Lights out: A protein may switch off cancer cells

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(PhysOrg.com) -- A protein acting as a switch to activate the cell death process may prove to be an effective targeted treatment for killing cancer cells.

University of Michigan researchers discovered that the protein called RIP plays a role in mediating both the life and death of squamous cell carcinoma cancer cells, said Yvonne Kapila, associate professor, Department of Periodontics and Oral Medicine at the School of Dentistry.

This is key because cancer cells elude the normal cell death process. If that process could be activated artificially by a targeted introduction of RIP into cancer patients, those cells could be destroyed before they circulate out of control in the body, Kapila said.

The findings are promising but still a long way from being used as a therapy, Kapila said. Researchers still need to show that introducing RIP is safe before it can be tested in humans.

Kapila's lab set out to find a mechanism that activates cell life and death. "The cell must analyze multiple signals and say, 'OK, am I going to die or am I going to live,'" Kapila said. "We felt there must be some kind of communication between pathways of life and death otherwise the cell will be confused and not know what to do."

Researchers looked at squamous cell carcinoma cells from head and neck tumors and also fibroblasts from mice, but the findings could apply to other cancers as well since the death process is largely the same. They found that RIP was indeed the communicator, interacting with a cell death protein called FAS and with a protein called FAK during cell survival conditions.

Normal cells usually need to attach to a matrix to survive, and die if detached, Kapila said. This unique type of cell death caused by detachment from the matrix is called anoikis. Cancer cells can detach from a matrix but elude anoikis and circulate freely, which allows them to spread and metastasize in the body.

"This is a great advantage," Kapila said. "They can go wherever they like and find a happy home and set up shop there."

Next, researchers modified, or knocked out, portions of RIP to see which parts were critical in each process, Kapila said.

"In the future if one were to use this for therapy, if we know which pieces of the protein are important for each function, we know where to focus," Kapila said.

The next step is to study the process in mice and analyze patient samples of RIP at different levels.

In a separate project, Kapila's group is examining a separate molecule and its success in shrinking tumors, and how it interacts with RIP.

More information: Receptor-interacting protein (RIP), shuttles between cell death and survival signaling pathways

Provided by University of Michigan

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