

The goal of the project is to elucidate the neuronal mechanism responsible for prosocial behaviors. Prosocial behaviors encompass a broad category, with common denominator being that they benefit others. They include altruistic sharing of resources, forming stable relationships or taking care of others, including care of infants. Prosocial behaviors are not exclusive to humans, they are also commonly observed among animals. Examples include sharing food, care of offspring or forming stable pairs. Likewise, prosocial behaviors are also in laboratory animals. It was observed that rats make choices that benefit their conspecifics. An elegant example comes from experiments, where rats freed another animals from a small cage, even though later they had to share palatable food with the rescued rat.

The tendency to choose outcomes that benefit another, especially when cost is involved, it implies that the prosocial choices are intrinsically rewarding. Accordingly, in studies conducted on humans and in laboratory animals it is observed that prosocial behaviors are associated with changes in activity in the brain's reward system. A particularly important role in control of social behaviors is attributed to oxytocin, which was shown to regulate pair bonding and maternal instincts in animals and decreased social anxiety, improved emotional empathy and altruism in humans. In studies conducted on animals, it was observed that a neuronal level social interactions depend on interactions among dopamine, serotonin and oxytocin signaling in the nucleus accumbens. In parallel, several older studies suggested that endogenous opioid peptides through their actions on the reward system also were a major regulator of social behavior. In this project we plan to apply novel methodology to test this notion. We will make use of genetically modified mice and drugs that block the activity of opioid receptors, to verify the potential role of the opioid system in prosocial behaviors. Behavioral testing will include two novel approaches that directly measure a behavior that provides benefit to another animals in adult mice. Additionally, we will perform a test of the effects of an opioid antagonist on volunteer who will play the ultimatum game, which measures the tendency towards prosocial behavior.