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Brain cell discovery could open doors to targeted cancer therapies

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Fresh insights into the processes that control brain cell production could pave the way for treatments for brain cancer and other brain-related disorders.

Scientists have gained new understanding of the role played by a key molecule that controls how and when nerve and brain cells are formed – a process that allows the brain to develop and keeps it healthy. Their findings could help explain what happens when cell production goes out of control, which is a fundamental characteristic of many diseases including cancer.

Researchers have focused on a RNA molecule, known as miR-9, which is linked to the development of brain cells, known as neurons and glial cells. They have shown that a protein called Lin28a regulates the production of miR-9, which in turn controls the genes involved in brain cell development and function.

Scientists carried out lab studies of embryonic cells, which can develop into neurons, to determine how Lin28a controls the amount of miR-9 that is produced.

They found that in embryonic cells, Lin28a prevents production of miR-9 by triggering the degradation of its precursor molecule. In developed brain cells, Lin28a is no longer produced, which enables miR-9 to accumulate and function. In cancer cells, Lin28a production is re-established, and as a result this natural process is disrupted.

Researchers used a series of lab tests to unravel the complex processes that are directed by the Lin28a protein. They say further studies could help explain fully the role of Lin28a and miR-9 in brain development, and pave the way to the development of novel therapies.

Dr Gracjan Michlewski of the School of Biological Sciences, who led the study, said: "Understanding more of the complex science behind the fundamental processes of cell development will helps us learn more about what happens when this goes wrong – and what might be done to prevent it."

The study is published in *Nature Communications*.

Provided by University of Edinburgh