Researcher studies blood vessels that feed tumors

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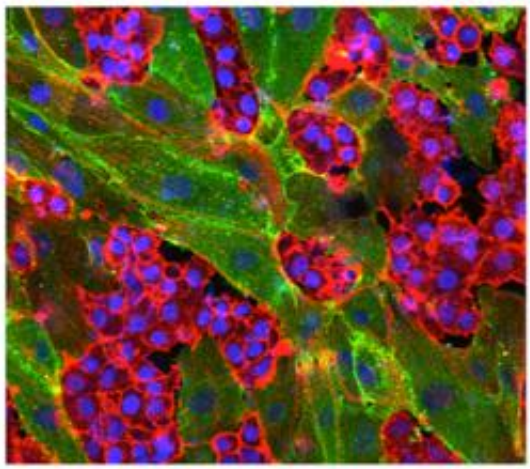

This image shows endothelial cells -- a thin layer of cells that lines the interior surface of blood vessels -- seeded on the surface of an engineered 3-D tumor model (proliferating tumor cells in red, endothelial cells in green, cell nuclei in blue). Credit: Scott S. Verbridge

(PhysOrg.com) -- Federal stimulus funding helps Cornell researchers create tiny 3-D models of tumors to mimic conditions necessary for the development of vascular systems by tumors.

For years, researchers have struggled to understand how tumors create blood vessels that facilitate tumor growth, so that one day, they can learn to block the development of these vessels and starve the tumor.

Now, with federal stimulus funding from the American Recovery and Reinvestment Act (ARRA), Cornell researchers will create tiny 3-D models of tumors to mimic conditions necessary for tumor angiogenesis -- the development of vascular systems by tumors. Using such models, the researchers will specifically study characteristics of blood vessels that feed tumors and transport stem cells, which, in turn, play a role in developing a tumor's vascular system.

The research team -- including Claudia Fischbach-Teschl, assistant professor of biomedical engineering; Abe Stroock and Jeff Varner, assistant professors of chemical and biomolecular engineering; and Vivek Mittal, associate professor of cardiothoracic surgery at Weill Cornell Medical College -- will receive $633,000 over two years.

The funding will support three graduate students and a postdoctoral researcher to work on the project.

Among other things, the researchers hope that developing a microfluidic 3-D tumor model will allow them to examine how such essential soluble elements as dissolved oxygen are transported in blood to tumors. The researchers will also flood the system with bone marrow-derived stem cells that play a role in tumor vascularization.

"We will look at how and where they incorporate and be able to study these cells qualitatively and quantitatively," said Fischbach-Teschl.

The researchers will also use mathematical modeling to study underlying molecular signaling pathways involved in tumor angiogenesis.

To date, Cornell has received 121 grants from ARRA, totaling $99,671,305.

Provided by Cornell University (news : web)

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