

# Research links 'brain waves' to cognition, attention and diagnosing disorders

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Professor Jason Mattingley, Foundation Chair in Cognitive Neuroscience at The University of Queensland, released his findings into 'brain waves' at the Australian Neuroscience Society's (ANS) annual conference last week.

'Brain waves' are the oscillations produced by the [brain](#), which are thought to contribute to its remarkable capacity to integrate information about the world.

According to Professor Mattingley's research, brain oscillations can be linked to sleep, navigation, cognition, attention, and to diagnosing a wide range of disorders including autism, schizophrenia and epilepsy.

To understand how the brain filters information during visual attention and perception, Professor Mattingley and his fellow researchers encouraged subjects to perform tasks involving the use of flickering stimuli on a computer display. This included embedding colour-coded visual information to see how well subjects track a specific target colour from a myriad of distracting information.

“Imagine the brain as a stadium full of sports fans. Each spectator is like an individual neuron in the brain. Now imagine the spectators starting a Mexican wave that sweeps through the crowd from one side of the stadium to the other. Our research shows that neurons in the brain act in much the same way. Distinct waves of neural activity, moving at different speeds and in different directions, help coordinate neurons

across widely separated areas of the brain,” Professor Mattingley said.

“We can measure these [brain waves](#) as people engage in different tasks, such as focusing their attention on just one colour in multi-coloured display. The measurements we take from the brain are a bit like the ripples from a handful of pebbles thrown into a pond.”

“While interesting in their own right, these studies are also relevant to brain dysfunction, as defects in neural responses to flickering visual stimuli have been found in individuals with autism, schizophrenia, and epilepsy, and such oscillations have been found to be significantly altered in aging, depression, and neurodegenerative disorders. Using these tasks may help to both diagnose and understand the basis for differences in brain function in people with these conditions.”

The Australian Neuroscience Society's (ANS) annual conference brings together researchers in search of a greater understanding of the human nervous system and its functions.

As part of the program around 100 international speakers and delegates shared their insights into the peripheral senses - touch, sight, hearing and smell – perception, cognition, learning and memory, with a particular focus on neurological and neurodegenerative disease.

Provided by University of Queensland

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