Mysterious ancient organism may be clue to evolutionary origin of nerve cells

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Trichoplax, a flat, sheet-like creature about half a millimetre across, is the only known member of a phylum called the Placozoa. This species seems little changed from the Ediacaran period, before the Cambrian explosion of animal life.

The Ediacarans are a mystery, not least because none of those known from fossils has any sign of a gut, or any other obvious way of feeding itself. But a study of *Trichoplax*, just published in *PLOS One*, by Carolyn Smith of the National Institute of Neurological Diseases and Stroke, in Bethesda, Maryland, and her colleagues, may explain how they did it.

Trichoplax's six cell types do not include muscles. Instead, the animal moves around using whip-like cilia that grow out of one of these cell types. Their beating permits it to glide smoothly over surfaces, in search of prey.

Their hunting behavior is impressive for a creature that has no nerves to carry signals around its body. It does, though, have "fibre cells" that are connected by junctions which may be precursors of the synaptic junctions of actual nerves. It also has gland cells that contain peptides of the sort used by nerve cells for signalling. Perhaps these fibre cells and gland cells are precursors of nervous systems.

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