



Centre de Neurosciences Psychiatriques

CNP SEMINAR

ANNOUNCEMENT

Friday April 19nd 2024, 11:00 – 12:00

Reciprocal cooperation in rats: function and mechanisms

By : **Michael Taborsky**

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Reciprocal exchange of service and commodities is widespread in animals, which is often underrated. Due to the time delay between successive interactions, the evolution of such cooperative behaviour is impeded by the temptation of social partners to exploit altruistic donors. Theoretical models have suggested various ways how reciprocal exchange of help can be stabilized against free-riding. However, experimental studies of animals applying decision rules that may prevent strategic exploitation are hitherto scarce. Our experiments with wild-type Norway rats show that animals can reciprocate received favours to social partners based on contingent strategies. The rules applied in such interactions reflect behavioural contingencies influenced by the quality of previous social experience, relatedness, and the request for help. Olfaction turned out to be the prevailing sensory modality involved in cooperative interactions. Intranasal oxytocin application decreases the discrimination between previously helpful and unhelpful partners. Anonymous help experience makes rats more helpful to others (generalised reciprocity), but among specific social partners the exchange of goods and services resembles an iterated tit-for-tat barter.

Invited by ron.stoop@unil.ch

Recommended reading:

- Taborsky, Frommen & Riehl (2016). "Correlated Pay-Offs Are Key to Cooperation." *Phil Trans Roy Soc B* 371: <https://doi.org/10.1098/rstb.2015.0084>
- Taborsky, Cant & Komdeur (2021). "**The Evolution of Social Behaviour.**" Cambridge: Cambridge University Press.
- Garcia-Ruiz, Quiñones & Taborsky (2022). "The Evolution of Cooperative Breeding by Direct and Indirect Fitness Effects." *Science Advances* 8: eabl7853. <https://doi.org/10.1126/sciadv.abl7853>
- Engelhardt & Taborsky (2024). "Reciprocal altruism in Norway rats." *Ethology* 130: e13418. <https://doi.org/10.1111/eth.13418>

Biosketch:

Michael Taborsky is a behavioural and evolutionary biologist studying the evolution of social behaviour and cooperation, complex social organisation, and alternative reproductive and behavioural tactics. He determined that cooperation, one of the three principal ways to succeed in resource competition, is the result of four alternative, mutually non-exclusive selection scenarios: *coercion*, *deception*, *by-product benefits*, and *altruism*. He clarified that *altruism* can evolve if payoffs for all involved parties correlate. Further, he found that *generalised reciprocity*, based on the decision rule "help anyone if helped by someone," can create stable levels of cooperation under a range of conditions. He pinpointed selection mechanisms underlying genetic and conditional alternative reproductive tactics, established the social niche concept, and outlined the key functions of extended phenotypes as signals. He and his collaborators initiated several model systems to study the evolution of social organisation, including social cichlids, wild-type Norway rats, and fungus-cultivating ambrosia beetles.



**Salle de séminaire, 1er étage du Centre des Neurosciences Psychiatriques (CNP) -
Site de Cery, CH-1008 Prilly-Lausanne**

Link for videoconference :

<https://chuv.webex.com/chuv-en/j.php?MTID=m9dba1044932d9c12e705c1de9e9c8d2e>