

Pond scum could be key to new cancer therapies

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Researchers at the University of Illinois at Chicago College of Pharmacy are collaborating with the Ohio State University and two other organizations to discover new cancer therapies derived from natural sources such as pond scum and plants from tropical rainforests.

UIC will receive nearly \$3 million of the \$8 million federal grant to complete multiple projects over five years. Along with Ohio State and UIC, Research Triangle Institute in North Carolina and Bristol-Myers Squibb will assist in the projects. The grant is funded by the National Cancer Institute.

Cyanobacteria, also referred to as blue-green algae or pond scum, is found in nearly every habitat, from oceans to fresh water to bare rocks to soil, and is a source of many unique chemical structures. UIC researchers, led by principal investigator Jimmy Orjala, assistant professor of pharmacognosy, will collect small samples of pond scum throughout the Midwest and grow them in liquid solutions in a temperature-controlled laboratory.

Using methodology he developed to speed up drug discovery from bluegreen algae, Orjala will be able to identify pure active compounds at submilligram levels.

"Our goal is to discover naturally occurring anticancer lead compounds that will be more effective than currently available cancer chemotherapeutic agents," Orjala said. If any appear promising, the



researchers will grow larger amounts for further evaluation.

Steve Swanson, associate professor and assistant head for research in medicinal chemistry and pharmacognosy, leads the team of UIC researchers that will analyze the biological materials for biological activity once they have been extracted from the algae.

The team will employ assays involving key cellular targets such as the proteasome, which is responsible for breaking down proteins in the cell, Swanson said.

"Cancer cells are known to be particularly sensitive to proteasome inhibitors. Another assay is designed to discover agents that inhibit the enzyme histone deacetylase, which plays a key role in gene expression and is often dysregulated in cancer cells," he said.

Should new compounds be discovered that act on these targets, more detailed studies will be conducted to determine exactly how the substance behaves in cells and in animals, Swanson said.

In addition to the cyanobacteria, plant materials from tropical countries collected by Doel Soejarto, professor of pharmacognosy, will also be analyzed. Information found on UIC's NAPRALERT database, which catalogs biological activities of many plant species found throughout the world, will be used in the project.

Source: University of Illinois at Chicago

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