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1st International Conference, NCI Partnership Highlight UC Research in RNA Nanotechnology

CINCINNATI—University of Cincinnati (UC) biomedical engineering professor Peixuan Guo, PhD, is expanding his work with RNA nanotechnology with a five-year National Cancer Institute (NCI) grant and a new international conference held this month to explore the possibilities for RNA in nanotechnology.

The 2010 International Conference of RNA Nanotechnology and Therapeutics will be held Oct. 23-25 in Cleveland. Guo, Dane and Mary Louise Miller Endowed Chair in biomedical engineering, serves as director of UC's NIH Nanomedicine Development Center and will chair the conference.

"The conference will be the first of its kind to bring together the brightest minds throughout the world to disseminate their knowledge involving RNA nanotechnology and its applications," says Guo. "We hope to promote collaboration among these researchers for advancing this interesting emerging field of science."

Guo was recently named principal investigator for a \$2.4 million award from the National Institutes of Health's NCI. The NCI awarded UC the five-year grant to establish a "Cancer Nanotechnology Platform Partnership" for the study of RNA nanotechnology in cancer therapy.

The award will help to create an interdisciplinary team of biomedical engineering scientists, cancer biologists and RNA and DNA nanotechnology experts, including Malak Kotb, PhD, chair of UC's molecular genetics, biochemistry and microbiology department.

Guo says RNA's unique diversity of function and structure makes it an exciting tool for researchers focused on nanotechnology, or the engineering of functional systems at the molecular scale.

"The study of nanotechnology has moved beyond imaginable possibilities," says Guo. "RNA is particularly attractive as a building block for assembly in nanotechnology and nanomedicine—it can be manipulated as easily as DNA, but possesses the versatility in structure and catalytic function similar to that of proteins."

At UC, researchers will focus on constructing RNA nanoparticles for specific targeting of cancer cells and drug delivery to the cells, developing new ways to screen for stable segments of RNA that can target and enter cancer cells in models of ovarian cancer, liver cancer and leukemia.

The grant is part of the second phase of the NCI's Alliance for Nanotechnology in Cancer program, which funds researchers working to leverage the specific advantages of nanotechnology to improve the diagnosis, treatment and prevention of cancer. The phase includes an investment of approximately \$30 million per year for the next five years to more than 30 investigators across the country.

Guo has pioneered RNA nanotechnology since 1998, when his lab discovered that RNA nanoparticles in the bacteriophage phi29 virus can self-assemble into RNA nanoparticles to gear a nanomotor to power DNA into the virus protein shell.