

# Extracellular vesicles help pass information between cells and onto offspring

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New studies reveal that small, membrane-bound particles transported between cells have wide-ranging and long-term effects in the brain and throughout the body, from helping neurons communicate to passing the effects of stress onto the next generation. Such extracellular vesicles released from the brain into the blood can also provide a window into brain pathology to help with disease diagnosis. The findings were presented at Neuroscience 2018.

Extracellular vesicles are small bubbles of cell membrane that break off from cells and carry proteins, lipids, and nucleic acids to other cells. They are produced by most tissues in the body, including the brain, and can target cell types with high specificity, giving them an important role in cell-to-cell communication.

Today's new findings show that:

- Retroviral properties of the neuronal protein Arc help regulate brain circuits via a novel type of intercellular signaling (Jason Shepherd, abstract 465.20).
- In male mice, stress-induced changes in the contents of extracellular vesicles that fuse with [sperm cells](#) may disrupt the health and development of offspring (Tracy Bale, abstract 500.13).
- A simple blood test that analyzes the contents of small vesicles released from [brain cells](#) may help distinguish between neurological disorders with similar symptoms (Gal Bitan, abstract

750.10).

"The findings presented today demonstrate the utility of [extracellular vesicles](#) and their role in various processes throughout the brain," said press conference moderator Robert Rissman, Ph.D., of the University of California, San Diego, who is an expert on exosomes and their involvement in disease pathogenesis. "They may be the key to understanding how proteins and other signaling molecules are transferred between [cells](#) of the brain and periphery and when isolated from blood, may be key to developing readily available diagnostic tools to potentially predict diseases as well as understand normal function."

Provided by Society for Neuroscience

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