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IISc discovers mechanisms vital for developing therapies for disorders like ADHD

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Perceptual advantage is lost when object changes suddenly: Study

Two new studies from the Centre for Neuroscience (CNS), Indian Institute of Science (IISc), Bengaluru explore how closely attention and eye movements are linked, and unveil how the brain coordinates the two processes.

Scientists have long suspected that attention is tightly coupled to rapid eye movements, called saccades. In fact, even before our eyes move towards an object, our attention focuses on it, allowing us to perceive it more clearly – a well-known phenomenon called pre-saccadic attention.

However, in the new study, the researchers at CNS show that this perceptual advantage is lost when the object changes suddenly, a split second before our gaze falls upon it, making it harder for us to process what changed.

Using a special kind of electrode called a “U-probe”, researchers recorded signals from hundreds of neurons across different layers of a specific region in a monkey’s brain called the visual cortex area V4. What they found was that neurons in the more superficial layers of the cortex generated attention signals, while neurons in deeper layers produced eye movement signals.

The researchers believe that uncovering such brain signatures can eventually point to what fails in attention disorders such as attention deficit hyperactivity disorder (ADHD).