

# Researchers discover the brain circuits that rapidly detect friend or foe

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Scientists have identified the brain circuits that enable fast recognition of emotions such as anger and happiness, providing insights into disorders such as anxiety and psychosis.

The University of Queensland study found three key components in the rapid processing of emotions to quickly recognize a potential friend or foe—an ability essential to survival.

The UQ Queensland Brain Institute researchers were able to link a bundle of fibers deep within the brain to human social behavior, for the first time.

Lead author, Dr. Ilvana Dzafic said the fiber bundle, known as stria terminalis, was involved in fast emotion processing in threatening [social situations](#).

"People with psychotic and [anxiety disorders](#) have an altered stria terminalis pathway," said Dr. Dzafic, who is now based at the University of Melbourne.

"Our discovery may explain the link between these disorders and deficits in emotion processing, and also potentially inform treatment targets.

"People with psychosis may perceive threat from others when it is not there, while those with anxiety and post-[traumatic stress disorder](#) may have an abnormally high anticipation of threat."

To create a realistic simulation of dynamic emotion, researchers showed videos of an actress portraying either happy or angry emotions to 46 healthy male volunteers while they underwent MRI scans.

There were two other brain pathways identified; one of these was a region of the brain located within the [temporal lobes](#)—known as amygdala, and the other was an attention network, connected to the temporoparietal junction, an area of the brain involved in re-orienting attention.

The team found that the brain networks that helped to recognize emotion changed depending on whether the participant was expecting to see the emotion with which they were presented.

"The amygdala network facilitated fast recognition of anger when people expected a threat, whereas the [attention network](#) was important for recognizing unexpected threats," Dr. Dzafic said.

Researchers said the next step was to expand the research to include female volunteers, as the stria terminalis structure is different in males and females.

Dr. Dzafic will also examine people with threat-induced anxiety to understand if the stria terminalis is important during learning in [stressful situations](#), work which will be led by Associate Professor Marta Garrido at the University of Melbourne.

The findings from the study, led by senior scientists Associate Professor Hana Burianová and Professor

Bryan Mowry and funded by the Australian Research Council, were published in *Human Brain Mapping*.

**More information:** Ilvana Dzafic et al. Stria terminalis, amygdala, and temporoparietal junction networks facilitate efficient emotion processing under expectations, *Human Brain Mapping* (2019).  
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