. CRETTON, P. M. ALLARD, I. GARCIA-GOMEZ, K. ANHEUSER, B. WASTIAU, J. L. WOLFENDER, M. CUENDET, P. CHRISTEN. "Modern tools to analyse museum samples of curare and psychoactive preparations used by Amazonian tribes". 9<sup>th</sup> Joint Natural Products Conference 2016, Copenhagen, Denmark, 24-27 July, 2016
16. P. DE OLIVEIRA FIGUEIREDO, E. F. QUEIROZ, L. MARCOURT, W. H. KATO JR, F. RODRIGUES GARCEZ, W. S. GARCEZ, J. L. WOLFENDER. "Comprehensive investigation of the secondary metabolites from the roots of *Galianthe thalictroides* (Rubiaceae)". 9<sup>th</sup> Joint Natural Products Conference 2016, Copenhagen, Denmark, July 24-27, 2016
17. E. H. A. DIOP, E. F. QUEIROZ, L. MARCOURT, S. KICKA, S. RUDAZ, T. DIOP, J. L. WOLFENDER. "Identification of antimycobacterial ellagitannins from the aqueous extract of *Combretum aculeatum*". 9<sup>th</sup> Joint Natural Products Conference 2016, Copenhagen, Denmark, 24-27 July, 2016
18. A. GRAND-GUILLAUME PERRENOUD, P. COULERIE, S. MOCO, Y. RATINAUD, L. BULTOT, D. GUILLARME, E. F. QUEIROZ, K. SAKAMOTO, J. L. VEUTHEY, J. L. WOLFENDER, D. BARRON. "Advanced technologies for exploring the chemical and functional properties of bioactive constituents in food". 9<sup>th</sup> Joint Natural Products Conference 2016, Copenhagen, Denmark, July 24-27, 2016
19. J. HOURIET, E. BUHLMANN, C. RUDIGIER, E. KIEHLMANN, J. RADTKE, J. HEEREN, T. FRIEDEMANN, S. SCHRÖDER, C. WOLFRUM, J. L. WOLFENDER. "Investigation of the anti-obesity effect of *Pueraria montana* var. *lobata*". 9<sup>th</sup> Joint Natural Products Conference 2016, Copenhagen, Denmark, 24-27 July, 2016
20. M. M. MNATSAKANYAN, E. F. QUEIROZ, L. MARCOURT, B. PRAJOGO, J. L. WOLFENDER. "Chemical profile of *Justicia gendarussa* a medicinal plant used for male contraception". 9<sup>th</sup> Joint Natural Products Conference 2016, Copenhagen, Denmark, July 24-27, 2016
21. T. PÉRESSE, P. M. ALLARD, J. L. WOLFENDER, V. C. PHAM, D. T. M. HUONG, F. ROUSSI, M. LITAUDON. "Molecular networking approach to detect new analogues of prenylated stilbenes from *Macaranga* spp". 9<sup>th</sup> Joint Natural Products Conference 2016, Copenhagen, Denmark, 24-27 July, 2016
22. G. M. RANDAZZO, Q. FAVRE-GODAL, S. DORSAZ, E. F. QUEIROZ, L. MARCOURT, D. SANGLARD, J.-L. WOLFENDER, J. BOCCARD, S. RUDAZ. "A new method to navigate large molecular datasets using the chemical space of natural products: application to antifungal activity". Chimie 2016, Namur, Belgique, 17-20 January, 2016
23. D. RIGHI, A. AZZOLLINI, E. F. QUEIROZ, J. L. WOLFENDER. "Flash chromatography MS-targeted isolation of natural products under normal phase conditions". 9<sup>th</sup> Joint Natural Products Conference 2016, Copenhagen, Denmark, 24-27 July, 2016
24. D. RIGHI, A. MAINETTI, Q. F. GODAL, L. MARCOURT, J. L. WOLFENDER, E. F. QUEIROZ. "Boosting the antifungal drug discovery by halogenating plant extracts to obtain bioactive 'unnatural' natural products". 9<sup>th</sup> Joint Natural Products Conference 2016, Copenhagen, Denmark, July 24-27, 2016
25. J. L. WOLFENDER, P. M. ALLARD. "Integration of molecular networking and in-silico MS/MS fragmentation for sensitive high throughput natural products dereplication". 9<sup>th</sup> Joint Natural Products Conference 2016, Copenhagen, Denmark, 24-27 July, 2016
26. J.-L. WOLFENDER, P.-M. ALLARD, D. RIGHI, A. AZZOLLINI, L. MARCOURT, E. F. QUEIROZ. "Towards an efficient and targeted isolation of valuable natural products only". 9<sup>th</sup> Joint Natural Products Conference 2016, Copenhagen, Denmark, 24-27 July, 2016
27. S. ZHOU, C. P. TANG, C. Q. KE, J. L. WOLFENDER, Y. YE. "Differentiation of plants used in TCM as antitussive agent by UHPLC-HRMS based metabolomics: the case of *Stemona* species". 9<sup>th</sup> Joint Natural Products Conference 2016, Copenhagen, Denmark, July 24-27, 2016
28. S. ZHOU, Y. YE, A. AFZAN, P. M. ALLARD, C. WOLFRUM, J. L. WOLFENDER. "Investigation of an edible TCM bitter melon (*Momordica charantia*): metabolite profiling, differentiation and characterization". 9<sup>th</sup> Joint Natural Products Conference 2016, Copenhagen, Denmark, 24-27 July, 2016

29. V. ZWICK, C. A. SIMÕES-PIRES, L. ORY, P. M. ALLARD, J. L. WOLFENDER, M. CUENDET. "A UHPLC/MS-MS-based HDAC assay applied to bio-guided microfractionation of fungi extracts". 9<sup>th</sup> Joint Natural Products Conference 2016, Copenhagen, Denmark, July 24-27, 2016
30. D. RIGHI, A. AZZOLLINI, E.F. QUEIROZ, J-L. WOLFENDER. Flash chromatography MS-targeted isolation of natural products under Normal Phase conditions, Swiss Pharma Science day 2016, Bern, Switzerland, August 31, 2016
31. D. RIGHI, A. AZZOLLINI, E.F. QUEIROZ, J-L. WOLFENDER. Flash chromatography MS-targeted isolation of natural products under Normal Phase conditions, SILAE 2016, Modena, Italy, Sept 11-15, 2016
32. T. BRILLATZ, E. F. QUEIROZ, L. MARCOURT, M. JACMIN, A. D. CRAWFORD, J. L. WOLFENDER. "Anticonvulsant agents from *Boswellia sacra* evidenced in PTZ zebrafish bioguided-assay". Zermatt meeting, Zermatt, Switzerland, September 5-9, 2016

## CONGRESSES & SYMPOSIA

1. P. M. ALLARD, T. PÉRESSE, J. BISSON, K. GINDRO, L. MARCOURT, V. C. PHAM, F. ROUSSI, M. LITAUDON, J. L. WOLFENDER. "Integration of complementary tools for natural products dereplication: molecular networking and in-silico MS/MS fragmentation". I-NPChem Inaugural Symposium, 6-7<sup>th</sup> June 2016, Paris (France).
2. P. M. ALLARD, T. PÉRESSE, J. BISSON, K. GINDRO, L. MARCOURT, V. C. PHAM, F. ROUSSI, M. LITAUDON, J. L. WOLFENDER. "Integration of molecular networking & in-silico MS/MS fragmentation: a novel dereplication strategy in natural products chemistry." 9<sup>th</sup> Joint Natural Products Conference – JNPC, 24-27 July 2016, Copenhagen (Denmark).
3. P. M. ALLARD, J. L. WOLFENDER. "Etude des matrices végétales par Métabolomique, en particulier par Molecular Networking". Seminar Pierre Fabre Laboratories, December 15, 2016, Toulouse Langlade Oncopole (France).
4. P. COULERIE, Y. RATINAUD, S. MOCO, L. MERMINOD, M. CABO, J. BOCCARD, E. F. QUEIROZ, L. BULTOT, J. L. WOLFENDER, K. SAKAMOTO, D. BARRON. "Fully Automated Workflow for Efficient Detection and Rapid Identification of New Hits from Plant Extracts". Bioactive Natural Products symposium - translating promise into practice, RSC Biotechnology Group conference, 11-13 July 2016, University of Oxford (England).
5. J. HOURIET, E. FERREIRA QUEIROZ, P. M. ALLARD, L. VALLIN, S. LI, R. WANG, L. MARCOURT, K. KUCHTA, J. L. WOLFENDER. "Metabolite profiling and targeted isolation of markers for a comprehensive standardisation of a multi-herb TCM formula to treat atopic dermatitis". 9<sup>th</sup> Joint Natural Products Conference 2016, 24-27 July 2016, Copenhagen (Denmark).
6. F. OLIVON, P. M. ALLARD, A. KOVAL, P. LEYSSEN, V. DUMONTET, F. ROUSSI, X. CACHET, D. TOUBOUL, J. L. WOLFENDER, V. KATANAIEV, M. LITAUDON. "Can molecular networking be a powerful tool to target specific bioactive scaffolds? Case study of New Caledonian Euphorbiaceae species". 9<sup>th</sup> Joint Natural Products Conference 2016, 24-27 July 2016, Copenhagen (Denmark).
7. E. F. QUEIROZ, J. L. WOLFENDER. "Innovative strategies for the efficient isolation of natural products at the preparative scale and discovery of potential new leads". X Konferencji, Analityczne zastosowania chromatografii cieczowej, 20-21 October 2016, Warsaw (Poland).
8. E. F. QUEIROZ, J. L. WOLFENDER. "Innovative strategies for the efficient isolation of natural products at the preparative scale and discovery of potential new leads". 6<sup>th</sup> International Congress on Medicinal and Aromatic Plants, 31 May - 1 June 2016, Coimbra (Portugal).
9. E. F. QUEIROZ, J. L. WOLFENDER. "Innovative strategies for the efficient isolation of natural products at the preparative scale and discovery of potential new leads". Analytica, 11 May 2016, Munich (Germany).
10. E. F. QUEIROZ, J. L. WOLFENDER. "Innovative strategies for the isolation of bioactive natural products from the Brazilian biodiversity". III workshop da pós-graduação em química da UFC programação, 4 April 2016, University of Fortaleza, Fortaleza (Brazil).



11. E. F. QUEIROZ, J. L. WOLFENDER. "Innovative strategies for the isolation of bioactive natural products from the Brazilian biodiversity. Healthy eating: current food practices and concerns through a comparative Swiss-Brazilian lens". University of St Gallen, 22 April 2016, St Gallen (Switzerland).
12. J. L. WOLFENDER. "Est-il toujours nécessaire d'isoler les produits naturels pour les identifier?". Journées nationales de l'AFSEP, Orléans, June 17, 2016, (France).
13. J. L. WOLFENDER. "Innovative metabolomics strategies for the identification of biomarkers in plant and microbial metabolomes". ANZMET 2016, 1 April 2016, Melbourne (Australia).
14. J. L. WOLFENDER. "Metabolomics and traditional Chinese medicine ". Swiss Society of Pharmacology and Toxicology, 28 January 2016, Bern (Switzerland).
15. J. L. WOLFENDER. "The quest for biomarkers in plant and microbial metabolomes". 1<sup>st</sup> Biomarker Day, 9 March 2016, Geneva (Switzerland).
16. J. L. WOLFENDER. "Towards an efficient and targeted isolation of valuable natural products only ". Simposium Nasional Kimia Bahan Alam XXIV (SimNaskBA-2016), 18-19 October 2016, Yogyakarta (Indonesia).
17. J. L. WOLFENDER. "Des stratégies analytiques innovantes pour l'identification rapide de produits naturels bioactifs et de biomarqueurs en métabolomique". Journée des Doctorants de l'Institut des Sciences Analytiques, 6-9 December 2016, Villeurbanne (France).
18. J. L. WOLFENDER. "Metabolomics and innovative biological assays, new perspectives in natural products chemistry". 2016 Philippine Chemistry Congress (Kapisanang Kimika ng Pilipinas), 13-15 April 2016, Iloilo City (Philippines).
19. J. L. WOLFENDER. "Metabolomics and innovative biological assays, new perspectives in natural products chemistry". 2<sup>nd</sup> Edition du Congrès International - Substances Naturelles et Développement Durable, 19-21 May 2016, Rabat (Morocco).
20. J. L. WOLFENDER. "Efficient analytical strategies for an early identification of bioactive natural products at the herbarium sample scale". XXV International Meeting of the Italo-Latin American Society of Ethnomedicine SILAE2016, 11-15 September 2016, Modena (Italy).
21. J. L. WOLFENDER. "Efficient ways to investigate plant and micro-organism metabolomes for the search of new lead compounds of natural origin". Bioactive Natural Products symposium - translating promise into practice, RSC Biotechnology Group conference , 11-13 July 2016, University of Oxford (England).
22. J. L. WOLFENDER. "Cherry picking of valuable natural products only based on deep metabolome investigation of herbal drugs". Shanghai International Conference on Traditional Chinese Medicine and Natural Medicine, 19-21 October 2016, Shanghai (China).
23. J. L. WOLFENDER. "How deep can we dig into plant and microbial metabolomes to identify biologically relevant biomarkers?". Seminar University of Georgia, 3 February 2016, Atlanta (USA).
24. J. L. WOLFENDER. "Natural Product Research and Metabolomics: Two Side of the Same Coin". Seminar University Airlangga, 17 March 2016, Surabaya (Indonesia).
25. J. L. WOLFENDER. "Research activities at the Phytochemistry and Bioactive Natural Products unit of the School of Pharmaceutical Science - Metabolite profiling and rational rapid targeted isolation". Seminar Pierre Fabre Laboratories, 27 September 2016, Toulouse (France).
26. J. L. WOLFENDER. "New ways to decipher plant and microbial metabolomes to identify bioactive natural products". Seminar University of Sydney, 2 April 2016, Sydney (Australia).
27. J. L. WOLFENDER, P. M. ALLARD. "Integration of molecular networking and in-silico MS/MS fragmentation for sensitive high throughput natural products dereplication ". 9<sup>th</sup> Joint Natural Products Conference 2016, Pre Conference Symposium: Advances in (bio) analytical techniques applied to natural products research, 24 July 2016, Copenhagen (Denmark).
28. J. L. WOLFENDER, P. M. ALLARD. "How far deep can we get into plant and microbial metabolomes with modern mass spectrometry approaches?". 10<sup>th</sup> International Symposium on Chromatography of Natural Products, 6-9 June 2016, Lublin (Poland).



29. J. L. WOLFENDER, P. M. ALLARD, D. RIGHI, A. AZZOLLINI, L. MARCOURT, E. F. QUEIROZ. "Towards an efficient and targeted isolation of valuable natural products only". International Symposium on Natural Products for the Future (ISNPF2016), 1-4 September 2016, Tokushima (Japan).
30. J. L. WOLFENDER, G. GLAUSER. "Apport de la métabolomique pour la découverte de composés bioactifs dans les matrices végétales". 20<sup>ème</sup> Journées Scientifiques de la CCCTA, 9 March 2016, Les Diablerets (Switzerland).

## CONTINUING EDUCATION, WORKSHOPS & OPEN TO THE PUBLIC LECTURES

1. P. M. ALLARD. "Identification des métabolites par spectrométrie de masse : retours sur CASMI 2016". 10<sup>èmes</sup> Journées Scientifiques du Réseau Francophone de Métabolomique et Fluxomique (RFMF), Montpellier, France, May 31, 2016
2. E. F. QUEIROZ, J.-L. WOLFENDER. "Preparative methods for bioactive natural product isolation: generalities on natural product matrices and sample preparation". III workshop da pós-graduação em química da UFC programação. University of Fortaleza, Fortaleza, Brazil, April 4-8, 2016
3. J. L. WOLFENDER. "Phytochimie des plantes à intérêt pharmaceutique et cosmétique". Workshop Chanel, Paris, France, January 7, 2016
4. J. L. WOLFENDER. "Confirmatory analysis and de novo structural identification". Workshop Plants and Metabolomics 2016, University of Leiden, , Leiden, Netherland, April 21, 2016

## THESIS PRESENTED

### INTRA-MUROS THESIS

Quentin FAVRE-GODAL

"Development of innovative strategies for the discovery of new antifungals from natural sources and in depth investigation of their bioactivity profiles"

Thesis no 4898 – Université de Genève

Director: J.-L. WOLFENDER

Co-director : E.F. QUEIROZ

Daniel MAAG

"1,4-Benzoxazin-3-ones at the metabolic interface between plants and insects"

Thesis no 4925 – Université de Genève

Director: J.-L. WOLFENDER

Co-director: T. Turlings

Charlotte PETIT

"Towards a prediction of intestinal absorption of medicinal plant constituents with the PAMPA permeability assay"

Thesis no 5029 – Université de Genève

Director: J.-L. WOLFENDER

Co-director: P.-A. CARRUPT

Vera OLDRATI

"Venomics to decrypt the biomedical potential of spider toxins"

Thesis no 5041 – Université de Genève

Director: J.-L. WOLFENDER

Co-director: R. Stoecklin

## EXTRA-MUROS THESIS JURY

Lorenzo BOGGIA

“Development of new strategies to study the composition of high complexity samples from biologically active plant species: definition of metabolite profiling in toto of biologically active fractions through advanced extraction methods and chromatographic techniques combined with mass spectrometry”

Università degli Studi di Torino

Director: P. RUBIOLLO

Nalisha Binti ITHNIN

“Metabolomics-based profiling of oil-palm-Ganoderma interaction utilizing LC-MS and NMR”

University Putra Malaysia

Director: I.S. ISMAIL

Dapeng LI

“Tissue and population-level diversity in plant secondary metabolism: a systematic exploration using MS/MS structural analysis”

Max Planck Institute for Chemical Ecology

Director: I. BALDWIN

Co-director: G. POHNERT

Anne-Laure PEYRAT

“Recherche de composés actifs contre le virus de la dengue à partir de Diospyros sp. et de leurs endophytes associés”

Muséum National d’Histoire Naturelle

Director : D. STIEN

Co-director: M. LITAUDON

Florence AUBERON

“Stilbénoides et dérivés glucosyloxybenzyliques d'acides organiques isolés d'orchidées tropicales : Etudes chimiques et biologiques de *Cyrtopodium paniculatum* (Ruiz & Pav.) Gara y et *Arundina graminifolia* (D. Don) Hochr.”

University of Strasbourg

Director: A. LOBSTEIN

# PHARMACEUTICAL TECHNOLOGIES



## PROFESSOR ERIC ALLEMANN

## PROFESSOR NORBERT LANGE

### GENERAL DESCRIPTION OF THE UNIT

Research at the unit of Pharmaceutical Technology is focused on the delivery of therapeutic agents and contrast agents for medical imaging at the right site on the right time. Eric Allémann has activities in nanomedicine, micro particles, targeted-contrast agents for medical imaging. Norbert Lange leads research in photodetection, photodynamic therapy and enzymatically activated prodrug. Florence Delie leads research in nanomedicine and vectorization. In 2016, various collaborations were continued with the University Hospital of Geneva and the EPFL. Collaboration projects with established companies were continued and new ones initiated. Florence Delie leads research in nanomedicine and vectorization.

### SPECIFIC RESEARCH FIELDS

- ✚ Development of drug formulations for intra-articular delivery
- ✚ Enzymatically-activated prodrugs and supramolecular constructs
- ✚ Development of new contrast agents for MRI
- ✚ Formulation of microbiota
- ✚ Polymeric photosensitizers projects
- ✚ Imaging of  $\beta$ -cells and amyloids
- ✚ Cancer targeted drug delivery systems

### 2016 AT A GLANCE

Publications with impact factor	6
Publications without impact factor	4
Books and chapters	2
Posters presentations	6
Congresses & Symposia	8
Number of projects at FNRS and assimilated	4
Projects of collaboration with the industry	3
Ph.D. Thesis presented in 2016	1
Awards	2
Patents	1

## STAFF

SENIOR LECTURER	Florence DELIE-SALMON	
LECTURER	Pascal FURRER	
EXCELLENCE FELLOWSHIP	Imène ATEB	
SENIOR RESEARCH AND TEACHING ASSISTANTS	Andrej BABIC	Laurence NEFF <i>(since 1.02.2016)</i>
POSTDOCTORAL SCHOLARS	Ester BOIX GARRIGA Karolina JANIKOWSKA	Cédric THAUVIN
RESEARCH AND TEACHING ASSISTANTS	Imène ATEB Jordan BOUILLOUX Carlota DE LACERDA SALGADO Viktorija HERCEG	Pierre MAUDENS Ioanna MYLONAKI Vassily VOROBIEV
INTERNSHIP STUDENTS – CO-SUPERVISION (CO-TUTELLE)	Bettina SCHWARZ <i>(since 1.10.2016)</i>	
ADMINISTRATIVE STAFF	Florence VON OW	
TECHNICAL STAFF	Nathalie BOULENS Carole DUPRAZ	Samuel ESPY <i>(since 1.11.2016)</i> Marco PERDIGAO

## RESEARCH FUNDS

### FNRS

Targeted photoablation of breast cancer through urokinase-sensitizer prodrugs

Main applicant : H. Acha-Orbea

Co-applicant : N. LANGE

total funding : CHF 203'000

Allocation 2016 : CHF 0.--

Duration : 3 years

Starting date : 01.04.2013

Precision nanoconstructed drug eluting balloon catheters for perixxx vascular diseases”KTI 18279.2 PFLS-LS)

Main applicant : E. ALLEMANN

Total funding : CHF 259'000.-

Allocation 2016 : CHF 0

Duration : 2 years

Starting date : 01.01.2016

Topical delivery of photosensitizers to atherosclerotic plaques and intra-arterial photodynamic therapy: a pre-clinical (CR3213\_150271/1)

Main applicant : S. Cook

Co-applicant : N. LANGE

Total funding : CHF 200'040.-

Allocation 2016 : CHF 0

Duration : 3 years

Starting date : 01.12.2013

Development of eco-friendly and healthy plant-based feeds for sustainable animal farming - KTI 18541.3 PFLS-LS”  
 Main applicant : J. Montoya Burgos  
 Co-applicant: E. ALLEMANN  
 Co-applicant : D. Sutherland  
 Total funding : CHF 363'622.-  
 Allocation 2016 : CHF 218'173.-  
 Duration : 2 years  
 Starting date : 01.12.2016

## FONDATION NOVARTIS CONSUMER HEALTH

Fondation Novartis Consumer Health  
 Main applicant : E. ALLEMANN  
 total Funding : CHF 70'000  
 Allocation 2016 : CHF 0  
 Duration : 1 year  
 Starting date : 1.04.2015

## INNOGAP ROUND 15 -UNITEC

Innogap Roud 15 - UNITEC  
 Main applicant : E. ALLEMANN  
 Total funding : CHF 30'000.-  
 Allocation 2016 : CHF 30'000.-  
 Duration : 1 year  
 Starting date : 01.09.2016

## FONDATION PRIVEE DES HOPITAUX UNIVERSITAIRES DE GENEVE

Fondation privée des hôpitaux universitaires de Genève: prix de l'innovation des HUG  
 Main applicant: E. ALLEMANN  
 Total funding: CHF 5'000.-  
 Allocation 2016 : CHF 5'000.-

## INDUSTRY AND ASSIMILATED

Code	Service - Development - Research	Total Amount for 2016 (CHF)
OM Pharma	Service	10'200
Sunstar	Service	25'700
TEOXANE	Service	16'400
Apidel	Service	13'700
Pharmacap	Service	1'000
Glenmark	Service	13'300
	<b>total</b>	<b>80'300</b>

## PUBLICATIONS

### THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

Biomaterials	8.39
Journal of Controlled Release	7.44
Nanomedicine : nanotechnology, biology and medicine	6.21
Bioconjugate chemistry	4.50
International Journal of Pharmaceutics	3.99
European Journal of Pharmaceutics and Biopharmaceutics	3.98
European Journal of Pharmaceutical Sciences	3.77
Journal of Pharmacology and experimental Therapeutics	3.76
Pharmaceutical research	3.26
Journal of Drug Targeting	2.82

### SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)

1. I. MYLONAKI, F. STRANO, S. DEGLISE, E. ALLEMANN, F. ALONSO, J.-M. CORPATAUX, C. DUBUIS, J. HAEFLIGER, O. JORDAN, F. SAUCY, F. DELIE. "Perivascular sustained release of atorvastatin from a hydrogel-microparticle delivery system decrease intimal hyperplasia, *Journal of Controlled Release* 232, 93-102 (2016) 7.44
2. A. BABIC, S. LAMPRIANOU, L. VINET, N. STRANSKY-HEILKRON, C. XAYAPHOUMMINE, M.-A. CAMPO, G. GLOMBIK, A. SCHULTE, H.-P. JURETSCHKE, X. MONTET, P. MEDA, N. LANGE. Multivalent glibenclamide to generate islet specific imaging probes, *Biomaterials*, 75:1-12 (2016) 8.38
3. J. PRADAL, P. MAUDENS, C. GABAY, C.-A. SEEMAYER, O. JORDAN. Effect of particle size on the biodistribution of nano- and microparticles following intra-articular injection in mice, *International Journal of Pharmaceutics*, 498, 119-129, (2016) 3.99
4. A. BABIC, V. HERCEG, E. ALLEMANN, N. LANGE. Tunable phosphatase-sensitive stable prodrugs of 5-aminolevulinic acid for tumor fluorescence photodetection, *Journal of Controlled Release*, 235, 155-164, (2016) 7.44
5. G. BOSO, D. KE, B. KORZH, J. BOUILLOUX, N. LANGE, H. ZBINDEN. Time-resolved singlet-oxygen luminescence detection with an efficient and practical semiconductor single-photon detector, *Biomedical Optics Express*, 7, 1, 211-224, (2016) 3.35
6. M. PLISSONNEAU, J. PANSIERI, L. HEINRICH-BALARD, J.-F. MORFIN, N. STRANSKY-HEILKRON, P. RIVORY, P. MOWAT, M. DUMOULIN, R. COHEN, E. ALLEMANN. Gd-nanoparticles functionalization with specific peptides for beta-amyloid plaques targeting, *Journal of Nanobiotechnology*, 14, 60 4.24

### SCIENTIFIC PUBLICATIONS (WITHOUT IMPACT FACTOR)

1. P. FURRER, P. LAURENT. Incompatibilités avec des tensioactifs, *PharmaJournal*, 06 :5-8, 2016
2. A. LAURENT, P. FURRER, P. LAURENT, M. MONOD. Onychomycoses : diagnostic et prise en charge, *PharmaJournal*, 09 :12-15, 2016
3. P. FURRER, P. LAURENT. Préparations désinfectantes iodées en Officine, *PharmaJournal*, 17 :5-9, 2016
4. P. FURRER, T. PHILBET. Toxicité du borax, rappel de l'ordre de l'OFSP, *PharmaJournal*, 22 :9-10, 2016

## BOOKS OR BOOKS CHAPTERS

1. J. BOUILLOUX, S. COLLAUD, N. LANGE. When Polymers See the Light – Applications in Photodynamic Therapy and Photodiagnosis, Handbook of Porphyrin Science, World Scientific (accepted for publication; 2016)
2. V. HERCEG, N. LANGE, E. ALLEMANN. Theranostics: in vivo. “Polymer nanoparticles: A Guide for Design, Preparation and Development as Nanomedicines”, Springer (2016)

## PRESENTATIONS

### POSTERS PRESENTATIONS

1. V. VOROBIEV, A. BABIC, J.-N. HYACINTHE, M. PUPIER, E. ALLEMANN. Hyperpolarized xenon biosensor as MRI contrast agent, Swiss Pharma Sciences Day, Bern, Switzerland, 31 August, 2016
2. V. HERCEG, A. BABIC, N. LANGE, E. ALLEMANN. Phosphatase-sensitive prodrugs for the systemic delivery of 5-aminolevulinic acid (5-ALA), Swiss Pharma Sciences Day, Bern, Switzerland, 31 August, 2016
3. P. MAUDENS, L. NEFF, C. THAUVIN, O. JORDAN, E. ALLEMANN. Nanocrystals of Kartogenin Loaded Particles for Cartilage Regeneration, Swiss Pharma Sciences Day, Bern, Switzerland, 31 August, 2016
4. C. SALGADO, E.F. QUEIROZ, N. AQUINO, C.Q. DA ROCHA, W. VILEGAS, J.-F. WOLFENDER, O. JORDAN, E. ALLEMANN. Large Scale Preparative Isolation of Dimeric Flavonoids from Arrabidaea brachypoda Root Extract, Swiss Pharma Sciences Day, Bern, Switzerland, 31 August, 2016
5. K. JANIKOWSKA, V. CHELLAKUDAM, A. EEK, M. BROM, A. BABIC, L. VINET, S. LAMPRIANOU, E. ALLEMANN, P. MEDA, M. GOTTHARDT, N. LANGE. Synthetic Exendin-4 Analogues for Imaging Pancreatic Beta Cells, Swiss Pharma Sciences Day, Bern, Switzerland, 31 August, 2016
6. V. HERCEG, A. BABIC, E. ALLEMANN, N. LANGE. Squalene nanoparticles for systemic delivery of 5-aminolevulinic acid, SFNano annual meeting, Paris, France, 12-14 December, 2016

### CONGRESSES & SYMPOSIA

1. A. MONTEILLIER, P. FURRER, E. ALLEMANN, M. CUENDET. Intranasal administration succeeds to overcome UG-46 low bioavailability and reveals its lung cancer chemopreventive activity, Swiss Cancer Center Lausanne Inaugural Symposium, Lausanne, 7-10 September, 2016
2. P. MAUDENS, L. NEFF, C. THAUVIN, O. JORDAN, E. ALLEMANN. Nanocrystals-Polymer Particles: a Novel Approach to Treat Osteoarthritis, 43<sup>rd</sup> Annual Meeting & Exposition of the Controlled Release Society, Seattle, USA, 17-20 July, 2016
3. A. BABIC, S. LAMPRIANOU, L. VINET, N. STRANSKY-HEILKRON, C. XAYAPHOUMMINE, M.-A. CAMPO, H. GLOMBIK, A. SCHULTE, H.-P. JURETSCHKE, X. MONTET, P. MEDA, N. LANGE. Phosphatase-Sensitive Stable Prodrugs of 5-aminolevulinic acid for Tumor Fluorescence Photodetection, WMIC, New York, 2016
4. N. LANGE. «From the dark side of biohotonics, Workshop on Molecular Theranostics: Towards Personalised Photomedicine, Barcelona, Spain, January 2016
5. E. ALLEMANN Intra-articular injection of particulate drugs: size matters, Scientific symposium, ETH, Zurich, 2016
6. E. ALLEMANN. Intra-articular delivery of drugs by means of nano- and microparticles, new avenues for the treatment of arthritic diseases, Asian Polymer Association International Conference, Advanced Polymers, Biomaterials, Bioengineering & Nano Drug Delivery, Flic-en-Flac, Mauritius, 2016
7. E. ALLEMANN. Local delivery of drugs by means of nano- and microparticles, new possibilities for the treatment of arthritic diseases, Research Symposium, Nanjing University of Chinese Medicine, China, 2016



8. E. ALLEMANN. Nanomedicines, History and industrial opportunities, Kick-of, meeting of NILE: Nanotechnology Innovation Laboratory Enterprise, a Ferring-Aché new company, Sao Paulo, 2016

## CONTINUING EDUCATION & OPEN TO THE PUBLIC LECTURES

1. P. FURRER. "Cours et atelier de formation continue pour le CAP (Centre d'Animation des Pharmaciens de Suisse): Aromathérapie IV, University of Geneva, Switzerland, 5 April & 11 November, 2016
2. P. FURRER. «Ocular drug delivery: state of the art and new concepts, Hotel Whyndam, Berlin, Germany, 20-21 June, 2016
3. P. FURRER. "Pharmacothérapie oculaire. Comment formuler un médicament?, Hôpital Jules-Gonin, Switzerland, 16 November, 2016
4. P. FURRER. «Cours de master en pharmacie et master en pharmacie industrielle MIP(Drug Delivery and Drug Targeting): Ophthalmic devices/dermopharmacy, EPFZ, Zürich, Switzerland, 6 December, 2016

## THESIS PRESENTED

### INTRA-MUROS THESIS

Nathalie STRANSKY-HEILKRON

"Development of contrast agents for imaging amyloids in type 2 diabetes – from chemical synthesis to in vivo trials"

University of Geneva - 2016

Thesis n° 4911 –

Directors: E. ALLEMAN, X MONTET

### THESIS JURY

Giuseppina PISIGNANO, University of Geneva

Katrin FUCHS, University of Geneva

Shukai DING, University of Strasbourg

Delphine CARLI-GHABAROU, University of Geneva

Ameena JESAIMANI, University of Geneva

Ester BOIX GARRIGA, University Ramon Llull

## PATENTS

E. ALLEMANN, O. JORDAN, P. MAUDENS. Hyaluronic acid conjugates and uses thereof, Eur. Pat. Appl. 2016

## AWARDS

P. MAUDENS, O. JORDAN, E. ALLEMANN, Innovation prize HUG, 2016

P. MAUDENS, O. JORDAN, E. ALLEMANN, Innovation prize Fongit/Ecllosion, 2016

# PHARMACOGNOSY



## PROFESSOR MURIEL CUENDET

### GENERAL DESCRIPTION OF THE UNIT

The pharmacognosy research unit is focused on the discovery of bioactive natural products. Compounds with cancer chemopreventive and antiparasitic activity are of particular interest. In these areas, the development of new and better drugs remains a principal need. As established by ample precedent, nature provides broad chemical diversity. Prevention is well developed in the field of cardiovascular disease, but similar drugs that could prevent cancer on this scale are still a long way off. A panel of in vitro bioassays indicative of inhibiting major stages of carcinogenesis (initiation, promotion and progression) is used. Mechanistic studies are then pursued with the most promising compounds. Also, most antiparasitic drugs available on the market (when available) have a limited efficacy and strong side effects. Some plant extracts having shown good in vitro and in vivo activity are currently being investigated to uncover the compounds responsible for the activity and their mechanism of action. The absorption and the metabolism of pure compounds and phytopreparations are also being evaluated in vitro and in vivo.

### SPECIFIC RESEARCH FIELDS

- ✚ Cancer chemopreventive screening of natural products: quinone reductase induction, epigenetic modulation, anti-inflammatory and anti-angiogenic activity
- ✚ Antiparasitic activity
- ✚ Activity-guided fractionation
- ✚ Absorption and metabolization studies of phytopreparations and pure natural products using Caco-2 cells and in vivo models
- ✚ In depth studies to uncover the mechanism of action of pure natural products and phytopreparations
- ✚ Natural products against multiple myeloma resistance

### 2016 AT A GLANCE

Publications with impact factor	15
Poster presentations	11
Congresses & Symposia	7
Number of projects at FNRS and assimilated	2
Number of projects with industries	2
PhD Thesis presented in 2016	1

## STAFF

VISITING PROFESSOR	Mohammad Sanad ABU-DARWISH	
SENIOR LECTURER	Philippe CHRISTEN	
EXCELLENCE FELLOWSHIP	Yanfei PENG	
SENIOR REASERCH ASSOCIATE	Sylvian CRETTON	
RESEARCH AND TEACHING ASSISTANTS	Olivier CICLET Mark ISSA Aymeric MONTEILLIER	Noémie SARAUX Chantal WALTER Vincent ZWICK
ADMINISTRATIVE STAFF	Natalie SCHREGLE	
TECHNICAL STAFF	Frédéric BORLAT	Colette SAUTY

## RESEARCH FUNDS

### FNRS

"Anticancer activity of selected medicinal plants from South of Jordan" (IZKOZ2\_169635 /1)  
Applicant: M. CUENDET  
Total allocation: CHF 5'200.--  
Allocation 2016: CHF 5'200.--  
Duration: 2 months  
Starting date: 2016

### EU FUNDING

Integrated technologies for the discovery and development of cosmeceutical agents from plant biodiversity.  
(NATPROTEC) IAPP-Marie Curie  
Main applicant: M. CUENDET  
Co-applicant: J. L. WOLFENDER  
Total allocation for the entire project: Euros 1'813'624  
Total allocation for M. CUENDET: CHF 263'225 (€ 222'131)  
Allocation 2016: CHF 10'326  
Duration: 4 years.  
Starting date: 2012

### DFAE – DÉPARTEMENT FÉDÉRAL DES AFFAIRES ÉTRANGÈRES (CONTRIBUTION FÉDÉRALE)

"NIGER: Plantasav" (7F05733.03.11)  
Applicant: P. CHRISTEN  
Total allocation: CHF 35'920.00  
Allocation 2016: CHF 28'736.00  
Duration: 1 year  
Starting date: 2016

### FONDATION SCHMIDHEINY

« Mise en place d'une méthode de criblage d'extraits de plantes et de composés naturels afin d'inhiber le développement de la bactérie *Waddlia chondrophila* »  
Applicant: C. WALTER, PhD student in the group of M. CUENDET  
Allocation 2016: CHF 15'000.00  
Starting date: 2016

## INDUSTRY AND ASSIMILATED

Code	Service - Development - Research	Total Amount for 2016 (CHF)
S17246	Research Fonds Intérêts (M. Cuendet) – Research & Services	83'661
	<b>total</b>	<b>83'661</b>

## PUBLICATIONS

### THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

Cancer Res	9.12
Cancer Prev Res	3.98
J Nat Prod	3.28
Phytochemistry	3.20
J Agr Food Chem	3.15
J Ethnopharmacol	2.98
Molecules	2.86
Bioorg Med Chem Lett	2.45
Planta Med	2.34
Phytochem Analysis	2.29

### SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)

1. S. BERTRAND, A. AZZOLLINI, A. NIEVERGELT, J. BOCCARD, S. RUDAZ, M. CUENDET, J. L. WOLFENDER. "Statistical correlations between HPLC activity-based profiling results and NMR/MS microfractions data to deconvolute bioactive compounds in mixture". *Molecules*, 21 (2016) 259 2.86
2. R. CINCINELLI, V. ZWICK, L. MUSSO, V. ZUCO, M. DE CESARE, F. ZUNINO, C. SIMOES-PIRES, A. NURISSE, G. GIANNINI, M. CUENDET, S. DALLAVALLE. "Biphenyl-4-yl-acrylohydroxamic acids: identification of a novel indolyl-substituted HDAC inhibitor with antitumor activity". *European Journal of Medicinal Chemistry*, 112 (2016) 99-105 6.25
3. S. CRETTON, S. DORSAZ, A. AZZOLLINI, Q. FAVRE-GODAL, L. MARCOURT, S. EBRAHIMI, F. VOINESCO, E. MICHELLOD, D. SANGLARD, K. GINDRO, J. L. WOLFENDER, M. CUENDET, P. CHRISTEN. "Antifungal quinoline alkaloids from *Waltheria indica*". *Journal of Natural Products*, 79 (2016) 300-307 3.28
4. S. DEL RIO-SANCHO, C. CROS, B. COUTAZ, M. CUENDET, Y. N. KALIA. "Cutaneous iontophoresis of  $\mu$ -conotoxin CnIIIc-A potent Nav1.4 antagonist with analgesic, anaesthetic and myorelaxant properties". *International Journal of Pharmaceutics*, 518 (2016) 59-65 3.64
5. M. E. ISSA, S. BERNDT, G. CARPENTIER, J. M. PEZZUTO, M. CUENDET. "Bruceantin inhibits multiple myeloma cancer stem cell proliferation". *Cancer Biology and Therapy*, 17 (2016) 966-975 3.29
6. N. KACEM, V. ROUMY, N. DUHAL, F. MEROUANE, C. NEUT, P. CHRISTEN, K. HOSTETTMANN, S. RHOUATI. "Chemical composition of the essential oil from Algerian *Genista quadriflora* Munby and determination of its antibacterial and antifungal activities". *Industrial Crops and Products*, 90 (2016) 87-93 3.18
7. R. NELSON, V. KESTERNICH, M. PÉREZ-FEHRMANN, S. JALDIN, L. MARCOURT, P. CHRISTEN. "Regiospecific synthesis of 1,4,5-trisubstituted 1,2,3-triazoles via enolate-azide cycloaddition". *Journal of Chemical Research*, 40 (2016) 453-457 0.66

8. S. ORTIZ, R. NELSON, V. KESTERNICH, M. PÉREZ-FEHRMANN, P. CHRISTEN, L. MARCOURT. 0.48  
 "Synthesis and antifungal activity of diaryl hydrazones from 2,4-dinitrophenylhydrazine".  
 Journal of the Chilean Chemical Society 61 (2016) 3081-3084
9. C. PETIT, A. BUJARD, K. SKALICKA-WOŹNIAK, S. CRETTON, J. HOURIET, P. CHRISTEN, 2.34  
 P. A. CARRUPT, J. L. WOLFENDER. "Prediction of the passive intestinal absorption of  
 medicinal plant extract constituents with the Parallel Artificial Membrane Permeability  
 Assay (PAMPA)". Planta Medica, 82 (2016) 424-431
10. O. S. SAKR, S. BERNDT, G. CARPENTIER, M. CUENDET, O. JORDAN, G. BORCHARD. 7.78  
 "Arming embolic beads with anti-VEGF antibodies and controlling their release using LbL  
 technology". Journal of Controlled Release, 224 (2016) 199-207
11. M.L. ZERAIK, E.F. QUEIROZ, L. MARCOURT, O. CICLET, I. CASTRO-GAMBOA, D.H.S. SILVA, 3.14  
 M. CUENDET, V. BOLZANI, J. L. WOLFENDER. "Antioxidants, quinone reductase inducers  
 and acetylcholinesterase inhibitors from *Spondias tuberosa* fruits". Journal of Functional  
 Foods, 21 (2016) 396-405
12. V. ZWICK, P.M. ALLARD, L. ORY, C. SIMOES-PIRES, L. MARCOURT, K. GINDRO, 2.29  
 J. L. WOLFENDER, M. CUENDET: "UHPLC/MS-based HDAC assay applied to bio-guided  
 microfractionation of fungal extracts". Phytochemical analysis, 28 (2016) 93-100
13. V. ZWICK, A. NURISSO, C. SIMOES-PIRES, N. MARTINET, A. LEHOTZKY, J. OVADI, 2.45  
 M. CUENDET, C. BLANQUART, P. BERTRAND. "Cross metathesis with hydroxamate and  
 benzamide BOC-protected alkenes to access HDAC inhibitors and their biological  
 evaluation highlighted intrinsic activity of BOC-protected dihydroxamates". Bioorganic &  
 Medicinal Chemistry Letters, 26 (2016) 154-159
14. V. ZWICK, C. SIMOES-PIRES, M. CUENDET. 4.29  
 "Cell-based multi-substrate assay coupled to UHPLC-ESI-MS/MS for a quick identification of class-specific HDAC inhibitors". Journal of  
 Enzyme Inhibition and Medicinal Chemistry, 31 (2016) 209-214
15. V. ZWICK, C. SIMOES-PIRES, A. NURISSO, C. PETIT, C. DOS SANTOS PASSOS, 2.45  
 G. M. RANDAZZO, N. MARTINET, P. BERTRAND, M. CUENDET. "Synthesis of a selective  
 HDAC6 inhibitor active in neuroblasts". Bioorganic & Medicinal Chemistry Letters, 26,  
 (2016) 4955-4959

## PRESENTATIONS

### POSTERS PRESENTATIONS

1. M. E. ISSA, M. CUENDET. Withaferin A induces cell death and differentiation in multiple myeloma cancer stem cells in vitro. 2016 International Symposium in Chemical Biology, Geneva, Switzerland, January 13-15, 2016
2. W. L. PU, L. MIAO, Y.Y. LUO, Y.F. PENG, Y.S. ZHANG, A.W. GUO, M.S.C. GEBAUER, K. ZHOU, Y. GENG, E.X. LI, C. RUEGG, M. CUENDET, X.M. GAO, M.O. HOTTIGER, L.K. SUN. Compounds of Chinese herbs prevent pancreatic cancer initiation and progression by regulating the inflammatory microenvironment. Waring Foundation Symposium on "Novel Frontiers in Pancreatic Diseases", Zurich, Switzerland, May 26, 2016
3. S. CRETTON, P. M. ALLARD, I. GARCIA-GOMEZ, K. ANHEUSER, B. WASTIAU, J. L. WOLFENDER, M. CUENDET, P. CHRISTEN. Modern tools to analyse museum samples of curare and psychoactive preparations used by Amazonian tribes. 9th Joint Natural Products Conference, Copenhagen, Denmark, July 24-27, 2016
4. V. ZWICK, C.A. SIMOES-PIRES, L. ORY, P.M. ALLARD, J. L. WOLFENDER, M. CUENDET. A UHPLC/MS-MS-based HDAC assay applied to bio-guided microfractionation of fungi extracts. 9th Joint Natural Products Conference, Copenhagen, Denmark, July 24-27, 2016

5. S. CRETTON, P.M. ALLARD, I. GARCIA-GOMEZ, K. ANHEUSER, B. WASTIAU, J. L. WOLFENDER, M. CUENDET, P. CHRISTEN. Modern tools to analyse museum samples of curare and psychoactive preparations used by Amazonian tribes. 9th Swiss Pharma Science Day, Bern, Switzerland, August 31, 2016
6. M.E. ISSA, S. BARTA, A. MONTEILLIER, E. M. K. WIJERATNE, A. A. L. GUNATILAKA, M. CUENDET. The in vitro cytotoxic effect of withanolides in multiple myeloma cancer stem cells and tumoral cells. 9th Swiss Pharma Science Day, Bern, Switzerland, August 31, 2016
7. A. MONTEILLIER, P.M. ALLARD, K. GINDRO, J. L. WOLFENDER, M. CUENDET. NF- $\kappa$ B inhibition of patulin isolated from *Penicillium vulpinum* via an IKK independent mechanism. 9th Swiss Pharma Science Day, Bern, Switzerland, August 31, 2016
8. N. SARAUX, P. CHRISTEN, M. CUENDET. Biological activities of plants from Niger used in traditional medicine. 9th Swiss Pharma Science Day, Bern, Switzerland, August 31, 2016
9. A. MONTEILLIER, P. M. ALLARD, K. GINDRO, J. L. WOLFENDER, M. CUENDET. NF- $\kappa$ B inhibition of patulin isolated from *Penicillium vulpinum* via an IKK independent mechanism. 30<sup>ème</sup> Séminaire en Sciences pharmaceutiques, Zermatt, Switzerland, September 5-9, 2016
10. M. E. ISSA, M. CUENDET. Withaferin A targets multiple myeloma cancer stem cells in vitro. ISREC-Swiss Cancer Center Lausanne, Inaugural Symposium, Lausanne, Switzerland, September 7-10, 2016
11. A. MONTEILLIER, P. FURRER, E. ALLÉMANN, M. CUENDET. Intranasal administration succeeds to overcome resveratrol low bioavailability and reveals its lung cancer chemopreventive activity. ISREC-Swiss Cancer Center Lausanne, Inaugural Symposium, Lausanne, Switzerland, September 7-10, 2016

## CONGRESSES & SYMPOSIA

1. A. ARREDONDO-NÚÑEZ, P. CHRISTEN, S. CRETTON, J. TAPIA, O. MUÑOZ, R. BUSTAMANTE. Chemical ecology of *Eschscholtzia californica*: Comparing alkaloid content between native and invaded ranges. VIII Southern Connection Congress 2016, Punta Arenas, Chile, January 18-23, 2016
2. S. CRETTON, M. CUENDET, P. CHRISTEN. Chemical constituents from *Waltheria indica* and their biological activities. V Congreso Iberoamericano de Productos Naturales, Bogotá, Colombia, April 25-29, 2016
3. A. OYARZÚN, P. CUADRA, P. CHRISTEN, L. MARCOURT, V. FAJARDO. Phytochemical study of *Gavilea lutea* (Comm. ex Pers.) M. N. Correa. V Congreso Iberoamericano de Productos Naturales, Bogotá, Colombia, April 25-29, 2016
4. M. CUENDET. The use of natural products to treat multiple myeloma. Xi'an hospital, Xi'an, China, May 13, 2016
5. M. CUENDET. Ambivalent role of genistein in sprouting angiogenesis. 16<sup>th</sup> International Congress of the International Society for Ethnopharmacology, Yulin, China, May 16-18, 2016
6. M. CUENDET. Natural products targeting multiple myeloma cancer stem cells. 7<sup>th</sup> International PharmSci Conference, Glasgow, United Kingdom, September 5-7, 2016
7. P. CHRISTEN. 1996-2016: 20 years of collaboration in natural products research. IX International Symposium on Natural Products Chemistry and Applications, Termas de Chillan, Chile, November 22-25, 2016

## THESIS

### INTRA-MUROS THESIS

Vincent ZWICK

“HDAC inhibitors from natural and synthetic libraries:  
towards the development of biochemical probes”

Thesis No 4985 - September 12, 2016

Co-directors: M. CUENDET, P.-A. CARRUPT

### THESIS JURY

Lionel SACCONAY,

“*In silico*-driven strategies for the identification of novel sirtuin modulators”

Thesis N° 4904 - February 26, 2016, University of Geneva

Co-directors: P.-A. CARRUPT, A. NURISSO

L. CURTI,

“EZH2 induces methylation of ERG enhancing its transcriptional and transforming activity”

Thesis N° 4913 - March 11, 2016, University of Geneva

Director: L. SCAPOZZA



# PHARMACOCEMISTRY

DR ALESSANDRA NURISSO, EXCELLENCE FELLOWSHIP

DR CLAUDIA SIMOES PIRES, SENIOR RESEARCH

## GENERAL DESCRIPTION OF THE UNIT

The team of pharmacocemistry developed original theoretical and experimental methods able to quantify intermolecular interactions of a drug with its biological partners such as therapeutic targets or biological membranes. This research intended to accelerate the discovery of chemical compounds of therapeutic interest and to optimize the effectiveness, the selectivity and the safety of the selected drug candidates. They were centered on the development and validation of in silico and in vitro HTS filters to characterize physicochemical properties, passive membrane permeation and cellular efflux of new chemical entities. Virtual and in vitro HTS screening approaches were optimized to study the interactions with some specific bio-targets involved in neurodegenerative diseases like Alzheimer and Parkinson's diseases were measured in order to identify multifunctional drug candidates.

## SPECIFIC RESEARCH FIELDS

Biochemical screening: enzyme Inhibition; antioxidant profiling of NCEs; antiapoptotic properties of NCEs; enzymatic hydrolysis of drugs and prodrugs; inhibition of hERG channel; inhibition of HDAC and SIRT proteins.

Molecular modelling: Intermolecular interaction fields; indirect molecular modelling; direct molecular modelling.

Physicochemical screening: Physicochemical profiling; antioxidant properties.

Permeation screening: passive permeation profiling using PAMPA-membranes to mimic the skin, the intestinal barrier and the blood-brain barrier. 3D-QSAR models associated with proteins responsible of cellular efflux in membrane permeation or multi-drug resistance.

## 2016 AT A GLANCE

Publications with impact factor	17
Posters presentations	2
Congresses & Symposia	3
Ph.D. Thesis presented in 2016	4
Awards	1

## STAFF

### POSTDOCTORAL SCHOLARS

Carolina DOS SANTOS PASSOS

### RESEARCH AND TEACHING ASSISTANTS

Nathalie DESCHAMPS

Lionel SACONNAY

Charlotte PETIT

Vincent ZWICK

Stéphanie ROMAND

### INTERNSHIP STUDENTS – CO-SUPERVISION (CO-TUTELLE)

Chiara TORTIA

### ADMINISTRATIVE STAFF

Sylvia PASSAQUAY

### TECHNICAL STAFF

Christophe FRANCEY

Emilie REGINATO

## PUBLICATIONS

### THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

Drug Discovery Today	5.62
J.Med.Chem	5.58
J.Chem.Info.Model	3.90
Eur.J.Med.Chem.	3.90
J.Comp.Aided Drug Des.	3.19
Curr Topics Med. Chem.	3.09
Chem.Med.Chem.	2.98
Bioorgan.Med.Chem.	2.92

### SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)

1. V. ZWICK, PM. ALLARD, L. ORY, C. SIMÕES-PIRES, L. MARCOURT, K. GINDRO, J. L. WOLFENDER, M. CUENDET. UHPLC/MS-based HDAC assay applied to bio-guided microfractionation of fungal extracts. *Phytochem. Ana.l* 2016, OnLine. 2.50
2. V. ZWICK, C. SIMÕES-PIRES, A. NURISSO, C. PETIT, C. PASSOS, G. M. RANDAZZO, N. MARTINET, F. BERTRAND, M. CUENDET. Synthesis of a selective HDAC6 inhibitor active in neuroblasts. *Bioorg. Med. Chem. Lett.*, 26: 4855-4859, 2016. 2.49
3. V. ZWICK, C. SIMÕES-PIRES, M. CUENDET. Cell-based multi-substrate assay coupled to UHPLC-ESI-MS/MS for a quick identification of class-specific HDAC inhibitors. *J. Enz. Inhib. Med. Chem.*, 31: 209-214, 2016, 2.50
4. L. GORACCI, N. DESCHAMPS, G. M. RANDAZZO, C. PETIT, C. DOS SANTOS PASSOS, P. A. CARRUPT, C. SIMÕES-PIRES, A. NURISSO. A rational approach for the identification of non-hydroxamate HDAC6-selective inhibitors. *Sci. Rep.*, 6: 29086, 2016. 5.23
5. C. PASSOS, C. SIMÕES-PIRES, P. A. CARRUPT, A. NURISSO. Molecular dynamics of zinc-finger ubiquitin binding domains: a comparative study of histone deacetylase 6 and ubiquitin-specific protease 5. *J. Biomol. Struc. Dyn.*, 34: 2581-2598, 2016. 2.30
6. R. CINCINELLI, V. ZWICK, L. MUSSO, V. ZUCO, M. DE CESARE, F. ZUNINO, C. SIMÕES-PIRES, A. NURISSO, G. GIANNINI, M. CUENDET, S. DALLAVALLE. Biphenyl-4-yl-acrylohydroxamic acids: identification of a novel indolyl-substituted HDAC inhibitor with antitumor activity. *Eur. J. Med. Chem.*, 112: 99-105, 2016. 3.90
7. L. SACCONNAY, L. RYCKEWAERT, G.M. RANDAZZO, C. PETIT, C. S. PASSOS, J. JACHNO, V. MICHAILOVIENÉ, A. ZUBRIENÉ, D. MATULIS, P. A. CARRUPT, C. SIMÕES-PIRES, A. NURISSO. 5-Benzylidene-hydantoin is a new scaffold for SIRT inhibition: from virtual screening to activity assays. *Eur. J. Pharm. Sci.*, 85: 59-67, 2016. 3.77
8. V. ZWICK, A. NURISSO, C. SIMÕES-PIRES, S. BOUCHET, N. MARTINET, A. LEHOTZKY, J. OVADI, M. CUENDET, C. BLANQUART, P. BERTRAND. Cross metathesis with hydroxamate and benzamide BOC-protected alkenes to access HDAC inhibitors and their biological evaluation highlighted intrinsic activity of BOC-protected dihydroxamates. *Bioorg. Med. Chem. Lett.*, 26: 154-159, 2016. 2.48
9. A. LANDREAU, S. BERTRAND, C. SIMÕES-PIRES, L. MARCOURT, D.B. TAÏ, M. LITAUDON, D. GUILLET, P. RICHOMME, P. A. CARRUPT, J. L. WOLFENDER. Normal phase HPLC-based activity profiling of non-polar crude plant extracts – acetylcholinesterase inhibiting guttiferones from *Montrouziera cauliflora* as a case study. *Nat. Prod. Res.*, 24:2754-2759, 2016. 1.06
10. L. SACCONNAY, P. A. CARRUPT, A. NURISSO. Human sirtuins: structures and flexibility. *J. Struct. Biol.*, 196(3):534-542, 2016. 3.37

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| 11. | A. MEGUELLATI, A. AHMED-BELKACEM, A. NURISSO, W. YI, R. BRILLET, N. BERQOUCH, L. CHAVOUTIER, A. FORTUNE', J. M. PAWLITSKY, A. BOUMENDJEL, M. PEUCHMAUR. New pseudodimeric auronones as palm pocket inhibitors of Hepatitis C virus RNA-dependent RNA polymerase. <i>Eur. J. Med. Chem.</i> ,115: 217-29, 2016. | 3.77 |
| 12. | G. M. RANDAZZO, D. TONIOLI, S. HAMBYE, D. GUILLARME, F. JEANNERET, A. NURISSO, L. GORACCI, J. BOCCARD, S. RUDAZ. Prediction of retention time in reversed-phase liquid chromatography as a tool for steroid identification. <i>Anal. Chim. Acta</i> , 916:8-16, 2016.  | 4.51 |
| 13. | S. MARTEL, F. BEGNAUD, W. SCHULER, F. GILLERAT, N. OBERHAUSER, A. NURISSO, P. A. CARRUPT. Limits of rapid log P determination methods for highly lipophilic and flexible compounds. <i>Anal. Chim. Acta</i> , 915:90-101, 2016.  | 4.51 |
| 14. | N. MALKOV, J. FLIEGMANN, C. ROSENBERG, V. GASCIOLLI, A. C. TIMMERS, A. NURISSO, J. CULLIMORE, J. J. BONO. Molecular basis of lipo-chitooligosaccharide recognition by the lysin motif receptor-like kinase LYR3 in legumes. <i>Biochem. J.</i> , 473(10):1369-78, 2016.  | 3.56 |
| 15. | C. PETIT, A. BUJARD, K. WOZNIAK, S. CRETTON, J. HOURIET, P. CHRISTEN, P. A. CARRUPT, J. L. WOLFENDER. Prediction of the Passive Intestinal Absorption of Medicinal Plant Extract Constituents with the Parallel Artificial Membrane Permeability Assay (PAMPA). <i>Planta Med.</i> , 82(5):424-31, 2016.       | 2.15 |
| 16. | S. ROMAND, D. SPIAGGIARI, N. MARSOUSI, C. SAMER, J. DESMEULES, Y. DAALI, S. RUDAZ. Characterization of oxycodone in vitro metabolism by human cytochromes P450 and UDP-glucuronosyltransferases. <i>J. Pharm. Biomed. Anal.</i> , S0731-7085(16)30696-3, 2016.   | 2.97 |
| 17. | S. ROMAND, S. RUDAZ, D. GUILLARME. Separation of substrates and closely related glucuronide metabolites using various chromatographic modes. <i>J. Chromatogr. A</i> , 1435:54-65, 2016.   | 3.14 |

## PRESENTATIONS

### POSTERS PRESENTATIONS

1. V. ZWICK, C. A. SIMÕES-PIRES, L. ORY, P. M. ALLARD, K. GINDRO, J. L. WOLFENDER, M. CUENDET. A UHPLC/MS-MS-based HDAC assay applied to bio-guided micro-fractionation of fungi extracts. 9th Joint Natural Products Conference, 24-27 July 2016, Copenhagen (Denmark).
2. C. DOS SANTOS PASSOS, A. NURISSO, P.A. CARRUPT, C. SIMOES-PIRES. In vitro characterization of HDAC6 protein-protein interactions with ubiquitin and ubiquitin-like proteins. 3<sup>rd</sup> NovAliX Conference: Biophysics in Drug Discovery 2016, 7-10 June 2016, Strasbourg (France).

### ORAL PRESENTATIONS

1. C.A. SIMÕES-PIRES. "Natural products and epigenetic targets". Phytonezwerk-Meeting, 28 June 2016, Wädenswil (Switzerland).

### CONGRESSES & SYMPOSIA

1. C. SIMÕES-PIRES. Phytonezwerk-Meeting, 28 June 2016, Wädenswil (Switzerland).
2. C. SIMÕES-PIRES. 9<sup>th</sup> Joint Natural Products Conference, 24-27 July 2016, Copenhagen (Denmark).
3. C. DOS SANTOS PASSOS. 3<sup>rd</sup> NovAliX Conference: Biophysics in Drug Discovery 2016, 7-10 June 2016, Strasbourg (France).

## CONTINUING EDUCATION & OPEN TO THE PUBLIC LECTURES

1. C. SIMÕES-PIRES.  
Technical vocabulary for Biology and Chemistry technicians.  
Ecole des métiers du laboratoire (ECLAB). Geneva (Switzerland). Lectures (24 h).
2. A. NURISSO.  
Computer-aided drug design: methods and applications.  
UE optionnelle Master ISM. Université Grenoble-Alpes (France). Lectures (6 h).

## THESIS PRESENTED

### INTRA-MUROS THESIS

Lionel SACCONNAY

«In silico-driven Strategies for the Identification of Novel Sirtuin Modulators»

Thesis N° 4904 - University of Geneva – 2016 –

Directors : P.-A. CARRUPT, J.-L. VEUTHEY, A. NURISSO

Stéphanie ROMAND

«Nouvelles approches in vitro pour l'étude de la physico-chimie et du métabolisme de phase II de composés pharmaceutiques»

Thesis N° 4978 - University of Geneva – 2016 –

Directors: P.-A. CARRUPT, S. RUDAZ

Vincent ZWICK

HDAC inhibitors from natural and synthetic libraries: towards the development of biochemical probes.

Thesis N° 4985 - University of Geneva – 2016 –

Directors: P.-A. CARRUPT, M. CUENDET

Charlotte PETIT

Towards a Prediction of Intestinal Absorption of Medicinal Plant Constituents with the PAMPA Permeability Assay.

Thesis N° 5029 - University of Geneva – 2016 –

Directors: P.-A. CARRUPT, J.-L. WOLFENDER

### THESIS JURY

Sini RADHAKRISHNAN

Development of Tyrosinase Inhibitors.

Faculty of Science School of Mathematical and Physical Sciences, University of Technology Sydney, 25

July 2016 Sydney (Australia).

Jury member: A. NURISSO

Mohamed Dit Mady TRAORE

Synthèse et études de modélisation moléculaire dans l'optimisation de la sélectivité de nouveaux agents antiparasitaires inspirés de produits naturels.

Université Grenoble Alpes, 15 novembre 2016, Grenoble (France).

Jury member: C. SIMOES-PIRES

## AWARDS & DISTINCTIONS

C. DOS SANTOS PASSOS, best poster prize.

In vitro characterization of HDAC6 protein-protein interactions with ubiquitin and ubiquitin-like proteins. 3rd NovAliX Conference: Biophysics in Drug Discovery 2016, 7-10 June 2016, Strasbourg (France).

# CLINICAL PHARMACY SCIENCES



## PROFESSOR CHANTAL CSAJKA

### GENERAL DESCRIPTION OF THE UNIT

The mission of the Sciences in clinical pharmacy group is to promote post-marketing drug optimisation revolving around three main axes. The first research focus is therapeutic individualisation by the comprehension of the demographic, physiopathologic, environmental or genetic determinants influencing therapeutic response or toxicity. The second axis comprises research on security and efficacy of drugs, in particular in vulnerable population (pediatrics, geriatrics, oncology) and third research focus is the development of tools and guidelines allowing for therapeutic optimisation. The methods used are based on quantitative and qualitative techniques, including modeling and simulations and epidemiological studies. The overall goal of the research is to increase the knowledge on the pharmacokinetics and pharmacokinetic-pharmacodynamic relationships of commercialized drugs at particular risk and to improve safety and efficacy in order to improve their use in clinical practice.

### SPECIFIC RESEARCH FIELDS

The following achievements have been done in 2016.

- a) Drug individualisation. Several projects on the pharmacokinetic characterisation of antiretroviral and psychoactive drugs have been fulfilled, with direct implication in clinical practice. In the field of HIV, a new research line has been opened focusing on the modeling of metabolic traits, in collaboration with the Swiss HIV Cohort Study. It will provide a better comprehension of the development of drug-related toxicity in the HIV population. A SNF grant has been granted to study drug-drug interaction of HIV drugs in the elderly population. In Oncology, the clinical study aiming at better defining therapeutic targets of tyrosine kinase inhibitors and adherence patterns of patients under long-term treatment is ongoing.
- b) Drug efficacy and security. The multicentric study evaluating antidepressant use during pregnancy and lactation and supported by the SNF has provided first analytical results on drug concentrations in blood and breast milk as well as new data on transplacental transfer of those drugs along with new insight of the genetic influence on it. A first analysis of citalopram/escitalopram allowed the quantification of drug level trough lactation and estimation of the risk for breastfeeding women.
- c) Tools for drug optimisation in clinical practice. The collaborative project with the EPFL and the HEIG-VD supported by the Nano-Tera project of the SFN aiming at developing a software ([www.ezechiel.ch](http://www.ezechiel.ch)) for Bayesian dosage adjustment is still ongoing (ISyPeM: Intelligent Integrated Systems for Personalized Medicine, [www.nano-tera.ch/projects/405.php](http://www.nano-tera.ch/projects/405.php) and ISyPeM II, [www.nano-tera.ch/projects/368.php](http://www.nano-tera.ch/projects/368.php)). Through a funded PNR74 project, we are starting a new line of research for the automatic detection of adverse drug events related to antithrombotic use in the geriatric population through structured data mining and natural language processing. This Swiss Project involving 5 hospitals (Geneva, Lausanne, Sion, Zürich and Baden) will allow the implementation of algorithms for risk management optimisation in hospitals.

### 2016 AT A GLANCE

Publications with impact factor	9
Publications without impact factor	1
Posters presentations	7
Congresses & Symposia	2
Number of projects at FNRS and assimilated	2
Projects of collaboration with the industry	1

## STAFF

### SENIOR RESEARCH ASSOCIATE

Monia GUIDI

### RESEARCH AND TEACHING ASSISTANTS

Catalina BARCELO

Etienne WEISSKOPF

Evelina CARDOSO

Wenyuan XIONG

Akram FAHRAT

### INTERNSHIP STUDENTS-CO-SUPERVISION (CO-TUTELLE)

Anaïs GLATARD

### ADMINISTRATIVE STAFF

Dominique HUNZIKER

## RESEARCH FUNDS

### FNRS

Prediction of infant drug exposure to antidepressant drugs through breastfeeding using population pharmacokinetic modeling and simulation

Main applicant: C. CSAJKA

Co-applicants : J.F. TOLSA, C.B. EAP

Total Funding: CHF 288'000.-

Allocation 2016: 0.--

Duration 4 years

Starting date: 1.4.2012

Modeling, simulation and clinical validation of drug interactions in the Swiss HIV Cohort Study (FN 324730\_165956)

Main applicant : L. Decosterd

Co-applicants : C. CSAJKA, T. Buclin

Total Funding : CHF 430'500.—

Allocation 2016 : CHF 100'000.—

Duration : 3 years

Starting date : 1.5.2016

### SWISS CANCER LEAGUE – ACCENTUS GRANT

Main applicant : M.-P. SCHNEIDER

Co-applicants : C. CSAJKA, D. Wagner

Total Funding : CHF 248'200.--

Duration : 4 years

Allocation 2016 : CHF 62'000.--

Starting date : 1.6.2016

## INDUSTRY AND ASSIMILATED

Code	Service - Development - Research	Total Amount for 2016 (CHF)
DEB-EOC-2013	Service	
		<b>total 32'400</b>

## PUBLICATIONS

### THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

Clinical Pharmacology and Therapeutics	7.26
Clinical Pharmacokinetics	5.05
Antimicrobial Agents and Chemotherapy	4.47
British journal of clinical pharmacology	3.83
Antiviral Therapy	3.02
Expert Opinion On Drug Safety	2.89
Biomarkers in Medicine	2.17
Therapeutic drug monitoring	2.09
Journal of clinical pharmacy and therapeutics	1.83

### SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)

1. C. CSAJKA, S. CRETOL, M. GUIDI, C. B. EAP. Population Genetic-Based Pharmacokinetic Modeling of Methadone and its Relationship with the QTc Interval in Opioid-Dependent Patients. *Clin Pharmacokinet.* 2016 Dec;55(12):1521-1533. 5.21
2. M. AOURI, C. BARCELO, M. GUIDI, M. ROTGER, M. CAVASSINI, C. HIZREL, T. BUCLIN, L. A. DECOSTERD, C. CSAJKA; Swiss HIV Cohort Study Population Pharmacokinetics and Pharmacogenetics Analysis of Rilpivirine in HIV-1-Infected Individuals. *Antimicrob Agents Chemother.* 2016 Dec 27;61(1). pii: e00899-16. doi: 10.1128/AAC.00899-16. Print 2017 Jan. 4.56
3. E. WEISSKOPF, A. PANCHAUD, K. A. NGUYEN, D. GROSJEAN, J. M. HASCOËT, C. CSAJKA, C. B. EAP, N. ANSERMOT; collaborators of the SSRI-Breast Milk study. Stereoselective determination of citalopram and desmethylcitalopram in human plasma and breast milk by liquid chromatography tandem mass spectrometry. *J Pharm Biomed Anal.* 2016 Nov 30;131:233-245. 3.25
4. A. PANCHAUD, C. CSAJKA. Outbreak in meldonium positive laboratory tests: are we missing something? *Br J Sports Med.* 2016 Nov;50(22):1422-1423. 6.72
5. C. BARCELÓ, F. GASPAR, M. AOURI, A. PANCHAUD, M. ROTGER, M. GUIDI, M. CAVASSINI, T. BUCLIN, L. A. DECOSTERD, C. CSAJKA; Swiss HIV Cohort Study. Population pharmacokinetic analysis of elvitegravir and cobicistat in HIV-1-infected individuals. *J Antimicrob Chemother.* 2016 Jul;71(7):1933-42. 5.07
6. A. CORBEL, D. BAUD, A. CHAOUCH, J. BENEY, C. CSAJKA, A. PANCHAUD. Utility of an Algorithm to Increase the Accuracy of Medication History in an Obstetrical Setting. *PLoS One.* 2016 Mar 21;11(3):e0151205. 2.80
7. A. PANCHAUD, E. R. DI PAOLO, A. KOUTSOKERA, U. WINTERFELD, E. WEISSKOPF, D. BAUD, A. SAUTY, C. CSAJKA. Safety of Drugs during Pregnancy and Breastfeeding in Cystic Fibrosis Patients. *Respiration.* 2016; 91(4):333-48. 2.40
8. A. FUCHS, A. ROTZINGER, M. CAVASSINI, O. BUGNON, T. BUCLIN, M. P. SCHNEIDER, C. CSAJKA. Comparison of Population Pharmacokinetics Based on Steady-State Assumption Versus Electronically Monitored Adherence to Lopinavir, Atazanavir, Efavirenz, and Etravirine: A Retrospective Study. *Ther Drug Monit.* 2016 Aug;38(4):506-15. [Impact Factor 2.376]. 2.37
9. M. WILBAUX, A. FUCHS, J. SAMARDZIC, F. RODIEUX, C. CSAJKA, K. ALLEGAERT, J. N. DEN ANKER, M. PFISTER. Pharmacometric Approaches to Personalize use of Primarily Renally Eliminated Antibiotics in Preterm and Term Neonates. *J Clin Pharmacol.* 2016 Aug;56(8):909-35. 2.47



## SCIENTIFIC PUBLICATIONS (WITHOUT IMPACT FACTOR)

1. E. WEISSKOPF, C. J. FUMEAUX, M. BICKLE GRAZ, M. M. HARARI, M. EPINEY, C. B. TOLSA, S. ROUILLER, J. F. TOLSA, C.-B. EAP, Y. VIAL, C. CSAJKA, A. PANCHAUD. SSRI antidepressant use during pregnancy and the assessment of the risk-benefit ratio. Rev Med Suisse. 2016 Mar 16;12(510):561-6. French.

## PRESENTATIONS

### POSTERS PRESENTATIONS

1. M. GUIDI, C. CSAJKA, A. HAOUALA, A. MÉNÉTREY, E. ROUITS. Population pharmacokinetic analysis of the IAPs antagonist Debio 1143 and its major metabolite in oncologic patients. Poster PAGE Lisboa 2016.
2. S. PETITPREZ, Y. THOMA, Y. SUTTER, R. HOOPER, M. ARAB-ALAMEDDINE, T. BUCLIN, C. CSAJKA, M. GUIDI. Population pharmacokinetic meta-analysis of seven antiretroviral drugs. Poster PAGE Lisboa 2016.
3. M. AOURI, M. GUIDI, C. BARCELO, M. CAVASSINI, T. BUCLIN, L. A. DECOSTERD, C. CSAJKA. and the Swiss HIV Cohort Study. Population pharmacokinetics analysis of dolutegravir in HIV-1 infected individuals. PAGE Lisboa 2016
4. A. GLATARD, M. GUIDI., M. DOBRINAS, J. CORNUZ, C. CSAJKA, C. B. EAP. Influence of UGT2B7 polymorphism on varenicline clearance in a cohort of smokers from the general population. PAGE Lisboa 2016.
5. C. BARCELÓ, F. GASPAR, M. AOURI, A. PANCHAUD, M. ROTGER, M. GUIDI, M. CAVASSINI, T. BUCLIN, L. A. DECOSTERD, C. CSAJKA, and the Swiss HIV Cohort Study. Population pharmacokinetics analysis of elvitegravir and cobicistat in HIV-1 infected individuals. PAGE Lisboa 2016.
6. A. CHAOUCH, R. HOOPER, C. CSAJKA, V. ROUSSON, Y. THOMA, T. BUCLIN. Performance of Individualized Bayesian Dosage Adjustment for Voriconazole: a simulation study, NanoTera Annual Meeting (poster), Lausanne, Suisse, Avril 2016
7. A. CHAOUCH, R. HOOPER, C. CSAJKA, V. ROUSSON, Y. THOMA, T. BUCLIN. Building a posteriori percentiles for Therapeutic Drug Monitoring, congrès PAGE (poster), Lisbonne, Portugal, Juin 2016

### CONGRESSES & SYMPOSIA

1. C. CSAJKA, P. GIRARD. Pharmacokinetics and Pharmacodynamics of Protein Therapeutics. Co-organisers of the workshop, Lausanne, March 2016.
2. C. CSAJKA. Population Approach Group in Europe (PAGE): Co-organiser of the scientific program of the congress, Budapest, June 2016.

### CONTINUING EDUCATION & OPEN TO THE PUBLIC LECTURES

1. C. CSAJKA. Suivi thérapeutique pharmacologique: zoom sur l'imatinib et l'erlotinib. 4<sup>ème</sup> journée de pharmacologie des antitumoraux, Paris, December 2016.
2. C. CSAJKA. Utilité de la modélisation PK pour l'individualisation posologique bayésienne des ITKs. XVII<sup>es</sup> Journées du groupe de pharmacologie clinique oncologique, Toulouse, November 2016
3. C. CSAJKA. Activités de pharmacie clinique: entre Savoir, Savoir faire et Savoir être. Congrès francophone de pharmacie hospitalière Hopipharm, Clermont-Ferrand, May 2016.

## THESIS PRESENTED

### INTRA-MUROS THESIS

Etienne WEISSKOPF

Antidepressant treatments during pregnancy and lactation: prediction of drug exposure through breastfeeding and evaluation of drug effect on the neonatal adaptation and the development of the young child

University of Geneva – 2016 –

thesis N° 4904

Supervisor : Prof. C. CSAJKA

### THESIS JURY

Sylvain GOUTELLE. Rôle de la pharmacologie quantitative dans l'évaluation, l'individualisation et l'optimisation des traitements médicamenteux. Thèse d'habilitation HRD, University Claude Bérard Lyon.

Laure LALANDE. Modélisation de la pathologie et du traitement de la tuberculose : application à l'isoniazide. Thèse de doctorat, University Claude Bérard Lyon

Stéphanie ROMAND. Nouvelles approches in vitro pour l'étude de la physico-chimie et du métabolisme de phase II de composés pharmaceutiques Thèse de doctorat, Université de Genève

Nathalie STRANSKY. Development of Contrast Agents for Imaging Amyloids in Type 2 Diabetes – From Chemical Synthesis to In Vivo Trials. Thèse de doctorat, Université de Genève.

# COMMUNITY PHARMACY PRACTICE



## PROFESSOR OLIVIER BUGNON

### GENERAL DESCRIPTION OF THE UNIT

The fact of prescribing, recommending or swallowing a drug seems banal and yet there are many traps: side effects, insufficient effectiveness, too high costs, non-adherence, waste, lack of motivation, altered quality of life, etc. These topics, as well as the evolution of advanced pharmacy services are considered as priorities of action for academic and clinical activities of the Community Pharmacy Center of the PMU (Policlinique Médicale Universitaire), a unique place in Switzerland, which combines practice, research, development and education.

Olivier Bugnon, chief pharmacist of the Community Pharmacy Center of the PMU, is on the other hand an Associate Professor at the School of pharmaceutical sciences (University of Geneva, University of Lausanne); with his group, he participates in the research and development of Community Pharmacy practice, a clinical pharmaceutical science which respects the public health priorities and the central role of the patient. His main teaching responsibility is the organization of the second year of the Master in Pharmacy (year of assistantship). He supervises the examinations of the Master and is member of the Federal Committee for the State Exam in Pharmacy. His research activities (8 PhD students in pharmaceutical sciences in 2016) explore ways of collaboration between physicians, pharmacists and other health care workers to improve the responsible use of medicines (effectiveness, safety, efficiency, positive patient-related outcomes).

### SPECIFIC RESEARCH FIELDS

The research of the Community Pharmacy Center at the PMU covers the three following areas:

#### 1. PEOPLE- / PERSON-CENTERED AND INTEGRATED CARE

The global trend for health systems is people- and person-centeredness, coordination, networking and continuity of care. Pharmacists are at the interface of the treatments prescribed by the physicians and the OTC treatments. The evolution of their role turns towards collaborative pharmacy practice and e-health strategies, aiming at the global quality of the care and control of the health care costs. In 2016, the Community Pharmacy Center of the PMU worked on the following topics and projects:

- Evaluation of the Quality circles physicians-pharmacists-nurses in nursing homes (cantonal projects in Fribourg and Vaud), including study of the opportunities and limits of deprescribing in nursing homes.
- Risk evaluation and mitigation strategies – REMS (e.g. multiple sclerosis patients, home-based subcutaneous immunoglobulin, patients with oral anticancer medications)
- Exploration of e-Health strategies facilitating the interprofessional collaboration and the person-centeredness (e.g. shared e-medication plan in the canton of Vaud; web-platform SISPha®)
- Exploration of change management strategies facilitating the implementation of advanced cognitive pharmacy services (e.g. implementation of the interprofessional SISCare® concept)
- Animation of the network of the pharmacists specialized in Addiction Medicine in the French-speaking part of Switzerland - COROPHA (project supported by the FOPH and COROMA)

*The research on people-/person-centered and integrated care is closely linked to the two other areas « medication adherence » (e.g. oncology, multiple sclerosis) and « safety and cost effectiveness of drugs » (e.g. in geriatrics). This research involves cross-sectional scientific collaborations between pharmaceutical, medical, human and economic sciences.*

#### 2. MEDICATION ADHERENCE

The daily and prolonged taking of medicine is difficult for chronic patients, especially in case of side effects, complex treatments, lack of motivation, incomprehension or refusal of the treatment. Stopping or forgetting to take one's medicine is nevertheless a normal human behavior. The medication adherence defines itself as a dynamic active process in which the patient works to maintain his health in collaboration with the medical team.

The researchers of the Community Pharmacy Center of the PMU, in collaboration with various physicians and nurses, are interested in the scientific support and evaluation of the medication adherence in the routine care in domains like for example high blood pressure, VIH infections, diabetes, multiple sclerosis, oral anticancer medications, transplantations. The adherence programs (see M. Lelubre et al. *BioMed Research International. Volume 2015 (2015), Article ID 103546, 10 pages*) are concretized by:

- Motivational, semi-structured interviews, lead by a pharmacist;
- The measure of medication adherence through an electronic medication pillbox and it's relation with the effects of the therapy;
- The sharing of data collected in pharmacies (e.g. persistence, implementation, side effects, preferences of patients and their relatives) within the patient and the healthcare workforce.

*The research on the medication adherence also contributes to the goals of the area « people-/person-centered and integrated care ».*

### 3. SAFETY AND COST EFFECTIVENESS OF DRUGS

Drugs represent the option most frequently used by the physicians. The prescription formalizes the therapeutic plan with the concordance of the patient; it represents an essential communication tool for the collaboration with the pharmacist. Drug related problems experienced by the patients and medication errors are too frequent. They are usually a sign of system failure, a cost factor and breaks of the seamless care: many good reasons to study scientifically the provided services likely to manage drug risk as well as to improve safety, effectiveness and efficiency of the medicines.

*This research area is naturally closely linked with the two other areas « medication adherence » and « people-/person-centered and integrated care ».*

## 2016 AT A GLANCE

Publications with impact factor	6
Publications without impact factor	22
Books and chapters	9
Posters presentations	17
Congresses & Symposia	24
Projects of collaboration with the industry	4
Ph.D. Thesis presented in 2016	1

## STAFF

### SENIOR LECTURER

Jérôme BERGER

### RESEARCH ASSOCIATE AND SENIOR

### RESEARCH ASSOCIATE

Marie-Paule SCHNEIDER  
VOIROL

### POSTDOCTORAL SCHOLAR

Mélanie LELUBRE

### RESEARCH AND TEACHING

Aline BOURDIN

Jennifer CELIO

### ASSISTANTS

Damien CATEAU

Susan KAMAL ABDELRAHMAN

### INTERNSHIP STUDENTS – CO- SUPERVISION (CO-TUTELLE)

Noura BAWAB (*Student,  
University libre de Bruxelles*)

### ADMINISTRATIVE STAFF

Dominique HUNZIKER

## RESEARCH FUNDS

### FEDERAL OFFICE OF PUBLIC HEALTH (FOPH)

Elaboration of the Federal Exam for Pharmacy 2015  
Participation des experts de la Section des sciences pharmaceutiques (University of Geneva, University of Lausanne) - (Contract No. 16.015619 / 704.0001/ -685) -  
Main applicant: O. BUGNON  
Allocation 2016: CHF 378'922  
Duration: 1 year

Scientific evaluation of a person-centered and integrated care concept for Type-2 Diabetes patients (SISCare®-DT2]  
(Contract No. 15.003846 / 604.0001/ -434)  
Main applicants: O. BUGNON (PMU/EPGL) et C. ROSSIER (SISPha SA)  
Total allocation : CHF 216'000  
Allocation 2016: CHF 48'600  
Duration: 4 years  
Starting date: 2015

### CANTONAL OFFICE OF PUBLIC HEALTH - VAUD

Development, implementation and evaluation of a the cantonal interprofessionnal programme « Physicians-Nurses-Pharmacists quality circles in nursing homes »  
Main applicant: O. BUGNON  
Total allocation : CHF 300'000  
Allocation 2016: CHF 30'000  
Duration: 10 years  
Starting date: 2007

Organisation and animation of a Quality circle physicians-pharmacists-nurses in the nursing homes of the « Fondation Asile des Aveugles (FAA) »]  
Main applicant: O. BUGNON et J. BERGER  
Allocation 2016: CHF 32'267  
Duration: 1 year  
Starting date: 2016

## INDUSTRY AND ASSIMILATED

Code	Service - Development - Research	Total Amount for 2016 (CHF)
SA6	Recherche et development	50'000
TA11	Recherche et development	30'000
CP3	Formation	9'700
ME5	Formation	12'400
S4h	Formation	11'200
PH15	Formation	1'0001
ETC	Formation	3'000
ESC	Formation	300
ONE	Formation	600
SPFR	Formation	670
PHGE	Formation	500
PHA11	Formation	7'000
GI6	Formation	300
NUTS	Formation	2'500
PDOM	Formation	2'500

V5f	Formation	6'000
T6D	Formation	3'000
N6E	Formation	2'700
SA6	Formation	3'000
	<b>total</b>	<b>146'370</b>

## PUBLICATIONS

### THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

American Journal of Health System Pharmacy	1.98
Annals of Pharmacotherapy	2.92
Disease Management and Health Outcomes	0.34
International Journal of Pharmacy Practice	1.26
Journal of Clinical Pharmacy and Therapeutics	1.53
Journal of Managed Care Pharmacy	2.68
Patient Education and Counselling	2.59
Pharmacy Practice (www.pharmacypractice.org)	PR
Revue Médicale Suisse	Indexé Pub Med

### SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)

1. C. PERRAUDIN, O. BUGNON, N. PELLETIER-FLEURY : " Expanding professional pharmacy services in European community setting: is it cost-effective ? A systematic review for health policy considerations" *Health Policy* . 120, pp1350-62 (2016) 2.03
2. C. PERRAUDIN, A. BOURDIN, F. SPERTINI, J. BERGER, O. BUGNON: "Switching patients to home-based subcutaneous immunoglobulin: an economic evaluation of an interprofessionnal drug therapy management program". *J Clin Immunol.* 36(5), pp 502-10 (2016) 3.09
3. A. ROTZINGER, I. LOCATELLI, O. BUGNON, A. FAYET MELLO, J. J. PARIENTI, M. CAVASSINI, M. P. SCHNEIDER: "Switching from a two-tablet regimen of tenofovir/emtricitabine and efavirenz to a one-tablet regimen may affect patients' perceptions and drug management". *HIV Medicine* 17, pp 390-396 (2016). 3.34
4. A. ROTZINGER, M. CAVASSINI, O. BUGNON, M. P. SCHNEIDER: "Development of an algorithm for analysing the electronic measurement of medication adherence in routine HIV care". *Int J Clin Pharm* 38, pp 1210–1218 (2016) 1.33
5. A. ROTZINGER, I. LOCATELLI, M. REYMERMIER, S. AMICO, O. BUGNON, M. CAVASSINI, M. P. SCHNEIDER: "Association of disclosure of HIV status with medication adherence" *Patient Education and Counseling* 99, pp 1413–1420 (2016) 2.23
6. A. FUCHS, A. ROTZINGER, M. CAVASSINI, O. BUGNON, T. BUCLIN, M. P. SCHNEIDER, C. CSAJKA: "Comparison of Population Pharmacokinetics Based on Steady-State Assumption Versus Electronically Monitored Adherence to Lopinavir, Atazanavir, Efavirenz, and Etravirine: A Retrospective Study". *Ther Drug Monit* 38(4), pp506-515 (2016) 2.37

### SCIENTIFIC PUBLICATIONS (WITHOUT IMPACT FACTOR)

1. I. ANGUISH, J. F. LOCCA, T. MALKA, O. BUGNON: « Gestion des risques liés au circuit du médicament dans les établissements médico-sociaux du canton de Fribourg (Suisse) – Etat des lieux 2012-2014 et nouvelle responsabilité des pharmaciens » *Pharmactuel* 2016 ; 49 (1) : 41-48. [Article peer-reviewed ; indexé dans l'*International Pharmaceutical Abstract*]

2. R. GAUTHIER, J. BERGER, O. BUGNON : « Rhinite aiguë non-allergique - Quel est le traitement de premier choix? » *pharmaJournal* 01 | 1.2016
3. R. GAUTHIER, J. BERGER, O. BUGNON : « Akute nicht-allergische Rhinitis Welche Therapie ist die 1. Wahl? » *pharmaJournal* 01 | 1.2016
4. J. BERGER, J. DE MOOIJ, D. HUGENTOBLE, O. BUGNON : « *En pratique - Les traitements de la gale* » *pharmaJournal* 05 | 3.2016
5. J. BERGER, J. DE MOOIJ, D. HUGENTOBLE, O. BUGNON : « *Aus der Praxis – Therapie der Scabies* » *pharmaJournal* 05 | 3.2016
6. J. SAVARY, R. GAUTHIER, D. HUGENTOBLE, J. BERGER, O. BUGNON : « *En pratique - Quel traitement conseiller lors de maux de gorge bénins?* » *pharmaJournal* 08 | 4.2016
7. J. SAVARY, R. GAUTHIER, D. HUGENTOBLE, J. BERGER, O. BUGNON : « *In der Praxis - Welche Behandlungen sind bei gutartigen Halsschmerzen empfehlenswert?* » *pharmaJournal* 08 | 4.2016
8. N. BENNANI, J. DE MOOIJ, O. BUGNON, J. BERGER : « Stupéfiants et benzodiazépines - Bon usage des substances soumises à contrôle » *pharmaJournal* 12 | 6.2016
9. N. BENNANI, J. DE MOOIJ, O. BUGNON, J. BERGER : « Betäubungsmittel und Benzodiazepine - Good Practice bei kontrollierten Substanzen » *pharmaJournal* 12 | 6.2016
10. A. LACHKAR; R. GAUTHIER; O. BUGNON; J. BERGER : « *Interactions médicamenteuses – Attention au pamplemousse* » *pharmaJournal* 15 | 6.2016
11. A. LACHKAR; R. GAUTHIER; O. BUGNON; J. BERGER : « *Arzneimittelinteraktionen - Achtung bei Grapefruit* » *pharmaJournal* 15 | 6.2016
12. Y. DUBOIS, L. OCHSENBEIN, D. HUGENTOBLE, O. BUGNON, J. BERGER : « *Interactions pharmacocinétiques avec le calcium - Risque de diminution d'absorption* » *pharmaJournal* 18 | 8.2016
13. Y. DUBOIS, L. OCHSENBEIN, D. HUGENTOBLE, O. BUGNON, J. BERGER : « *Pharmakokinetische Interaktionen mit Calcium - Gefahr von verminderter Resorption* » *pharmaJournal* 18 | 8.2016
14. S. DU PASQUIER, N. BERTHOLET, O. BUGNON, J. BERGER : « *Dépendance à l'alcool - Prise en charge* » *pharmaJournal* 19 | 9.2016
15. S. DU PASQUIER, N. BERTHOLET, O. BUGNON, J. BERGER : « *Alkoholabhängigkeit - Behandlung nach neuesten Standards* » *pharmaJournal* 19 | 9.2016
16. R. GAUTHIER, D. HUGENTOBLE, O. BUGNON, J. BERGER : « *Retrait du sucralfate - Des alternatives remboursées* » *pharmaJournal* 21 | 10.2016
17. R. GAUTHIER, D. HUGENTOBLE, O. BUGNON, J. BERGER : « *Rückzug von Sucralfat - Kostenübernahme von alternativen Therapien* » *pharmaJournal* 21 | 10.2016
18. S. AUER, J. BERGER, P. STAEGER : « La trousse du médecin de garde: propositions - On-Call Doctor's Black Bag: Proposals » *Praxis* 2016; 105 (19): 1125–1131
19. L. MICHAUD, G. LUDWIG, S. BERNEY, S. RODRIGUES, A. NIQUILLE, V. SANTACHI, A.S. FAVRE, A. C. LANGE, A. A. MICHELS, B. VRIJENS, O. BUGNON, N. PILON, M. PASCUAL, J. P. VENETZ, F. STIEFEL, M. P. SCHNEIDER: "Immunosuppressive therapy after solid-organ transplantation: does the INTERMED identify patients at risk of poor adherence?". *Pharmacy Practice* 14(4), 822 (2016). [Indexed in PubMed]
20. M. BAUWENS, M. P. SCHNEIDER, D. NANCHEN. "Adhésion aux statines: mise à jour et plan d'action". *Rev Med Suisse* 12, pp 445-450 (2016). [Indexé dans Pubmed]
21. A. ROTZINGER, M. CAVASSINI, O. BUGNON, M. P. SCHNEIDER. "Travail de thèse : L'adhésion médicamenteuse lors de l'infection au VIH" *pharmaJournal* 07(3), pp19-21 (2016).
22. M. MOMBELLI, C. PLÜSS-SUARD, A. NIQUILLE, G. ZANETTI, N. BOILLAT-BLANCO : « *Antimicrobial stewardship en pratique communautaire* », *Rev Med Suisse* 2016 ; 12 : 744-8. [Indexé dans PubMed]



## BOOKS OR BOOKS CHAPTERS

1. M. P. SCHNEIDER, J. CELIO, Y. VAN CAMP, M. CAVASSINI. "Interventions to improve adherence to drug treatment". In: Drug Utilization Research: Methods and Applications. M. ELSEVIERS, B. WETTERMARK, A.B. ALMARSDOTTIR et al., Ed. Wiley-Blackwell (2016)
2. R. GAUTHIER, J. BERGER : « Prévention et prise en charge de la rhinite médicamenteuse » Actualité Médicaments - N° I / 2016 (intranet PMU)
3. A. LACHKAR ; R. GAUTHIER ; J. BERGER : « Interactions médicamenteuses avec le pamplemousse » Actualité Médicaments - N° II /2016 (intranet PMU)
4. J. CELIO, J. BERGER, O. BUGNON : « Palexia® (tapentadol) : antalgique à action centrale » Actualité Médicaments - N° 04/2013 (mise à jour février 2016) (intranet PMU)
5. J. SAVARY, R. GAUTHIER, J. BERGER : « Quel traitement prescrire lors de maux de gorge bénins ? » Actualité Médicaments - N° IV/2016 (intranet PMU)
6. N. BENNANI, J. DE MOOIJ, J. BERGER : « Les stupéfiants et benzodiazépines : bon usage des substances soumises à contrôle » Actualité Médicaments - N° 5/2016 (intranet PMU)
7. R. GAUTHIER, D. HUGENTOBLER, J. BERGER : « Ulcogant® : Alternatives de prises en charge par l'assurance de base » Actualité Médicaments - N° 6/2016 (intranet PMU)
8. C. ROCHAT, E. RESENTERRA, J. BERGER: "Désinfectants pour les surfaces et le matériel non immergeable » Actualité Médicaments - N° 7/2016 (intranet PMU)
9. L. PERRIARD, R. GAUTHIER, J. BERGER: « Collyres et interactions : prudence surtout avec les  $\beta$ -bloquants » Actualité Médicaments - N° 8/2016 (intranet PMU)

## PRESENTATIONS

### POSTERS PRESENTATIONS

1. Y. MICHIELS, O. BUGNON, A. CHICOYE, B. VERGES, C. MOISAN, H. MECHIN, F. A. ALLAERT. Impact d'un protocole délivré en pharmacie d'officine sur l'adhésion des patients diabétiques de type 2 à leur traitement oral : IPhODia , étude randomisée en cluster contre pratique habituelle. Congrès annuel de la Société francophone du diabète, Lyon, France, march 22-25, 2016.
2. J. CELIO, S. MAEDER, G. HALABI, P. BALLABENI, O. BUGNON, M. PRUIJM, M. P. SCHNEIDER. Chronic dialysis, medication adherence and beliefs about medicines: a comparison between patients born in Switzerland and migrant patients (diana qualitative study). European society of clinical pharmacy (ESCP) workshop, Basel, Switzerland, June 10-11, 2016.
3. Y. MICHIELS, O. BUGNON, A. CHICOYE, B. VERGES, C. MOISAN, H. MECHIN, F. A. ALLAERT. Impact of a community pharmacy-based information program on type 2 diabetic patients' adherence to their oral treatment : IPhODia, a cluster randomized study vs usual practice. European society of clinical pharmacy (ESCP) workshop, Basel, Switzerland, June 10-11, 2016.
4. J. CELIO, D. DUARTE VAQUINHAS NOBRE, F. LAMINE, M. PRUIJM, G. WUERZNER, C. CLAIR, M. BURNIER, O. BUGNON, A. ZANCHI, M. P. SCHNEIDER. Patients with diabetes and chronic kidney disease: an interdisciplinary program to support medication adherence (PANDIA IRIS STUDY). Forum Managed Care, Bern, Switzerland, June 15, 2016.
5. D. CATEAU, A. NIQUILLE, O. BUGNON. Potentiel de déprescription dans les EMS fribourgeois: analyse épidémiologique. Forum Managed Care, Bern, Switzerland, June 15, 2016.
6. C. PERRAUDIN, C. BREMOND, J. CORNUZ, A. GOUVEIA, O. BUGNON. Plan de traitement réconcilié et suivi coordonné pour les patients polymédiqués à la Policlinique médicale universitaire (PMU) de Lausanne. Symposium national des soins intégrés, Berne, Switzerland, June 15, 2016.

7. S. KAMAL, I. LOCATELLI, A. SEHHAT, M. METRAL, O. BUGNON, R. DU PASQUIER, M. CAVASSINI, M. P. SCHNEIDER. The impact of HIV Neurocognitive Disorders (HAND) on adherence to combined Antiretroviral Therapy (cART). SSID (Swiss Society of Infectious Diseases), Montreux, Switzerland, September 1, 2016.
8. C. PERRAUDIN, J. F. LOCCA, C. ROSSIER, O. BUGNON, M. P. SCHNEIDER. Financial strategy decision in the implementation of an adherence intervention in community pharmacies. Symposium of Clinical Pharmacy Switzerland 2016, Universität Basel, Departement Pharmazeutische Wissenschaften, Basel, Switzerland, September 14, 2016.
9. A. BOURDIN, M. P. SCHNEIDER, I. LOCATELLI, M. SCHLUEP, J. BERGER, O. BUGNON. Adherence to fingolimod in multiple sclerosis patients taking part in a person-centred integrated care programme in Switzerland. European Committee for Treatment and Research in Multiple Sclerosis, London, United Kingdom, September 14-17, 2016.
10. A. BOURDIN, M. P. SCHNEIDER, I. LOCATELLI, M. SCHLUEP, J. BERGER, O. BUGNON. Adherence to fingolimod in multiple sclerosis patients taking part in a person-centred integrated care programme in Switzerland. Symposium of Clinical Pharmacy Switzerland 2016, Universität Basel, Departement Pharmazeutische Wissenschaften, Basel, Switzerland, September 14, 2016.
11. J. CELIO, S. MAEDER, G. HALABI, P. BALLABENI, O. BUGNON, M. PRUIJM, M. P. SCHNEIDER. Chronic dialysis, medication adherence, beliefs about medicines and migration background (DIANA STUDY). Symposium of Clinical Pharmacy Switzerland 2016, Universität Basel, Departement Pharmazeutische Wissenschaften, Basel, Switzerland, September 14, 2016.
12. R. EL RAHAL, S. DU PASQUIER, J. BERGER, O. BUGNON. Experiences and attitudes of patients with the management of insomnia – Observational study Symposium of Clinical Pharmacy Switzerland 2016, Universität Basel, Departement Pharmazeutische Wissenschaften, Basel, Switzerland, September 14, 2016.
13. J. CELIO, S. MAEDER, G. HALABI, P. BALLABENI, O. BUGNON, M. PRUIJM, M. P. SCHNEIDER. Chronic dialysis, medication adherence, beliefs about medicines and migration background (DIANA STUDY). 20th Annual meeting European Society for Patient Adherence, COMpliance, and Persistence (ESPACOMP), Lisbon, Portugal, November 17-19, 2016.
14. S. KAMAL, O. BUGNON, M. CAVASSINI, M. P. SCHNEIDER. HIV patients' beliefs about their chronic co-treatments in comparison with their combined antiretroviral therapy (cART). ESPACOMP (European Society for Patient Adherence, COMpliance and Persistence), Lisbon, Portugal, November 17-19, 2016.
15. C. PERRAUDIN, J. F. LOCCA, C. ROSSIER, O. BUGNON, M. P. SCHNEIDER. Financial strategy decision in the implementation of an adherence intervention in community pharmacies. 20th Annual meeting European Society for Patient Adherence, COMpliance, and Persistence, Lisbon, Portugal, November 17-19, 2016.
16. A. BOURDIN, M. P. SCHNEIDER, I. LOCATELLI, M. SCHLUEP, J. BERGER, O. BUGNON. Adherence to fingolimod in multiple sclerosis patients taking part in a person-centred integrated care programme in Switzerland. 20<sup>th</sup> Annual meeting European Society for Patient Adherence, COMpliance, and Persistence, Lisbon, Portugal, November 17-19, 2016.
17. M. LELUBRE, O. CLERC, M. GROSJEAN, K. AMIGHI, C. DE VRIESE, O. BUGNON, M. P. SCHNEIDER. Implementation study related to an interdisciplinary antiretroviral adherence program for HIV patients in community pharmacies. 20th Annual meeting European Society for Patient Adherence, COMpliance, and Persistence (ESPACOMP), Lisbon, Portugal, November 17-19, 2016.

## CONGRESSES & SYMPOSIA

1. M. P. SCHNEIDER. "L'adhésion thérapeutique dans les maladies silencieuses: bilan d'une approche interdisciplinaire. Colloque des Maladies Silencieuses", Morges, Switzerland, January 7, 2016.
2. A. NIQUILLE, M. P. SCHNEIDER, N. SENN, L. KERBOAS, J. CORNUZ. "Etre auteur d'un article scientifique". 3<sup>rd</sup> Annual Research Symposium, PMU, Lausanne, Switzerland, January 14, 2016.

3. O. BUGNON. "La collaboration médecins-pharmaciens dans le cadre de l'axe stratégique de soins coordonnés à la PMU de Lausanne", Journée des Policliniques Lausanne-Genève, February 4, 2016, Lausanne
4. O. BUGNON, C. BREMOND, C. PERRAUDIN, J. BERGER. « Interprofessionnalité autour du médicament : cercles de qualité en EMS et plans de traitement partagés », Atelier, Journée des Policliniques Lausanne-Genève, February 4, 2016, Lausanne
5. F. SENECHAUD, O. BUGNON « Actualité de l'assistance pharmaceutique en EMS » Symposium interdisciplinaire annuel des EMS fribourgeois et vaudois « Vitamines, minéraux, suppléments protéinés, etc. : Alimentation « médicalisée » et plaisir de manger en EMS ». AFIPA, Société de Médecine du canton de Fribourg, Société des pharmaciens du Canton de Fribourg, AVDEMS, FEDEREMS, GMEMS et Société de Pharmacie du canton de Vaud. Sous le patronage des services de la santé publique des cantons de Fribourg et Vaud, March 3, 2016, Lausanne.
6. O. BUGNON. « 1. Nouveautés dans la pharmacothérapie du diabète de type 2 ; 2. Expérience pilote de « client-mystère » dans les pharmacies d'Antananarivo. », Symposium de l'Ordre des Pharmaciens de Madagascar, Antananarivo, March 31, 2016
7. J. CELIO, O. BUGNON. « 1. Pourquoi parler d'interprofessionnalité? 2. Quand et comment créer une collaboration interprofessionnelle ? », Symposium Pharmacie on top 2016 : « L'interprofessionnalité, au-delà du concept théorique : Faire le premier pas vers l'autre ». Organisation : MEPHA Pharma SA avec le soutien de SISPha SA. Montreux (avril 21, 2016), Lausanne (may 2, 2016), Lugano (may 23, 2016).
8. M. P. SCHNEIDER, S. KAMAL, A. ROTZINGER, Y. VALLET, T. GLASS, A. CALMY, O. BUGNON, J. J. PARIENTI, M. CAVASSINI. "Does an adherence-enhancing program increase retention in care in the Swiss HIV Cohort?" 1<sup>st</sup> minisymposium on health communication Switzerland, Bern, Switzerland, June 7, 2016
9. S. KAMAL, I. LOCATELLI, A. SEHHAT, M. METRAL, O. BUGNON, R. DU PASQUIER, M. CAVASSINI, M. P. SCHNEIDER. "The impact of HIV Neurocognitive Disorders (HAND) on adherence to combined Antiretroviral Therapy (cART)". ESCP (European society of clinical pharmacy), Basel, Switzerland, June 10, 2016.
10. M. P. SCHNEIDER "Electronic pill monitoring and chip in a pill. Session entitled 'Assessment of drug adherence: is there a gold standard?'" 26<sup>th</sup> European Meeting on Hypertension and Cardiovascular Protection, Paris, France, June 10-12, 2016.
11. S. KAMAL, I. LOCATELLI, A. SEHHAT, M. METRAL, O. BUGNON, R. DU PASQUIER, M. CAVASSINI, M. P. SCHNEIDER. "The impact of HIV Neurocognitive Disorders (HAND) on adherence to combined Antiretroviral Therapy (cART)." SHCS (Swiss HIV cohort Study) retreat, Bern, Switzerland, June 22, 2016.
12. O. BUGNON « Current and future community pharmacy services : implementation and remuneration – Swiss case history », SIMPODADER International, Granada, Spain, June 24, 2016.
13. M. P. SCHNEIDER. "IT use to improve medication adherence and provide feedback on patient status. Session entitled 'Technology to engage patients'". 76<sup>th</sup> FIP World Congress of Pharmacy and Pharmaceutical Sciences, Buenos Aires, Argentina, August 28-Sept 1, 2016
14. M. P. SCHNEIDER. "Novel strategies for detecting information on adherence to medication regimens. Session entitled 'Can pharmacovigilance shed light on adherence?'" 76<sup>th</sup> FIP World Congress of Pharmacy and Pharmaceutical Sciences, Buenos Aires, Argentina, August 28-Sept 1, 2016.
15. O. BUGNON. « Taking basic science to the patient and back – The contribution of innovative community pharmacy. », 30<sup>ème</sup> Séminaire en Sciences pharmaceutiques – PhD program in Pharmaceutical sciences « Molecular therapeutics – Discovery, development and delivery », Zermatt, Switzerland, September 5-9, 2016.
16. J. CELIO, S. MAEDER, G. HALABI, P. BALLABENI, O. BUGNON, M. PRUIJM, M. P. SCHNEIDER. "Chronic dialysis, medication adherence, beliefs about medicines and migration background (DIANA STUDY)." Symposium of Clinical Pharmacy Switzerland 2016, Universität Basel, Departement Pharmazeutische Wissenschaften, Basel, Switzerland, September 14, 2016.
17. K. HERSBERGER, O. BUGNON, P. BONNABRY, M. LAMPERT, C. R. MEIER. „Moderated discussion and conclusions with all Professors“, Symposium of Clinical Pharmacy Switzerland 2016, Universität Basel, Department Pharmazeutische Wissenschaften, Basel, September 14, 2016.

18. O. BUGNON. "How can we get good relationship between physicians and pharmacists in a local area? Practice example in the Lausanne district (quality circles, medication adherence, risk management plans)", The 49<sup>th</sup> JPA Congress of Pharmacy and Pharmaceutical Science in Aichi, Nagoya, Japan, October 9, 2016.
19. O. BUGNON. "System therapeutics and Science based practice: the need for collaborating among community pharmacists and academics", Conference as visiting professor in Josai International University, Togane, Japan, October 12, 2016.
20. O. BUGNON. « *Educating better clinicians* », Day 1 Changing Today and Tomorrow's Workforce. Global Conference on Pharmacy & Pharmaceutical Sciences Education. Organisers : International Pharmaceutical Federation (FIP) and the Chinese Pharmaceutical Association, in Nanjing, China, November 7-8, 2016.
21. O. BUGNON (chairman), K. GALBRAITH (facilitator), E. PAULINO (rapporteur). « Workshop 6 : Educating for advanced practice », Day 2 Changing Education. Global Conference on Pharmacy & Pharmaceutical Sciences Education. Organisers : International Pharmaceutical Federation (FIP) and the Chinese Pharmaceutical Association, in Nanjing, China, November 7-8, 2016.
22. M. P. SCHNEIDER. "The Lausanne medication adherence program: what's new? Session entitled 'Practical session on managing adherence in the real world'". 20th Annual Symposium of ESPACOMP (European Society for Patient Adherence, COMpliance and Persistence), Lisbon Portugal, November 17-19, 2016
23. M. P. SCHNEIDER. "Educational initiatives in medication adherence." 20th Annual Symposium of ESPACOMP (European Society for Patient Adherence, COMpliance and Persistence), Lisbon, Portugal, November 17-19, 2016
24. O. BUGNON. « Notre rôle dans les soins médicaux de premier recours – L'Université : la source des compétences et de leur évaluation scientifique », Forum Pharmacie 2016. Organisateurs : Société vaudoise de Pharmacie, Swiss Young Pharmacists Group et MEPHA. Lausanne, Suisse, November 26, 2016

## CONTINUING EDUCATION & OPEN TO THE PUBLIC LECTURES

1. O. BUGNON, J. BERGER, S. THALMANN-MEJDI. Atelier « Acquisitions thérapeutiques 2015 », Programme de formation continue PMU pour médecins « Jeudis de la PMU », Lausanne, Switzerland, January 14, 2016
2. J. BERGER, O. BUGNON, D. HUGENTOBLER. « Médicaments : Nouveautés 2015 », Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, January 18, 2016
3. J. BERGER. « Le patient sous traitement oncologique à l'officine », Formation continue pour pharmaciens - SISPha, Grand-Saconnex, Switzerland, January 19, 2016
4. M. P. SCHNEIDER. « Activités de pharmacie clinique efficaces dans le VIH », CAS-DIU de Pharmacie Clinique, Grenoble, France, January 25, 2016
5. O. BUGNON. « Quoi de neuf pour le suivi pharmaceutique des patients asthmatiques ou BPCO ? », Programme EPGL/PharmaGenève de formation continue pour pharmaciens, Genève, January 26, 2016.
6. R. AUER, M. P. SCHNEIDER. « Transfert de connaissances », CAS de Recherche Clinique, Lausanne, Switzerland, January 29, 2016
7. S. CENGELLI, J. OMBELLI, M. P. SCHNEIDER. « Adhésion thérapeutique du patient chronique: un facteur important à promouvoir », Colloque Cercle de Qualité de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, February 3, 2016
8. M. P. SCHNEIDER, J. OMBELLI. « Adhésion médicamenteuse ». Cercle de qualité PMU, Lausanne, Switzerland, February 3, 2016
9. J. BERGER. « L'utilisation des « serious games » dans la formation des (futurs) pharmaciens », Colloque de la Pharmacie des HUG, Genève, Switzerland, February 16, 2016

10. J. SAVARY, S. SASLAWSKI, D. HUGENTOBLER. « Médicament sur le marché suisse: comment ça marche? », Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, February 29, 2016
11. J. BERGER. « Quand médicaments et alimentation ne font pas bon ménage », Formation continue interprofessionnelle - Symposium EMS, Lausanne, Switzerland, March 3, 2016
12. N. BAWAB, C. PERRAUDIN, J. TRAN, C. ROSSIER, O. BUGNON. « SISCare-DT2 : formation initiale pour le lancement du programme interprofessionnel et l'évaluation scientifique. », Vevey, march 3, 2016 – Neuchâtel, march 11, 2016 and Geneva, march 16, 2016.
13. J. BERGER, A. BOURDIN. « Sclérose en plaque : options thérapeutiques et accompagnement des patients en officine ». Formation continue pour pharmacien, Société Valaisanne de Pharmacie, Sion, Switzerland, March 8, 2016
14. O. BUGNON, A. NIQUILLE, C. ROSSIER. « Bonnes pratiques de prescriptions des antihypertenseurs (IT 02.03, 02.06, 02.07, 05.01) », Cercle de Qualité médecins-pharmaciens de Lausanne-1, Paudex, march 9, 2016.
15. Y. DUBOIS, S. THALMANN-MEJDI, J. BERGER. « Présentation du rapport d'assistance pharmaceutique 2015 des EMS CLAIR-SOLEIL et RECORDON », Cercle de qualité interprofessionnel en EMS, Ecublens (VD), Switzerland, March 15, 2016
16. J. BERGER. « Traitements oncologiques oraux », Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, March 21, 2016
17. J. BERGER, E. RESENTERRA. « Circuit médicamenteux des vaccins », Formation continues pour infirmiers, Cully, Switzerland, April 7, 2016
18. L. PERRIARD, J. BERGER, D. HUGENTOBLER. « Constipation – Nouveautés », Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, April 18, 2016
19. S. THALMANN MEJDI, M. WÜST, A. NIQUILLE, J. BERGER. « La validation d'ordonnances de médicaments à risque d'allongement de l'intervalle QT en pratique officinale », Formation continue pour pharmaciens - CAP, Lausanne, Switzerland, April 18, 2016
20. J. BERGER. « Interactions médicamenteuses : comment les gérer pratiquement de manière efficace !? », Formation continue pour pharmaciens - CAP, Lausanne, Switzerland, April 21, 2016
21. M. J. BARBALAT, C. LEUTHOLD. « Carnets de vaccination », Formation continue pour pharmaciens – Société cantonale vaudoise, Paudex, Switzerland, May 2, 2016
22. V. PAVÓN CLÉMENT, C. LEUTHOLD. « Carnets de vaccination », Formation continue pour pharmaciens – Société cantonale vaudoise, Paudex, Switzerland, May 3, 2016
23. M. P. SCHNEIDER, N. GENRE. « Nouveaux traitements de l'hépatite C : cas pratiques de validation d'ordonnance », Formation continue pour pharmaciens - PharmActuel, Lausanne, Switzerland, May 10, 2016
24. S. MEJDI, D. HUGENTOBLER, R. GAUTHIER, M. SCHUETZ, J. BERGER. « Décompensation et péjoration des maladies chroniques », Formation continue pour pharmaciens - CAP, Lausanne, Switzerland, May 11, 2016
25. O. BUGNON. « Quoi de neuf pour le suivi pharmaceutique des patients asthmatiques ou BPCO? », Formation continue pour pharmaciens - Société cantonale de Fribourg, Fribourg, Switzerland, May 12, 2016
26. J. BERGER, O. BUGNON, A. NIQUILLE. « Déprescription médicamenteuse », Formation continue pour pharmaciens - Ordre neuchâtelois pharmaciens, Neuchâtel, Switzerland, May 19, 2016
27. M. J. BARBALAT, V. PAVÓN CLÉMENT. « Cours Vaccination », Formation continue pour pharmaciens – Emergency Training Center, Fribourg, Switzerland, May 19, 2016
28. J. BERGER, A. BOURDIN. « Nouveautés Sclérose en plaque : Aubagio®, Tecfidera®, Plegridy® », Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, May 23, 2106

29. J. BERGER. « Co-traitements des patients sous traitements anticancéreux », Formation continue pour pharmaciens- PharmaGenève, Genève, Switzerland, May 24, 2016
30. J. BERGER, D. HUGENTOBLE. « Chaque personne est unique, ses médicaments aussi - La Pharmacie de la PMU, l'expertise accessible à tous », Colloque Cercle de Qualité de la Consultation de Médecine Générale de la PMU, Lausanne, Switzerland, June 1<sup>st</sup>, 2016
31. S. THALMANN-MEJDI. « Traitement des plaies : cas pratiques rencontrés », Formation continue pour pharmaciens - PharmActuel, Lausanne, Switzerland, June 7, 2016
32. O. BUGNON. « Bonnes pratiques de prescriptions en pneumologie », Cercle de Qualité médecins-pharmaciens d'Echallens, Echallens, June 9, 2016.
33. Y. DUBOIS, S. THALMANN-MEJDI, J. BERGER. « Classe des antiasthmatiques et nouveautés dans le traitement de la BPCO » Cercle de qualité interprofessionnel en EMS, Ecublens (VD), Switzerland, June 14, 2016
34. O. BUGNON. « Présent et futur de la Pharmacie communautaire en Suisse », Visite de la Faculté de Pharmacie de l'Université de Bourgogne, PMU, Lausanne, June 15, 2016.
35. E. OBERSON, J. BERGER, D. HUGENTOBLE. « Nouveaux ACO – Lixiana® » Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, June 20, 2016
36. J. BERGER. « Les antibiotiques en pratique ». Formation continues pour médecins-dentistes CMDO, PMU, Lausanne, Switzerland, June 22, 2016
37. J. BERGER. « Continuité des soins : Pharmacie ambulatoire et collaboration avec l'hôpital ». Certificate of Advanced Study en pharmacie clinique, Genève, Switzerland, June 23, 2016
38. Y. DUBOIS, S. THALMANN-MEJDI, J. BERGER. « Prescriptions des IPP et des analgésiques palier 1 ». Cercle de qualité interprofessionnel en EMS, Ecublens (VD), Switzerland, September 6, 2016
39. C. PELLATON, D. HUGENTOBLE, J. BERGER. « Insuffisance cardiaque – Entresto® ». Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, September 12, 2016
40. J. BERGER. « Les antibiotiques en pratique ». Formation continues pour dentistes ITI, Lausanne, Switzerland, September 12, 2016
41. J. BERGER, A. BOURDIN. « Sclérose en plaque : options thérapeutiques et accompagnement des patients en officine ». Société cantonale de Fribourg, Fribourg, Switzerland, September 20, 2016
42. J. BERGER. « Interactions médicamenteuses : comment les gérer pratiquement de manière efficace !? ». Formation continue pour pharmaciens - CAP, Cully, Switzerland, September 22, 2016
43. O. BUGNON. « Bilan 2014-2015 du groupe de cercles Vaud-1 et bonnes pratiques de prescription des antihypertenseurs (en particulier les classes thérapeutiques IT 02.03, 02.06, 02.07 et 05.01) », Cercle de qualité médecins-pharmaciens d'Echallens, Echallens, September 22, 2016.
44. A. NIQUILLE, C. ROSSIER, O. BUGNON. « Bilan 2014-2015 du groupe de cercles Vaud-1 et analyses détaillées des médicaments chers », Cercle de qualité médecins-pharmaciens de Lausanne-1, Paudex, September 28, 2016.
45. O. BUGNON. « Rémunération des prestations pharmaceutiques et ambulatoires », Module « Financement de la santé, médico-économie et flux du médicament », MAS en Pharmacie hospitalière, CHUV, Lausanne, September 28, 2016.
46. Y. DUBOIS, J. BERGER, V. SANTSCHI. « Pharmacie de ménage: quel choix? - Bon usage des médicaments à domicile ». Colloques de prévention et de promotion de la santé 2016, Lausanne, Switzerland, October 3, 2016
47. S. THALMANN-MEJDI. « Système Cardiovasculaire : cas pratiques de validation d'ordonnance ». Formation continue pour pharmaciens - PharmActuel, Lausanne, Switzerland, October 11, 2016
48. S. DU PASQUIER, J.-B. DAEPPEN, S. ACHAB. « Les addictions : Consommations problématiques d'alcool et Cyberaddiction ». Formation continue pour pharmaciens – CAP, Morges, Switzerland, October 11, 2016



49. [S. THALMANN-MEJDI, J. BERGER, D. HUGENTOBLER. « Incontinence urinaire ». Formation continue pour pharmaciens- PharmaGenève, Genève, Switzerland, October 18, 2016](#)
50. [Y. DUBOIS, D. HUGENTOBLER, J. BERGER. « Intolérances et allergies aux excipients ». Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, October 24, 2016](#)
51. [O. BUGNON. « Présentation des études en Pharmacie à l'Ecole de Pharmacie Genève-Lausanne : 1. Généralités ; 2. La 2e année du Master en Pharmacie ; 3. Objectifs et méthodes d'enseignement durant la 2e année de Master en Pharmacie ; 4. Formations universitaires post-diplôme ; 5. Examen fédéral de Pharmacie », Cours préparatoire pour les maîtres d'assistantat ; organisateur : pharmaSuisse ; Lausanne, October 31, 2016.](#)
52. [O. BUGNON, J. BERGER, A. NIQUILLE. Atelier « Peut-on déprescrire en EMS ? », Programme de formation continue PMU pour médecins « Jeudi de la PMU », PMU, Lausanne, Switzerland, November 5, 2016](#)
53. [J. BERGER. « Où trouver des informations en lien avec les médicaments ? : cas pratiques rencontrés ». Formation continue pour pharmaciens - PharmActuel, Lausanne, Switzerland, November 8, 2016](#)
54. [J. SAVARY, S. SASLAWSKI, S. MAYOR, D. HUGENTOBLER, T. MORAGA. « Assurance maladie, médicaments : comment ça marche en Suisse? ». colloque du Service d'Infectiologie - Med2, CHUV, Lausanne, Switzerland, November 15, 2016](#)
55. [A. NIQUILLE, C. ROSSIER, O. BUGNON. « Bonnes pratiques de prescription en pneumologie \(asthme et BPCO\) », Cercle de Qualité médecins-pharmaciens pour la prescription ambulatoire, Lausanne1, Paudex, Switzerland, November 16, 2016](#)
56. [O. BUGNON. « Bonnes pratiques de prescription des antibiotiques \(IT 08.01\) », Cercle de qualité médecins-pharmaciens d'Echallens, Echallens, November 17, 2016.](#)
57. [E. OBERSON, J. BERGER, D. HUGENTOBLER. « Hypolipémiants – nouveautés», Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, November 21, 2016](#)
58. [D. CATEAU, A. NIQUILLE, O. BUGNON. « Présentation des résultats 2014-2015 et des développements du programme d'assistance pharmaceutique des EMS fribourgeois », Société des pharmaciens du canton de Fribourg, Fribourg, November 21, 2016.](#)
59. [J. BERGER, A. BOURDIN. « Sclérose en plaque : options thérapeutiques et accompagnement des patients en officine ». Formation continue pour pharmaciens - Ordre neuchâtelois pharmaciens, Neuchâtel, Switzerland, November 22, 2016](#)
60. [J. BERGER, D. HUGENTOBLER. « Chaque personne est unique, ses médicaments aussi - La Pharmacie de la PMU, l'expertise accessible à tous ». Colloque Cercle de Qualité de la Consultation de Médecine Générale de la PMU, Lausanne, Switzerland, November 23, 2016](#)
61. [Y. DUBOIS, J. BERGER. « Comment constituer sa pharmacie de ménage ? ». Planète Santé 2016, Ecublens, Switzerland, November 24 2016](#)
62. [C. BIENVENU, O. BUGNON. « ePatient et ePharmacie : comment le web modifie les relations ? », Programme de formation continue de la Société vaudoise de Pharmacie et de l'Ecole de Pharmacie Genève-Lausanne, Lausanne, November 24, 2016.](#)
63. [D. CATEAU, O. BUGNON. « Présentation des résultats 2014-2015 et de l'avancement du projet des cercles de qualité dans les EMS vaudois », Formation continue de la Société vaudoise de Pharmacie. Lausanne, November 29, 2016.](#)
64. [J. BERGER. « Le patient sous traitement oncologique à l'officine - Partie 2». Formation continue pour pharmaciens - CAP, Cully, Switzerland, December 6, 2016](#)
65. [J. AUBERT, O. BUGNON. Less is more en pratique clinique – Atelier « Polypharmacie et déprescription en médecine ambulatoire », Programme de formation continue Jeudi de la PMU, Lausanne, December 5, 2016.](#)
66. [C. PELLATON, D. HUGENTOBLER, J. BERGER, « Antidote des nouveaux anticoagulants oraux – Praxbind®» Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, December 12, 2016](#)



67. Y. DUBOIS, S. THALMANN-MEJDI, J. BERGER. « Traitements de l'ostéoporose ». Cercle de qualité interprofessionnel en EMS, Ecublens (VD), Switzerland, December 13, 2016
68. O. BUGNON, E. OBERSON, L. PERRIARD, C. PELLATON, D. HUGENTOBLE, J. BERGER. « *Nouveautés 2016 en matière de pharmacothérapie et de pharmacovigilance* », Programme de formation continue pharmActuel, Lausanne, December 13, 2016.
69. M.P. SCHNEIDER, T. RUPPAR, C. FORTINI, J. PORTER, J. FOSTER, S. LAUZIER, R. VANDER STICHELE, B. GRANGER, H. BOSWORTH, J. LISKA, S. DE GEEST. « Interprofessional course in optimizing patient's adherence to medication », 8-hour workshop in Lisbon, Portugal & 4x1h30 of webinar course, 2016-2017

## THESIS PRESENTED

### INTRA-MUROS THESIS

ANTHONY GROGNOZ

*"Human fetal progenitor tenocytes for the treatment of tendon afflictions"*

Thesis Nr : 4886, University of Geneva, January 14, 2016

Directors : L. A. Applegate, O. BUGNON

### THESIS JURY

JEAN-DIDIER BARDET

*"Les pratiques pharmaceutiques collaboratives en soins de premier recours dans le contexte de l'émergence des technologies de l'information et de la communication"*

Faculty of pharmacy of Grenoble, July 4, 2016

Thesis Jury : O. BOURDON, O. BUGNON, N. PELLETIER-FLEURY, R. VARIN, P. BEDOUCH, B. ALLENET

MARKUS MESSERLI

*"Clinical pharmacy services and evaluation of medicines use: the case of the Swiss polymedication check"*

Faculty of Science, University of Basel, June 30, 2016

Thesis jury : K. HERSBERGER, O. BUGNON

MARTA SABATER GALINDO

*"Pharmacist-patient interaction in community pharmacy using the delivery of Medication Review with follow-up"*

University of Granada, Spain, December 2, 2016

Thesis jury : O. BUGNON

## RADIO TELEVISION INTERVENTION

D. HUGENTOBLE HAMPAÏ

RTS, CQFD, May 16, 2016

Le comment du pourquoi: médicament modifié

D. HUGENTOBLE HAMPAÏ

RTS, CQFD, June 13, 2016

Le comment du pourquoi: médicaments à la pièce

D. HUGENTOBLE HAMPAÏ

RTS, CQFD, June 22, 2016

Le comment du pourquoi: millepertuis et médicaments

D. HUGENTOBLE HAMPAÏ

RTS, CQFD, June 28, 2016

Le comment du pourquoi: aliments et médicaments

M.P. SCHNEIDER, J. CELIO  
RTS, CQFD, September 13, 2016  
Gros plan sur l'adhésion thérapeutique

<http://www.rts.ch/audio/la-1ere/programmes/cqfd/7977027-gros-plan-sur-l-adhesion-therapeutique-13-09-2016.html>

# HOSPITAL PHARMACY (CHUV)



## PROFESSOR FARSHID SADEGHIPOUR

### GENERAL DESCRIPTION OF THE UNIT

The CHUV hospital pharmacy group works in close collaboration with the HUG pharmacy and other hospital pharmacies to develop research and education activities in hospital and clinical pharmacy. The undergraduate education is mainly focused on a full course (32 h) of hospital pharmacy dispensed during the 3rd year of the baccalaurean cursus. A post-graduate education (MAS) in hospital pharmacy is also proposed since 1999 on the HUG and CHUV sites, in collaboration with the Valais hospital. This three years program is a complete specialization in hospital pharmacy, associating theoretical and practical teachings, as well as a one year research project. CHUV pharmacy also proposes positions for PhD students in pharmaceutical sciences, either for pharmacists having achieved their MAS, or in direct access. The topics are diversified among the research fields described below. For more information: CHUV pharmacy: <http://www.chuv.ch/pha>

### SPECIFIC RESEARCH FIELDS

#### Drug risk management

- Prospective risk analysis in hospital processes (FMECA method)
- Impact of information technologies on patient safety at prescription, dispensing and administration of drugs
- Impact of human factors on error rates at different steps of the medication use process.

#### Optimization of clinical use of drugs

- Securing and optimizing the drug use process by developing a clinical pharmacy activity
- Evaluation and improvement of specific administration techniques (i.e. enteral feeding tubes, nebulisation, intrathecal).
- Continuity of care at hospital discharge Detection, prevention, management and evaluation of drug incompatibilities

#### Development of hospital pharmaceutical forms

- Development of ready-to-use formulations adapted to hospital specificities, and validation of production processes.
- Formulation of pediatric parenteral nutrition

#### Pharmaceutical analysis

- Development and validation of generic separation methods for the dosage of active ingredients contained in hospital pharmaceutical formulations. Pharmacoeconomics and pharmacoepidemiology

### 2016 AT A GLANCE

Publications with impact factor	4
Posters presentations	10
Congresses & Symposia	2
Awards	1

## STAFF

### PRIVAT DOCENT

Pierre VOIROL

### RESEARCH AND TEACHING ASSISTANTS

Isabelle ANGELSTORF  
Christel BRUGGMANN  
Anne FOURNIER-HENRY

David PALMERO  
Hanitra RAVELOJAONA

### ADMINISTRATIVE STAFF

Dominique HUNZIKER

## PUBLICATIONS

### THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

Pharmacoeconomics	2.86
Eur. J. Clin. Pharmacol.	2.74
Ann. Pharmacother.	2.57
Pharmacotherapy	2.31
Qual. Saf. Health Care	2.16
J.Pharm. Pharmacol.	2.03
Am. J. Health-Syst. Pharm.	1.98
Swiss Med.Wkly	1.82
Int. J. Qual. Health Care	1.79
Int. J. Clin. Pharm. (IJCP)	0.86

### SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)

1. A. FOURNIER, P. VOIROL, M. KRÄHENBÜHL, C. L. BONNEMAIN, C. FOURNIER, E. DUPUIS-LOZERON, O. PANTET, J. L. PAGANI, J. P. REVELLY, F. SADEGHIPOUR, P. EGGIMANN, Y. QUE. Staphylococcus aureus carriage at admission predicts early-onset pneumonia after burn trauma. Eur J Clin Microbiol Infect Dis. 2017 Mar;36(3):523-528. 2.72
2. J. C. DEVAUD, M. M. BERGER, A. PANNATIER, F. SADEGHIPOUR, P. VOIROL. Does the type of parenteral lipids matter? A clinical hint in critical illness. Clin Nutr. 2017 Apr;36(2):491-496. 4.54
3. A. FOURNIER, P. VOIROL, M. KRÄHENBÜHL, C. L. BONNEMAIN, C. FOURNIER, O. PANTET, J. L. PAGANI, J. P. REVELLY, E. DUPUIS-LOZERON, F. SADEGHIPOUR, A. PANNATIER, P. EGGIMANN, Y. QUE. Antibiotic consumption to detect epidemics of Pseudomonas aeruginosa in a burn centre: A paradigm shift in the epidemiological surveillance of Pseudomonas aeruginosa nosocomial infections. Burns. 2016 May;42(3):564-70. 2.05
4. L. CARREZ, L. BOUCHOUD, S. FLEURY-SOUVERAIN, C. COMBESCURE, L. FALASCHI, F. SADEGHIPOUR, P. BONNABRY. Reliability of chemotherapy preparation processes: Evaluating independent double-checking and computer-assisted gravimetric control. J Oncol Pharm Pract. 2017 Mar;23(2):83-92. 1.73

## PRESENTATIONS

### POSTERS PRESENTATIONS

1. J.-C. DEVAUD, J. RIEGER, C. LEBLAND, G. PODILSKY, F. SADEGHIPOUR ; Automatisation de la fabrication des TPN par interface Baxa 2400 EM® et Excel® ; JFSPH ; Bern ; 2016
2. I. VICTOROVA, I. ANGELSTORF, A. PANNATIER, F. SADEGHIPOUR, Devenir des études cliniques réalisées au CHUV : Cibles prévues et résultats atteints ; JFSPH ; Bern ; 2016

3. I. ANGELSTORF, L. BOUCHOUD, F. SADEGHIPOUR ; Quel est l'attitude des néonatalogues et pharmaciens suisses à l'égard de la nutrition parentérale standardisée pour des enfants prématurés ? JFSPH ; Bern ; 2016
4. C. VAN DE VELDE, M. L. MOTTIER, N. PERROTTET RIES, R. HERVÉ, F. SADEGHIPOUR ; Ecraser les formes orales solides sans effort, sans contamination croisée et sans exposition des soignants : un Graal enfin à portée de main? JFSPH ; Bern ; 2016
5. C. BRÖNNIMANN, M. BERGER-GRYLLAKI, G. PODILSKY, F. SADEGHIPOUR ; Optimisation du processus de préparation des solutions de melphalan destinées à l'administration intra-vitréenne dans le traitement de rétinoblastomes et étude de leur stabilité ; JFSPH ; Bern ; 2016
6. A. FOURNIER, P. VOIROL, J. M. KRÄHENBÜHL, C. L. BONNEMAIN, C. FOURNIER, E. DUPUIS-LOZERON, O. PANTET, J. L. PAGANI, J. P. REVELLY, P. EGGIMANN, YA QUE, F. SADEGHIPOUR ; Staphylococcus aureus carriage at admission predicts early-onset pneumonia after burn trauma ; JFSPH ; Bern ; 2016
7. A. FEKA, J.C. DEVAUD, F. SADEGHIPOUR ; Rôle de l'APUS dans l'optimisation des retours de médicaments à la pharmacie ; JFSPH ; Bern ; 2016
8. M. L. MOTTIER, M. SOMMER, F. SADEGHIPOUR, Qualification d'un système informatisé de monitoring des températures (SIMT) pour sécuriser la gestion des médicaments thermosensibles, Congrès Hopipharm, Clermont-Ferrand, France, 2016
9. M. L. MOTTIER, F. SADEGHIPOUR, Mesurer la performance du management d'une équipe pharmaceutique: pertinence de la création d'un score à partir d'une enquête de satisfaction interne ; Congrès Hopipharm, Clermont-Ferrand, France, 2016 (1er Prix Posters)
10. I. ANGELSTORF, M. GRYLLAKI-BERGER, D. PALMERO, C. FISCHER-FUMEAUX, F. SADEGHIPOUR; Evaluation of the quality of the parenteral nutrition prepared at the neonatal unit; Congrès EAHP, Vienne, Autriche, 2016

## CONGRESSES & SYMPOSIA

1. Comment les hôpitaux francophones font face à la déferlante des produits innovants très couteux, cadre de la Suisse, Hopipharm, Clermont-Ferrand, France, 2016
2. B. TESTA, Seminar, Dept of Clinical Pharmacology, Lausanne University Hospital, 13.10.2016.

## CONTINUING EDUCATION & OPEN TO THE PUBLIC LECTURES

1. F. SADEGHIPOUR, G. PODILSKY, L. BOUCHOUD, P. BONNABRY, "Maîtrise de la fabrication en milieu aseptique". Pharmacies des HUG et du CHUV, Geneva, 2016
2. F. SADEGHIPOUR; BPF pour les préparations radiopharmaceutiques; Cours agréés par l'OFSP pour techniciens, CHUV, Lausanne, October 2016
3. P. VOIROL; CAS de pharmacie clinique, Module 4 Organisation
4. P. VOIROL; CAS de pharmacie clinique, Spécificités de la pharmacothérapie en soins intensifs ; Geneva, March 2016
5. P. VOIROL; CAS de pharmacie clinique, Support nutritionnel et prophylaxie de l'ulcère de stress en soins intensifs ; Geneva, March 2016
6. P. VOIROL; CAS de pharmacie clinique, Futilités des traitements, recherche clinique et compassionate use : quelle place en fin de vie ; Geneva, March 2016
7. P. VOIROL; Formation en pharmacie clinique : aujourd'hui et demain, en Suisse, Séminaire MAS «Assistance pharmaceutique et pharmacie clinique», HUG, Geneva, June 2016
8. P. VOIROL; Cours Société Suisse de Nutrition Clinique, CHUV, Lausanne, September 2016

## **AWARDS & DISTINCTIONS**

Prix du meilleur poster Congrès Hopipharm 2016 ; M. L. MOTTIER, F. SADEGHIPOUR, Mesurer la performance du management d'une équipe pharmaceutique : pertinence de la création d'un score à partir d'une enquête de satisfaction interne ; Congrès Hopipharm, Clermont-Ferrand, France, 2016

# HOSPITAL PHARMACY (HUG)



## PROFESSOR PASCAL BONNABRY

### GENERAL DESCRIPTION OF THE UNIT

The HUG hospital pharmacy group works in close collaboration with the CHUV pharmacy and other hospital pharmacies to develop research and education activities in hospital and clinical pharmacy. The undergraduate education is mainly focused on a full course (32 h) of hospital pharmacy dispensed during the 3rd year of the baccalaurean cursus. A post-graduate education (MAS) in hospital pharmacy is also proposed since 1999 on the HUG and CHUV sites, with a collaboration with the Valais hospital. This three years programme is a complete specialization in hospital pharmacy, associating theoretical and practical teachings, as well as a research project. HUG pharmacy also proposes positions for PhD students in pharmaceutical sciences, either for pharmacists having achieved their MAS, or in direct access. The topics are diversified among the research fields described below. For more information: HUG pharmacy: <http://pharmacie.hug-ge.ch>

### SPECIFIC RESEARCH FIELDS

#### Drug risk management

- Prospective risk analysis in hospital processes (FMECA method)
- Use of simulation to analyze factors that may influence the rate of preparation and administration errors
- Interests and risks of information technologies in risk management at the hospital.

#### Optimization of clinical use of drugs

- Securing the drug use process in high risk care units
- Detection, prevention, management and evaluation of drug incompatibilities
- Development of decision support, by a clinical pharmacy activity or the dematerialization in computerized systems
- Continuity of care at hospital discharge

#### Development of hospital pharmaceutical forms

- Validation of production processes
- Development of ready-to-use pharmaceutical forms
- Formulation of pediatric parenteral nutritions

#### Pharmaceutical analysis

- Development and validation of generic separation methods for the dosage of active ingredients contained in hospital pharmaceutical formulations.
- Analysis of cytotoxic drugs (quality control and traces in the environment)
- Analysis of monoclonal antibodies

#### Pharmacoeconomics and pharmacoepidemiology

- Analysis of drug use by means of time series methodology
- Modeling the use of antibiotics in relation with the evolution of resistance
- Evaluation of the spill-over effect between the hospital and the community settings



## 2016 AT A GLANCE

Publications with impact factor	6
Publications without impact factor	3
Posters presentations	14
Congresses & Symposia	17
Projects with industries	3
Ph.D. Thesis presented in 2016	2
Awards	1

## STAFF

### RESEARCH AND TEACHING ASSISTANTS

Clare BECHET

Mapi FLEURY

Anne-Laure BLANC

Olivia FRANCOIS

Laurent CARREZ

Nicolas GUICHARD

### INTERNSHIP STUDENTS – CO-SUPERVISION (CO-TUTELLE)

Anne FOURNIER-HENRY

Hanitra RAVELOJAONA

David PALMERO

### ADMINISTRATIVE STAFF

Dominique HUNZIKER

## RESEARCH FUNDS

### INDUSTRY AND ASSIMILATED

Code	Service - Development - Research	Total Amount for 2016 (CHF)
Pharm-ED	e-learning en pharmacie Hospitalière pour les pays en développement	85'000
	Impact des technologies de l'information sur la sécurité du circuit du médicament	45'000
	<b>total</b>	<b>130'000</b>

## PUBLICATIONS

### THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

Plos One	3.10
Pharmacoeconomics	2.86
Eur. J. Clin. Pharmacol.	2.74
Ann. Pharmacother.	2.57
Qual. Saf. Health Care	2.16
Am. J. Health-Syst. Pharm.	1.98
Swiss Med.Wkly	1.82
Int. J. Qual. Health Care	1.79
Int. J. Clin. Pharm. (IJCP)	0.86
Eur J Hosp Pharm	0.43

## SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)

1. H. M. SEIDLING, M. STÜTZLE, T. HOPPE-TICHY, B. ALLENET, P. BEDOUCH, P. BONNABRY, J. J. COLEMAN, F. FERNANDEZ-LLIMOS, C. LOVIS, M. J. REI, D. STÖRZINGER, L. A. TAYLOR, S. K. PONTEFRAC, P.-M. VAN DEN BEMT, H. VAN DER SIJS, W. E. HAEFELI. Best practice strategies to safeguard drug prescribing and drug administration : an anthology of expert views and opinions. *International Journal of Clinical Pharmacy* 2016;38:362-73 1.30
2. L.-Z. KAESTLI, S. NOBLE, CH. COMBESCURE, L. LACROIX, A. GALETTO, A. GERVAIX, C. FONZO-CHRISTE, P. BONNABRY. Drug information leaflets improve parental knowledge of their child's treatment at paediatric emergency department discharge. *European Journal of Hospital Pharmacy* 2016;23:151-5 4.43
3. N. SIMON, M. VASSEUR, M. PINTURAUD, M. SOICHOT, C. RICHEVAL, L. HUMBERT, M. LEBECQUE, O. SIDIKOU, C. BARTHÉLÉMY, P. BONNABRY, D. ALLORGE, B. DÉCAUDIN, P. ODOU. Effectiveness of a closed-system transfer device in reducing surface contamination in a new antineoplastic drug-compounding unit : a prospective, controlled, parallel Study. *Plos One* 2016;11:e0159052 3.10
4. M. FLEURY, C. FONZO-CHRISTE, C. NORMAND, P. BONNABRY. Confusion between two amphotericin B formulations leading to a paediatric rehospitalisation. *Drug Saf* 2016;3:4 3.20
5. A. DESNOYER, B. GUIGNARD, P.-O. LANG, J. DESMEULES, N. VOGT-FERRIER, P. BONNABRY P. Prescriptions médicamenteuses potentiellement inappropriées en gériatrie : quels outils utiliser pour les détecter ? *Presse Médicale* 2016;45:957-70 1.00
6. C. BÉCHET, R. PICHON, A. GIORDAN, P. BONNABRY. Hospital pharmacists seen through the eyes of physicians : qualitative semi-structured interviews. *International Journal of Clinical Pharmacy* 2016;38:1483-96 1.30

## SCIENTIFIC PUBLICATIONS (WITHOUT IMPACT FACTOR)

1. N. VERNAZ, V. ROLLASON, L. ADLERE, CH. COMBESCURE, A. PONCET, P. BONNABRY, J. DESMEULES. Snapshot of the prescribing practice for the clopidogrel and esomeprazole coprescription and cost evaluation of the application guidelines. *Pharmacology Research & Perspectives* 2016;4:e00234.
2. L. CERRUTI, D. LEBEL, T. VAN HEES, O. BOURDON, P. BONNABRY, A. SPINWINE, J. D. HECQ, J. F. BUSSIERES. Pilot study about hospital pharmacy residents' perception of pharmacovigilance In Belgium, France, Canada and Switzerland. *Journal of Population Therapeutics and Clinical Pharmacology* 2016;22:E179-88.
3. E. H. A. DIOP, J. SCHAPPLER, E. REGINATO, C. L. ROHRBASSER, P. BONNABRY, S. RUDAZ. Une solution fiable et peu coûteuse pour contrôler la qualité des médicaments dans les pays émergents. *PharmaJournal* 2016;24:6-7.

## PRESENTATIONS

### POSTERS PRESENTATIONS

1. L. GSCHWIND, N. YANKOVA, C. GUÉGUÉNIAT-DUPESSEY, C. FONZO-CHRISTE, P. BONNABRY. e-learning to reduce IV medication errors ? Simulation study in a "room of errors". 21<sup>st</sup> Congress of the European Association of Hospital Pharmacists EAHP, Wien, 2016.
2. L. CARREZ, L. BOUCHOUD, S. FLEURY, C. COMBESCURE, L. FALASCHI, P. BONNABRY. Impact of workload on preparations quality in chemotherapy : a pilot simulation study. 21<sup>st</sup> Congress of the European Association of Hospital Pharmacists EAHP, Wien, 2016.
3. S. VON GRÜNIGEN, P. BONNABRY. Pharm-Ed : a hospital pharmacy educational and collaborative platform for developing countries. Geneva Health Forum, Genève, 2016

4. J. SCHAPPLER, E. REGINATO, C. ROHRBASSER, P. BONNABRY, S. RUDAZ. Low-cost capillary electrophoresis for counterfeit detection and quality control of substandard drugs in emerging countries. Geneva Health Forum, Geneva, 2016
5. O. FRANÇOIS, M. AUSSE DAT, L. CARREZ, L. GSCHWIND, P. BONNABRY. Robotisation et scanning de la distribution globale des médicaments : impact sur le taux d'erreur et l'efficacité. Hopipharm, Clermont-Ferrand, 2016
6. C. BÉCHET, R. PICHON, P. BONNABRY, A. GIORDAN. "Qu'est-ce qu'un pharmacien hospitalier pour vous?" Une étude qualitative sur la perception du pharmacien par le médecin, en milieu hospitalier. Hopipharm, Clermont-Ferrand, 2016.
7. C. BÉCHET, R. PICHON, P. BONNABRY, A. GIORDAN. The hospital pharmacist seen through the eyes of physicians : Qualitative semi-structured Interviews. Symposium Clinical Pharmacy Switzerland, Bâle, 2016.
8. J. SCHAPPLER, E. A. DIOP, E. REGINATO, C. ROHRBASSER, P. BONNABRY, S. RUDAZ. Development of a low-cost analytical strategy for the detection of counterfeits and sub-standards medicines in emerging countries. Swiss Pharma Sciences Day, Bern, 2016 (poster primé).
9. A. L. BLANC, B. GUIGNARD, A. DESNOYER, O. GROSGURIN, C. MARTI, C. SAMER, P. BONNABRY. PIM-Check used by physicians to reduce drug-related problems in internal medicine. 20<sup>èmes</sup> Journées Franco-Suisse de Pharmacie Hospitalière, Berne, 2016.
10. M. JERMINI, L. CARREZ, V. MARTIN, L. BOUCHOUD, L. FALASCHI, P. BONNABRY. Application d'une méthodologie Lean Healthcare pour la production des chimiothérapies. 20<sup>èmes</sup> Journées Franco-Suisse de Pharmacie Hospitalière, Bern, 2016.
11. O. FRANÇOIS, L. MEDDEB, C. GUEGUENIAT-DUPESSEY, P. BONNABRY. Influence d'une armoire à pharmacie automatisée et des interruptions de tâches sur le taux d'erreur de dispensation des médicaments, étude de simulation. 20<sup>èmes</sup> Journées Franco-Suisse de Pharmacie Hospitalière, Berne, 2016 (poster primé).
12. O. FRANÇOIS, L. CINGRIA, C. SAVIN, S. DUMONT, C. VENTOSE, V. GUIGNON, E. MEIER, M. GIULETTI, M. JERMINI, C. STUCKI, P. BONNABRY. Armoires automatisées et gestion des pharmacies d'étage par des assistantes en pharmacie : évaluation par une analyse prospective des risques. 20<sup>èmes</sup> Journées Franco-Suisse de Pharmacie Hospitalière, Bern, 2016
13. H. OUALI, P. BONNABRY, N. WIDMER, C. BLATRIE. Analyse et amélioration de la sécurité de la préparation et de l'administration des chimiothérapies par une analyse prospective des risques. 20<sup>èmes</sup> Journées Franco-Suisse de Pharmacie Hospitalière, Bern, 2016.
14. P. THOMANN, L. BOUCHOUD, S. FLEURY, P. BONNABRY. Mélange de solutions en poches et en seringues : comment être homogène ? 20<sup>èmes</sup> Journées Franco-Suisse de Pharmacie Hospitalière, Berne, 2016.

## CONGRESSES & SYMPOSIA

1. P. BONNABRY. " Improved quality of medication management helps to reduce medication errors ", Carefusion, Singapore, 2016
2. T. SIGRIST. "Mythe et réalité du pansement alcoolisé ou que faire en cas d'extravasation de produits non cytotoxiques ?", Dispositifs intraveineux de longue durée (DIVDL), congrès francophone , Paris, 2016
3. C. FONZO-CHRISTE. " Incompatibilités médicamenteuses et nutrition parentérale en néonatalogie ", Journées nationales de néonatalogie (JNN), Paris, 2016
4. P. BONNABRY. "How improving the quality of medication management helps to reduce medication errors", EAHP Congress, Vienna, 2016
5. P. BONNABRY. " La simulation, ici et ailleurs... ", PEPC, Paris, 2016

6. P. BONNABRY. " Information technologies to improve the safety of drug management in hospitals ", Global GS1 Healthcare Conference, Dubai, 2016
7. P. BONNABRY. " Cytotoxic traceability and patient wristbands ", Global GS1 Healthcare Conference, Dubai, 2016
8. B. GUIGNARD. " Antibiotiques : interactions et adaptation de la dose sur la fonction rénale ", swissYPG Symposium, Berne, 2016
9. A. DESNOYER. " Développement d'un outil électronique de détection des prescriptions inappropriées chez l'adulte hospitalisé en médecine interne ", Hopipharm, Clermont-Ferrand, 2016
10. P. BONNABRY. " Seringues prêtes à l'emploi (CIVAS) ", Hopipharm, Clermont-Ferrand, 2016
11. A. L. BLANC. " PIM-Check©: a new electronic screening tool to detect and manage potentially inappropriate medications in general internal medicine ", 1ère Assemblée de printemps de la SSMIG, Bâle, 2016
12. A. DESNOYER. " Troubleshooting tools in medicines review - PIM-CHECK© training ", EAHP Academy Seminar, Bucarest, 2016
13. A. DESNOYER. " Clinical implementation of medication review - screening to supervise effectiveness and appropriateness ", EAHP Academy Seminar, Bucarest, 2016
14. P. BONNABRY, S. VON GRUENIGEN. " Safe handling of cytotoxic medicines in low and middle income countries : how to progress? ", GERPAC, Hyères, 2016
15. L. CARREZ. " Lean analysis of a production unit for chemotherapies ", GERPAC, Hyères, 2016
16. P. BONNABRY, S. FLEURY. " Control of the production environment: why and how ? ", Infusion technologies symposium, Lille, 2016
17. C. FONZO-CHRISTE. " Extravasation de nutrition parentérale ", Journées francophones de nutrition (JFN), Montpellier, 2016

## CONTINUING EDUCATION & OPEN TO THE PUBLIC LECTURES

1. P. BONNABRY "IT to optimize the medication process at the hospital", Berner Fachhochschule, Genève, 2016
2. P. BONNABRY "Analyse prospective des risques: application de la méthode AMDEC". CAS qualité des soins, Université de Genève, Genève, 2016
3. P. BONNABRY "Analyse prospective des risques: application de la méthode AMDEC". Master techniques pharmaceutiques hospitalière. Université de Lille, Lille, 2016
4. S. RUDAZ, P. BONNABRY "Contrefaçons médicamenteuses: le projet Pharmelp", Cycle de formation continue EPGL-PharmaGenève, Genève, 2016
5. P. BONNABRY "Stratégie de sécurisation du circuit du médicament : apport des technologies de l'information". Diplôme universitaire (DU) d'analyse et de gestion des risques en santé, Université René Descartes, Paris, 2016
6. P. BONNABRY, F. SADEGHIPOUR, et al. Maîtrise de la fabrication en milieu aseptique. Pharmacies des HUG et du CHUV, Genève, 2016
7. P. BONNABRY "Enjeux futurs et implication pour la pharmacie clinique". CAS en pharmacie clinique, Université de Genève, Université de Grenoble, Genève, 2016
8. L. BOUCHOUD "Le rôle de la pharmacie dans les essais cliniques". BPEC, Cours des HUG / Faculté de médecine, Hôpital des Enfants, Genève, 2016
9. P. BONNABRY "Analyse prospective des risques", DU de pharmacotechnie, Bordeaux, 2016
10. P. BONNABRY "Automatisation : arrières et facilitateurs", DU de pharmacotechnie, Bordeaux, 2016
11. P. BONNABRY "LEAN management", DU de pharmacotechnie, Bordeaux, 2016

12. P. BONNABRY "Innover pour plus de sécurité et d'efficacité dans l'utilisation des médicaments à l'hôpital", Cafés de l'innovation, HUG, Genève, 2016
13. P. BONNABRY "Traçabilité", Certificat d'assistante en pharmacie hospitalière, GPHR, Genève, 2016

## THESIS PRESENTED

### INTRA-MUROS THESIS

Olivia FRANCOIS

" Impact de l'automatisation et de la robotisation sur la sécurité et l'efficacité du circuit du médicament à l'hôpital ", Geneva, September 2016

Delphine CARLI

" Impact des aides à la décision informatisée sur la qualité des soins ",  
Thesis N° 4992 - Geneva, September 2016

## RADIO TELEVISION INTERVENTION

P. BONNABRY

RTS – A bon entendeur, 13 janvier 2016  
Dates de péremption des médicaments

P. BONNABRY

RTS – Couleur locales, 9 février 2016  
Un robot pour une chimio

P. BONNABRY

RTS – 19:30, 20 juin 2016  
Transparence dans les sommes versées par l'industrie pharmaceutique

P. BONNABRY

RTS – Forum, 17 septembre 2016  
Erreurs de médication

## AWARDS & DISTINCTIONS

P. BONNABRY

Nomination comme membre correspondant étranger de l'Académie Nationale de Pharmacie, Paris,  
2016

# MOLECULAR PHARMACOLOGY



## PROFESSEUR PATRYCJA NOWAK (SINCE 01.06.2016)

The overall aim of the Molecular Pharmacology Group's research is the discovery of vascular biology mechanisms and the development of optimized therapeutic strategies for the treatment of complex disease, mainly cancer.

The mainstays of the ongoing research are:

- design of personalized optimization of multidrug combinations,
- identification of novel targets for treatment,
- patient-derived 3D in vitro tumor models,
- cell death mechanisms,
- overcoming acquired resistance of targeted drugs,
- alternative to mammalian screening models,
- nano-systems for co-delivery of multidrug combinations.



We work in a close collaboration with clinicians, engineers, biologists and medical oncologists in order to perform clinically relevant translational research to improve cancer treatment efficacy, reduce side effects and probability of a drug acquired resistance. Our ultimate goal is to develop personalized synergistic combination therapies to the dynamically changing tumor response.

## 2016 AT A GLANCE

Publications with impact factor	10
Books and chapters	1
Posters presentations	1
Number of projects at FNRS and assimilated	1

## STAFF

### POSTDOCTORAL SCHOLARS

Andrea WEISS

### RESEARCH AND TEACHING ASSISTANTS

Marloes ZOETEMELK

### ADMINISTRATIVE STAFF

Danielle COOSEMANS

Dominique HUNZIKER

## RESEARCH FUNDS

### EUROPEAN RESEARCH COUNCIL EXECUTIVE AGENCY – OPTIM 680209

Optimized drug combinations for effective cancer treatment : a personalized approach

Requerent : P. NOWAK

Allocation totale : euro 1'199'436.—

Allocation 2016 : chf 505'440

Duration : 4 ans

Starting date : 1.6.2016

## PUBLICATIONS

### THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

International Journal of Cancer	5.08
Nature Protocols	9.67
MedChemComm	2.49
Biological Review	9.67
Mutation Research	5.49
Drug Resistance	9.12
Journal of biological Inorganic	2.53

### SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)

1. J. R. VAN BEIJNUM, V. L. THIJSEN, T. LÄPPCHEN, T. H. WONG, I. VEREL, M. ENGBERSEN, I. J. SCHULKENS, R. ROSSIN, H. GRÜLL, A. W. GRIFFIOEN, P. NOWAK-SLIWINSKA: "A key role for galectin-1 in sprouting angiogenesis revealed by novel rationally designed antibodies." *International Journal of Cancer*, 139(4) (2016) 824-35. 5.08
2. P. NOWAK-SLIWINSKA, X. DING, A. WEISS, P. J. DYSON, H. VAN DEN BERGH, A. W. GRIFFIOEN, C. M. HO: "The Feedback System Control technique, an ultra-efficient drug combination screening method, *Nature Protocols*, 11(2) (2016) 302-15. Invited paper. 9.67
3. P. NOWAK-SLIWINSKA, A. WEISS, E. PĂUNESCU, C. M. CLAVEL, A. W. GRIFFIOEN, P. J. DYSON: "Anti-angiogenic Properties of Chlorambucil Derivatives with Fluorous and Hydrocarbon Appendages", *MedChemComm*, 7 (2016) 1596 – 1603. 2.49
4. J. R. VAN BEIJNUM, W. PIETERS, P. NOWAK-SLIWINSKA, A. W. GRIFFIOEN: "Insulin-like growth factor axis targeting in cancer and tumor angiogenesis – the missing link", *Biological Reviews*, 67(2) (2016) 441-61. 9.67
5. A. WEISS, P. NOWAK-SLIWINSKA: "Current Trends in Multidrug Optimization", *Journal of Laboratory Automation*, (2016) Dec 1. doi: 10.1177/2472630316682338
6. M. KUCINSKA, P. NOWAK-SLIWINSKA, M. MURIAS: "Beyond mouse cancer models: three-dimensional human-relevant in vitro and non-mammalian in vivo models for photodynamic therapy", *Mutation Research – Reviews*. In press, 2016. 5.49
7. E. J. M. HUIJBERS, S. SABRKHANY, J. R. VAN BEIJNUM, V. J. THIJSEN, P. NOWAK-SLIWINSKA, A. W. GRIFFIOEN: "The tumor stromal microenvironment in resistance to anti-angiogenic therapy.", *Drug Resistance Updates*, 25 (2016) 26-37. 9.12
8. P. NOWAK-SLIWINSKA, A. W. GRIFFIOEN: "Therapeutic potential of angiogenesis inhibitor mixtures in cancer treatment" *Research and Clinical Medicine*, 1(1) (2016) 9-13. (Invited review).
9. D. STIBAL, B. THERRIEN, G. SÜSS-FINK, P. NOWAK-SLIWINSKA, P. J. DYSON, E. ČERMÁKOVÁ, M. ŘEZÁČOVÁ, P. TOMŠÍK: "Chlorambucil conjugates of dinuclear p-cymene ruthenium trithiolato complexes as dual target anticancer compounds", *Journal of Biological Inorganic Chemistry*, Apr 4 (2016). 2.53
10. A. W. GRIFFIOEN, E. J. M. HUIJBERS, P. NOWAK-SLIWINSKA: "Embryonic angiogenesis markers and diagnostic and therapeutic strategies based thereof." Patent EP16182827. Filed 4 August (2016).



## BOOKS CHAPTERS

1. H. VAN DEN BERGH H, P. NOWAK-SLIWINSKA : "On the use of photodynamic therapy in the treatment of polypoidalchoroidal vasculopathy: an update." in Handbook of Photodynamic Therapy : Updates on Recent Applications of Porphyrin-Based Compounds, R. Pandey, D. Kessel, T.J. Dougherty (Ed), world Scientific. Publishing Co Pte Ltd., Singapore, ISBN13 9789814719643, April (2016) (book chapter)

## PRESENTATIONS

### POSTERS PRESENTATIONS

1. I. STAWOSKA, W. TEJCHMAN, O. MAZURYK, A. LYCKA, P. NOWAK-SLIWINSKA, E. ŻESŁAWSKA, W. NITEK, A. KANIA: "Spectral characteristic and preliminary anticancer activity in vitro of selected rhodanine derivatives." 8th Seminar of Medical Chemistry, Lublin, Poland, September 15, 2016

### ORAL PRESENTATIONS

1. P. NOWAK-SLIWINSKA. "Phenotypic multi-drug optimization in cancer treatment: challenges and opportunities". - Biology Department, University of Geneva, November 7, 2016 (invited talk).
2. P. NOWAK-SLIWINSKA. "Personalized cancer therapy: where are we? " Molecular Therapeutics - Discovery, Development and Delivery, Zermatt, Switzerland, September 6, 2016 (invited talk).
3. P. NOWAK-SLIWINSKA. "Identification of optimal personalized combination therapy for renal cell cancer" - Gordon Research Conference on Personalized Medicine, Hong Kong, July 12, 2016 (invited talk)
4. P. NOWAK-SLIWINSKA. "Design of optimal combination therapy for the treatment of disease" - 38th Meeting of the American Society for Photobiology Meeting, Tampa, USA, May 25, 2016 (invited talk).

## AWARDS

Tony B. Academic Travel Award, SLAS2016, Washington DC, USA and add it to the summary table

# CLINICAL PHARMACOLOGY AND TOXICOLOGY



## PROFESSOR JULES DESMEULES

### GENERAL DESCRIPTION OF THE UNIT

Our research aims to study the genetic variation of drug responses by evaluating drug transportation and the enzymes involved in the metabolism of xenobiotics such as cytochromes P450 through *in vitro* (microsomes, cells) or *in vivo* models (phenotypisation, genotypisation, pharmacokinetic, toxicogenetic and pharmacogenetic clinical and epidemiological studies), and studies related to the safety usage of drugs. The other field developed by the clinical pharmacology and toxicology is directed to studies related to chronic pain and the usage and misuse of analgesics and palliative care.

### SPECIFIC RESEARCH FIELDS

Current research projects focus on:

- 1) measuring the impact of pharmacogenomics on drug response focusing mainly in opioids, antiplatelet, antiHIV drugs, oncologic treatments),
- 2) Developing tools to measure the activity of metabolic enzymes, predict therapeutic responses (phenotyping cocktails, PB-PK simulation) and detect drug-drug interactions,
- 3) Evaluating the role of genomics in the assessment of adverse drug reactions
- 4) Developing neurophysiological evaluation methods for testing the efficacy of peripheral and central analgesics (psychometric and neurophysiological-quantitative sensory testing evaluation), for the treatment of acute and chronic pain syndromes.
- 5) Promote synergies between basic sciences and clinical medicine. As such we are engaged in different projects such as Human genomic population structure and phenotype-genotype variation in ADME genes along a latitudinal transect from Africa to Europe in collaboration with the Department of Genetics and Evolution (Estella Polloni). Other collaborations are ongoing with Jean-Charles Sanchez' group (proteomics analysis of paracetamol hepatotoxicity), the Geneva Platelet group (pharmacogenetics of antithrombotics), Christian Lovis group (phenomic approaches and NLP to detect adverse drug reactions), Marc Ansari's group (busulfan dose individualization), and psychiatric group (Markus Kosel's group: prescription in adults with intellectual disabilities), Petros Tsantoulis (molecular tumor board) and Aurelien Thomas's group (metabolomic approaches), as well as pharmaceutical sciences groups (Serge Rudaz, Gérard Hopfgartner) and the Swiss Center for Applied Human Toxicology (Martin Wilks).

### 2016 AT A GLANCE

Publications with impact factor	22
Number of projects at FNRS and assimilated	5
PhD Thesis presented in 2016	1
Awards	4
Patents	2

## STAFF

### SENIOR LECTURERS

Marie BESSON  
Christine CEDRASCHI

Youssef DAALI  
Monica ESCHER

### SENIOR RESEARCH ASSOCIATE

Kuntheavy ING LORENZINI  
Val PIGUET  
Victoria ROLLASON GUMPRECHT

Caroline SAMER  
Nicole VOGT-FERRIER

### MASTER STUDENTS PHARMACY

Jonathan FARO  
Nour El Houda KARRAY

Armelle SOUKAL

## RESEARCH FUNDS

### SWISS NATIONAL SCIENCE FOUNDATION

Novel approaches to the treatment of chronic pain: translating recent discoveries in pain-related neural plasticity to clinical practice  
Applicant : A. Matthey  
co-applicant : M. BESSON, Y. DAALI  
total funding : CHF 1'800'000  
For Geneva : CHF 420'000

### SWISS NATIONAL SCIENCE FOUNDATION

FNRS 32003B\_156471/2015-2017 "In vitro and in vivo evaluation of drug-drug interactions between HIV antiretroviral therapies and antiplatelet P2Y12 inhibitors"  
Applicant : J. DESMEULES, Y. DAALI, P. FONTANA  
total funding : CHF 161'920.-

### SWISS NATIONAL SCIENCE FOUNDATION

FNRS 32003B\_140783 2013-2015 "Dexamethasone for the treatment of established postoperative nausea and vomiting. A randomised, placebo-controlled, dose-finding  
Applicants : M. TRAMER, C. KERN, J. DESMEULES  
total funding : CHF 358'609.-

### SWISS NATIONAL SCIENCE FOUNDATION

PNR 67 139304 2014-2017 "Non-medical factors that influence the decision to admit a seriously ill patient to intensive care"  
Applicants : M. ESCHER, P. DAYER, P. HUDELSON, M. NENDAZ, T. PERNEGER, B. RICOU  
Total funding CHF 233'271

### SWISS NATIONAL SCIENCE FOUNDATION

FNRS 320030\_159669 2015-2018 "Human genomic population structure and phenotype-genotype variation in ADME genes along a latitudinal transect from Africa to Europe"  
Applicants : E. POLONI, Y. DAALI, J. DESMEULES.  
Total funding : CHF 429'000.--

## PUBLICATIONS

### THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

Clinical Pharmacology and Therapeutics	6.28
Free Radical Biology and Medicine	5.60
J Allergy Clin Immunol Pract	5.42
Science of the Total Environment	4.90
Neuropharmacology	4.70
Pharmacol Res.	4.39
Front Pharmacol	4.26
Toxicology and Applied Pharmacology	3.79
Platelets	3.21
Curr Pharm Des	3.13

### SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)

1. K. ING LORENZINI, F. GAY-CROSIER CHABRY, V. PIGUET, J. DESMEULES. Meta-xylene : identification of a new antigenic entity in hypersensitivity reactions to local anesthetics. *J Allergy Clin Immunol Pract.* 2016;4:162-4. 5.42
2. M. BOSILKOVSKA, K. ING LORENZINI, C. R. UPPUGUNDURI, J. DESMEULES, Y. DAALI, M. ESCHER. Severe Vincristine-induced Neuropathic Pain in a CYP3A5 Nonexpressor with reduced CYP3A4/5 Activity:case study. *Clin Ther.*2016 Jan;38(1):216-20. 2.64
3. F. STORELLI, Y. DAALI, J. DESMEULES, J.L. RENY, P. FONTANA. Pharmacogenomics of Oral Antithrombotic Drugs. *Curr Pharm Des.* 2016;22:1933-49. 3.13
4. M. BOSILKOVSKA, C. SAMER, J. DEGLON, A. THOMAS, B. WALDER, J. DESMEULES, Y. DAALI. Evaluation of Mutual Drug-Drug Interaction with Geneva Cocktail for Cytochrome P450 henotyping using Innovative Dried Blood Sampling Method. *Basic Clin Pharmacol Toxicol.* 2016 Sep;119(3):284-90. 2.56
5. N. MARSOUSI, C. SAMER, P. FONTANA, J. L. RENY, S. RUDAZ, J. DESMEULES, Y. DAALI. Coadministration of ticagrelor and ritonavir:Toward prospective dose adjustment to maintain an optimal platelet inhibition using the PBPK approach. *Clin Pharmacol Ther.*2016;100:295-304. 6.28
6. C. LLORET-LINARES, V. ROLLASON, K. ING LORENZINI, C. SAMER, Y. DAALI, M. GEX-FABRY, J. M. AUBRY, J. DESMEULES, M. BESSON. Screening for genotypic and phenotypic variations in CYP450 activity in patients with therapeutic problems in a psychiatric setting, a retrospective study. *Pharmacol Res.*2016, 1. Epub ahead of print. 4.39
7. V. ROLLASON GUMPRECHT, L.F.J. SPAHR, M. ESCHER. Severe liver injury due to a homemade flower pollen preparation in a patient with high CYP3A enzyme activity: a case report. *European Journal of Clinical Pharmacology* 2016;72(4):507-508. 4.70
8. W. T. RALVENIUS, M. A. ACUNA, D. BENKE, A. MATTHEY, Y. DAALI, U. RUDOLPH, J. DESMEULES, H. U. ZEILHOFER, M. BESSON. The clobazam metabolite N-desmethyl clobazam is an  $\alpha 2$  preferring benzodiazepine with an improved therapeutic window for antihyperalgesia. *Neuropharmacology.*2016;109:366-75. 1.84
9. N. MARSOUSI, F. DOFFEY-LAZEYRAS, S. RUDAZ, J. DESMEULES, Y. DAALI. Intestinal permeability and P-glycoprotein-mediated efflux transport of ticagrelor in Caco-2 monolayer cells. *Fundam Clin Pharmacol.*2016;30:577-584. 1.84
10. N. VERNAZ, V. ROLLASON, L. ADLERE, C. COMBESCURE, A. PONCET, P. BONNABRY, J. DESMEULES. Snapshot of the prescribing practice for the clopidogrel and esomeprazole

- co-prescription and cost evaluation of the application guidelines. *Pharmacol Res Perspect.*2016 21;4:e00234.
11. [A. DESNOYER, B. GUIGNARD, P. O. LANG, J. DESMEULES, N. VOGT-FERRIER, P. BONNABRY.](#) Potentially inappropriate medications in geriatrics:which tools to detect them ? *Presse Med.*2016;45:957-970. 0.86
  12. [S. ROMAND, D. SPAGGIARI, N. MARSOUSI, C. SAMER, J. DESMEULES, Y. DAALI, S. RUDAZ.](#) Characterization of oxycodone in vitro metabolism by human cytochromes P450 and DP-glucuronosyltransferases. *J Pharm Biomed Anal.*2016 26. 2.90
  13. [F. CUSIN, L. FERNANDES AZEVEDO, P. BONNAVENTURE, J. DESMEULES, Y. DAALI, C. M. PASTOR.](#) Hepatocyte Concentrations of Indocyanine Green Reflect Transfer Rates across Membrane Transporters. *Basic Clin Pharmacol Toxicol.*2016 14. 2.56
  14. [K. ING LORENZINI, Y. DAALI, P. FONTANA, J. DESMEULES, C. SAMER.](#) Rivaroxaban-induced hemorrhage Associated with ABCB1 Genetic Defect. *Front Pharmacol.*2016 19;7:494. 4.26
  15. [D. SPAGGIARI, Y. DAALI, S. RUDAZ :](#) An extensive cocktail approach for rapid risk assessment of in vitro CYP450 direct reversible inhibition by xenobiotic exposure. *Toxicology and Applied Pharmacology* 2016, 302:41-51. 3.79
  16. [T. SEREDENINA, Z. NAYERNIA, S. SORCE, G. J. MAGHZAL, A. FILIPPOVA, S. C. LING, O. BASSET, O. PLASTRE, Y. DAALI, E.J. RUSHING, et al](#) Evaluation of NADPH oxidases as drug targets in a mouse model of familial amyotrophic lateral sclerosis. *Free Radical Biology and Medicine* 2016, 97:95-108. 5.60
  17. [S. DAOUK, N. CHÈVRE, N. VERNAZ, C. WIDMER, Y. DAALI, S. FLEURY-SOUVERAIN.](#) Dynamics of active pharmaceutical ingredients loads in a Swiss university hospital wastewaters and prediction of the related environmental risk for the aquatic ecosystems. *Science of the Total Environment* 2016, 547:244-253. 4.90
  18. [C. BRUN, Y. DAALI, C. COMBESCURE, A. ZUFFEREY, A. D. MICHELSON, P. FONTANA, J. L. RENY, A. L. FRELINGER.](#) Aspirin response: Differences in serum thromboxane B2 levels between clinical studies. *Platelets* 2016, 27:196-202. 3.21
  19. [A. E. ACOSTA-MARTIN, P. ANTINORI, C. R. S. UPPUGUNDURI, Y. DAALI, M. ANSARI, A. SCHERL, M. MÜLLER, P. LESCUYER.](#) Detection of busulfan adducts on proteins. *Rapid Communications in Mass Spectrometry* 2016, 30:2517-2528. 2.00
  20. [S. DAOUK, S. FLEURY-SOUVERAIN, Y. DAALI.](#) Development of an LC-MS/MS method for the assessment of selected active pharmaceuticals and metabolites in wastewaters of a swiss university hospital. *Chimia* 2015, 69:684-689.
  21. [A. FINCKH, M. ESCHER, M. H. LIANG, N. BANSBACK.](#) Preventive Treatments for Rheumatoid Arthritis: Issues Regarding Patient Preferences. *Curr Rheumatol Rep.* 2016 Aug;18(8):51.
  22. [L. CANEL, S. ZISIMOPOULOU, M. BESSON, M. NENDAZ.](#) Topiramate-induced severe heatstroke in an adult patient: a case report. *J Med Case Rep.* 2016;10(1):95(Impact Factor NA)

## THESIS PRESENTED

### INTRA-MUROS THESIS

Ameena JESAIMANI.

The use of internet for health information by hospitalized patients in Switzerland and Qatar

Thesis N° 4920 – University of Geneva – april 2016

Director : J.-L. VEUTHEY

Co-director : P. DAYER

## AWARDS & DISTINCTIONS

Prix de l'Innovation organisé par les HUG et l'Université de Genève : « use of N-desmethyloclobazam for neuropathic pain. »

Prix de la meilleure thèse de la Société Suisse de Pharmacologie Clinique (Marija Bosilkovska).

Prix de la meilleure publication dans le domaine de la simulation PBPK offert par SIMCYP; Certara Compagny, Sheffield, UK.

2<sup>e</sup> Prix OFAC Pharmacy Awards décerné à Amelle SOUKAL étudiante en pharmacie pour son travail de master Développement d'un enseignement concernant l'utilisation des outils d'évaluation de la qualité des sites de santé

## BREVETS

2016: Patent application No. PCT/IB2016/051158

"USE OF N-DESMETHYLCLOBAZAM IN THE TREATMENT OF CHRONIC PAIN DISORDERS AND RELATED METHODS"

Patent application No. PCT/IB2016/051158 Combined Use of oral anticoagulants and related methods

# PHD PROGRAM



**DIRECTOR: PROF. YOGESHVAR KALIA**

**SECRETARY**

Florence VON OW

**COORDINATOR**

Béatrice KAUFMANN

## GENERAL DESCRIPTION OF THE UNIT

The PhD Program in Pharmaceutical Sciences provides a solid theoretical and practical training in all aspects of the Pharmaceutical Sciences and fosters interdisciplinary research and provides opportunities for scientific exchange via lectures, symposia and networking activities. The PhD Program also aims to increase career opportunities for graduates from the School of Pharmaceutical Sciences.

## PH.D. STUDENTS

All of the doctoral students enrolled in the PhD program of the School of Pharmaceutical Sciences are subject to the regulation that stipulates the acquisition of at least 30 credits before the thesis defense can take place. It should be noted that most of the PhD students acquire more than 30 credits indicating their active participation in the PhD program (Tables 1-3). A mean number of 7.3 PhD students attended each course, which indicates a good level of participation. If we consider all of the participants, i.e. including postdocs and pre-grads, this mean value increases to more than 11.3 participants per course. This year was special due to the moving in June of the entire School to the new building and this resulted in the participation rate being a little lower than usual.

The PhD Program commission decided to introduce a new concept of evaluating the progress of the PhD thesis involving the use of a Thesis Advisory Committee or TAC, which takes place 12-15 months after the start of the doctorate. This is organized with the objective of harmonizing levels of excellence for the PhD candidates from the different component disciplines in the School of Pharmaceutical Sciences. This is done with respect to: efficient time-planning and organization of the thesis project; motivation to perform interesting projects and optimization of thesis project progression.

The TAC system is valid for all PhD candidates beginning their thesis from 15th September 2015.

## COURSES AND SYMPOSIA

In 2016, 21 activities were proposed to the registered PhD students (29, if considering each "conférence sur sujet spécialisé" separately), and 6 had to be postponed or cancelled, mainly due to the moving in June of the whole pharmaceutical sciences section to a new building. A total of 256 hours was given within the 2016 PhD program (including all activities) and level of participation of the PhD students in all five activities of the PhD program in Pharmaceutical Sciences (174 registrations of PhD students) was excellent

Due to the relocation of the School of Pharmaceutical Sciences to the new CMU building scheduled in June 2016, the PhD Day was postponed until 2017, and will be organized by the students of pharmaceutical biochemistry (FABIP and FAPER groups).

The PhD students also attended the specialized seminars ("conférences spécialisées") proposed within the PhD program; 8 seminars were given by international researchers from academia and industry, for a total of 16 teaching hours. A total of 158 participants attended these lectures including 60 PhD students, 19 post-docs and 79 professors and others (pre-graduates and senior scientists).



The 30th « extra-muros » meeting for Ph.D. students in pharmaceutical sciences was held as usual at the Parkhotel Beausite (Zermatt, VS). It took place from September 5 to 9, 2016 and was organized by Profs. Leonardo Scapozza and Yogeshvar N. Kalia, with the help of Dr Beatrice Kaufmann (doctoral school coordinator), Mrs Florence von Ow (doctoral school secretary) and Mrs Nathalie Goffin. This year meeting was entitled “Molecular Therapeutics – Discovery, Development and Delivery” aka MTD<sup>3</sup> and reviewed many aspects of the pharmaceutical sciences, from bench to bedside. Twenty national and international speakers active in academia and industry presented recent trends in various topics, which were divided in four sessions.

During the first session: “NEW TECHNOLOGIES - Changing the paradigm”, fundamental research and discovery applying new technologies in the fields of gene therapy, innovative imaging technologies or molecular dynamics were exposed.

The second session “DISCOVERY – Transforming an idea into a candidate” mainly discussed the strategies used to transform an idea into a candidate for biopharmaceuticals as well as low molecular weight compounds. Besides this, drug discovery institutes were presented, with their opportunities and challenges in a changing pharmaceutical world, and personalized cancer therapies were also briefly covered.

During the third session, entitled “DEVELOPMENT – Making a drug from a lead” the speakers presented some practical examples of means for transforming a compound into a drug.

The fourth session “DELIVERY – Taking basic science to the Patient” included many aspects related to e-Health, personalized medicine approach, and the ways of bringing this fundamental science to the patient and back, through contribution of innovative Community Pharmacy.

The meeting was attended by 69 persons (speakers included). Thirty-two participants came from the EPGL and the University hospitals of Geneva and Lausanne. Administrative people from the research unit and also professors from foreign universities attended too. As usual the meeting was evaluated by the participants. The participants were very satisfied by the scientific content of the program and appreciated the presentations of the speakers. They were very satisfied by the round table, as well as the setup of the meeting. This international “extra-muros” meeting offers PhD students with various opportunities for networking since most of the speakers spent a lot of time for informal discussions outside of the conference room.

The schedule, the content of the courses, hours and credits as well as all indications concerning the PhD program in Pharmaceutical Sciences are stored in a MySQL database and posted dynamically on the web page of the PhD program ([http://epgl.unige.ch/pharm/fr/ \[Etudes/programme doctoral\]](http://epgl.unige.ch/pharm/fr/[Etudes/programme%20doctoral])).

Table 1

List of courses organized within the PhD Program in Pharmaceutical Sciences 2015 and number of participants

Name of course 2016	Course No.	Course Organizer	Total nb of hours	Credits	Nb of PhD students (total nb of attendees)
Pharmacie hospitalière et communautaire 1	19H003	P. Bonnabry	18	3	8 (35)
Pharmacie hospitalière et communautaire 2	19H012	F. Sadeghipour	18	3	6 (26)
Design drugs with a computer	19H053	A. Daina, V. Zoete	16	2	6
Introduction to pharmaceutical industry: History, structures and Challenges	19H017	D. Hotz	30	5	7
Formulation of protein biopharmaceuticals and drug delivery	19H013	T. Arvinte	20	5	2
Drug discovery: an industrial perspective	19H063	M. Prunotto	18	3	17
Biostatistics in drug development and clinical trials design	19H055	D. Warne, F. Curtin	24	4	7

Use of fluorescence spectroscopy in the study of drugs, protein and membrane	19H032	T. Arvinte	16	3	3
Therapeutic Drug Monitoring and its Application in Diagnostics and Clinical Research	19H045	L. Decosterd	6	1	CANCELLED
Production stérile : méthodes et environnement	19H008	F. Sadeghipour	16	4	CANCELLED
Techniques de chromatographie préparative : islement de produits naturels	19H037	E. Ferreira-Queiroz	6	1	4
Introduction to plant metabolomics	19H047	J.-L. Wolfender / S. Rudaz	16	2	CANCELLED
Solving ligand-target structure	19H027	O. Vadas, A. Vujicic-Zagar	40	5	CANCELLED
Initiation aux méthodes d'analyse multivariées en sciences pharmaceutiques	19H046	J. Boccard, S. Rudaz	12	2	13
Pratique des plans d'expérience	19H022	J. Boccard, S. Rudaz	16	2	12
Library PhD Camp: from Research to Publication	19H064	L. Mellifluo	8	1	3
TOTAL	15		280		88 PhD 47 others

Table 2

List of symposia organized within the PhD Program in Pharmaceutical Sciences 2016 and number of participants.

Name of course 2015	# Course no.	Course organizer	Total nb of hours	Credits	# Nb of participants
PhD Day	19H020	Y. Kalia	8	1 or 2	CANCELLED (moving)
Conférences sur sujets spécialisés		Y. Kalia	8 days (16 hrs)	1,5 for 5 conf.	60 PhD students (158 total)
30th « extra-muros » meeting, Zermatt	19H025	L. Scapozza / Y. Kalia	5 days (30 hrs)	1 or 2	26 PhD students, 12 post-doc, 16 profs/others

Table 3

List of networking activities organized within the PhD Program in Pharmaceutical Sciences 2016 and number of participants.

Name of course 2016	Course no.	Course organizer	Total nb of hours	Credits	Nb of PhD students
L'industrie pharmaceutique se présente *	19H050	Y. Kalia	6	1	CANCELLED
Career day **	19H007	Y. Kalia	7	1	30

\*to be reorganized next year

\*\*the career day of the Faculté des Sciences was proposed to the PhD students.

## CONFÉRENCE UNIVERSITAIRE DE SUISSE OCCIDENTALE (CUSO)

The 2016 program as well as the budget were submitted to the CUSO at the end of 2015 and they were duly accepted. The budget in 2016 for the five activities (Seminar Extra-Muros, Conférences spécialisées, Cours, Symposia as well as Networking activities) was 92'000 CHF covered by the funds allocated by the CUSO.

The costs for 2016 for all the activities were 77'565.70 CHF, thus leaving 14'434.30- CHF unused. The difference between the requested budget and the costs was due to cancellation of some events (courses for a total of 11'807.80 CHF), as well as lower expenses for some courses, including "conférences sur sujets spécialisés". It should be noted that these lower than budgeted expenses for certain activities, freed up funds that could compensate for the budgeted positions for which the expenses were higher than the amounts initially budgeted.

We take the opportunity in this report to thank the CUSO for the past and future financial support allowing us to offer an outstanding program to the PhD students in Pharmaceutical Sciences.