Stopping cancer in its tracks?

August 27 2013, by Tracey Peake

We've come a long way in cancer treatments – we have powerful, effective drugs for many types of cancer and we're moving toward ever more specific, less invasive therapies. But the problem with cancer is that it's always in motion, metastasizing and spreading throughout the body to overwhelm it. What if you could stop cancer in its tracks?

Ken Adler, a cell biologist at NC State, may be on to a way to do just that. Adler, who studies cell movement in lung diseases like chronic bronchitis and asthma, developed a peptide, or small protein molecule, that stopped inflammation by inhibiting the movement of inflammatory cells.

As it turns out, that peptide, called the MANS peptide (for Myristoylated Alanine-Rich N-terminus sequence, if you were wondering), looks like it may also be effective in stopping the movement of other cells, like lung-cancer cells.

In collaboration with a team of scientists from UC Davis including researcher Reen Wu, Adler showed that the MANS peptide stopped lung-cancer cells from moving, or metastasizing, in mice. Their research results appear in the journal *Oncogene*.

So how, exactly, does a peptide stop a cell from moving?

Adler has spent a very long time looking at a particular protein known as MARCKS (or Myristoylated Alanine-rich C Kinase Substrate) and its involvement in cell movement. When MARCKS is activated, it binds to the cell's cytoskeleton (the scaffolding inside a cell), and specifically to a protein called actin, which contracts, as well as to the inside of the cell membrane. MARCKS links the actin and the membrane so that actin's movement translates into cell movement.

MANS works by binding to the membrane at the sites that MARCKS would normally use, crowding MARCKS out. The actin is still doing its job, but the link between the actin and the membrane is broken and the cell stays put.

Adler plans to continue studying the mechanisms that make MARCKS work, as well as the effects of the MANS peptide on metastasis. "Once we get to the basic mechanism of MARCKS, we'll have a lot of tools at our disposal to use in treating cancer, as well as other diseases," he says.

Provided by North Carolina State University