

Evolutionary molecule identified by researchers

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(Phys.org) -- Researchers at the University of Dundee have identified a molecule that could play a key role in how cells develop into the building blocks of life.

[Developmental biologists](#) try to understand how cells that are at first identical differentiate into the specialised cell types that make up tissues and organs.

Now researchers in the College of Life Sciences at Dundee, led by Professor Pauline Schaap, have identified a molecule called cyclic-di-GMP as being the 'signal' which can induce differentiation into stalk cells.

The Schaap laboratory studies a simple multicellular organism, *Dictyostelium*, in which motile cells (those which can move spontaneously) differentiate into two immobile cell types: stalk cells and spores.

In earlier research they showed that cyclic AMP induces the differentiation of [spores](#). Now they have identified another molecule, cyclic-di-GMP, as the signal that induces the differentiation of stalk cells.

The new research is published in the journal *Nature*.

"Our work presents the opportunity to fully understand how cells learned

to become different from each other in early [multicellular organisms](#)," said Professor Schaap.

"These findings are also remarkable because cyclic-di-GMP was previously only found in bacteria, where it causes bacteria to lose motility and transform into large sticky colonies, known as biofilms. The fact that an organism like Dictyostelium, which is very far removed from bacteria, uses the same mechanism is very interesting and suggests that the processes which cause [cell differentiation](#) in eukaryotes, like ourselves, may have very deep [evolutionary origins](#)."

Provided by University of Dundee

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