

Bees yield clues to unlocking brain disorders

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(Medical Xpress) -- Queensland Brain Institute researchers are a step closer to unlocking the mysteries of disorders like schizophrenia and autism – through peering into the brains of bees.

The cascade of molecular changes that take place in honeybees' brains when they process and learn [sensory information](#) has important parallels for human brains, says QBI's Dr. Judith Reinhard.

“Honeybees are a great model system for understanding the functioning of both healthy brains and [brain disorders](#), because many of the underlying processes are similar in insects and humans,” she said.

Dr. Reinhard and her colleague Dr. Charles Claudianos have been observing how bees process scents and learn to associate particular odors with sugar rewards.

They have then used cutting-edge molecular techniques to explore the changes that occur within the bees' brains after odor memories are formed.

“When sensory information is processed, particular changes occur in the expression of the molecules that facilitate communication between neurons,” Dr. Reinhard explains.

“We're now interested in what happens when this molecular communication goes awry, as we suspect is the case with mental disorders such as [schizophrenia](#) and [autism](#).”

“If we can understand how molecular mis-communication in neurons is linked to mental disorder, it may help us find cures for these conditions.”

Dr. Reinhard's work with honeybees is just one aspect of her research in the field of neuroethology – a multidisciplinary branch of neuroscience which explores how the brain translates sensory information into behavior.

A particular focus within her laboratory is the sense of smell and its role in memory formation and cognitive processes.

“Olfactory memories are extremely salient and, for example, a whiff of perfume you encounter in the street can suddenly trigger recall of a long-forgotten event or person,” she said.

“Odours also affect decision-making, a fact which is used in department stores and bakeries to manipulate you into buying their goods.”

Beyond serving as a model for human [brain](#) function, insects are useful in olfactory research for a range of other reasons, Dr. Reinhard said.

“The experimental design is simpler, you get results quickly, and they don't have mood swings and changes of mind like human subjects,” she said.

Provided by University of Queensland

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