

Popular science description

Finding food in the environment is one of the most challenging tasks for animals. Predators have to find the prey that is very often well hidden; birds have to find a spot where food is abundant to build their nest there. Many animals evolved adaptations that allow them finding food efficiently – good vision and sensitive olfaction are the most obvious examples. But animals living in groups have a big advantage – they don't have to rely only on their own senses; they can observe conspecifics to get information about the localization and the quality of food. Research shows that guppies living in bigger shoals find food faster than fishes in smaller shoals; rats can use a breath of a conspecific rat to get information about the palatability of a new food.

Although we have knowledge about the ecological aspects of the social transfer of information about the localization of food between animals, the neural basis of this phenomenon is understudied. I developed a simple behavioural paradigm that allows gaining an insight into this issue. In my test, two rats (demonstrator and observer) transfer information about the localization of the food in a two-chamber cage. I showed that demonstrator rats that have found food in one of the chambers can transfer this information to the observer rats, which will develop a preference for the chamber where food was found. Using recently developed 3D tracking device I will analyze in detail the behaviour of the rats during social interaction (when the transfer of information takes place) to get an insight about how this transmission is taking place. Moreover, I will study exploratory behaviour of observer rats to see how the socially acquired information influences the way animals search for food. Most importantly, I will use small microscopes attached to rat's heads to see how the information about the localization of food changes neural activity in the hippocampus – it will allow me to test if this information changes something in the brain map of the environment.

My project will allow gaining a detailed information about how animals share information about the localization of the food and how this information shapes their behaviour and the way they perceive their environment. It is especially important knowledge nowadays when the fragmentation of animal habitats, deforestation and climate change severely disturb animal's access to information – groups of animals separated by roads or deforested patches are less efficient in finding food and may be more prone to extinction.