Neurons can use local stores for communication needs

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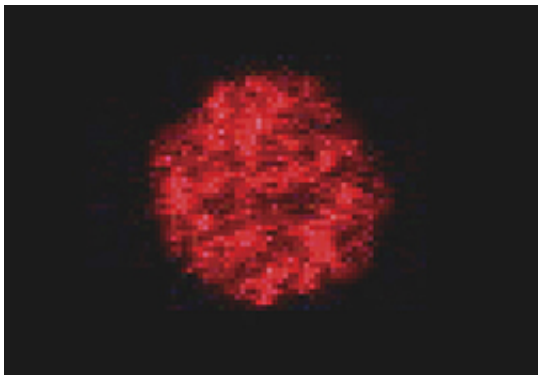

The localization of ryanodine receptors (red) in an isolated nerve terminal from the posterior pituitary gland is depicted in this image. Credit: McNally et al., 2014

Researchers reveal that neurons can utilize a supremely localized internal store of calcium to initiate the secretion of neuropeptides, one class of signaling molecules through which neurons communicate with each other and with other cells. The study appears in *The Journal of General Physiology*.

Neuropeptides are released from neurons through a process that—like other secretory events—is triggered primarily by the influx of calcium into the neuron through voltage-gated channels. Although neuropeptides are stored in large dense core vesicles (LDCVs) that also contain large amounts of calcium, it has been unclear whether these locally based calcium supplies can also be used to modulate secretion.

A team of researchers led by José Lemos from the University of Massachusetts Medical School examined the mechanisms at play during secretion of vasopressin from nerve terminals in the posterior pituitary gland, which releases the neuropeptide into the blood so that it can make its way to the kidney and regulate water retention. The researchers found that certain intracellular calcium channels known as ryanodine receptors are likely responsible for mobilizing calcium from LDCVs to facilitate vasopressin release.

The findings indicate that neurons have a greater capacity than previously appreciated to fine-tune the release of neuropeptides and thereby their communications with other cells.

More information: Paper: McNally, J.M., et al. 2014. *J. Gen. Physiol.* DOI: 10.1085/jgp.201311110

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