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current issue
archive / search
contact

Chemistry professor receives Dreyfus

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Rustem Ismagilov, Assistant Professor in Chemistry, is one of 11 scientists nationwide to receive a 2001 New Faculty Award from the Camille and Henry Dreyfus Foundation of New York City.

The five-year, $40,000 award provides funding for new faculty members at the start of their research and teaching careers.

Ismagilov studies the chemical complexity of biological systems that are largely governed by the interactions between multiple chemical reactions. He uses microfabrication and microfluidics as synthetic tools with which to control systems of chemical reactions and interactions among them.

Microfabrication is the technique for making structures thinner than a human hair, including networks of channels that can transport fluids. The study and use of these channels is called microfluidics.

“Microfluidics-like techniques are responsible for the success of the Human Genome Project and the fact that it was completed 10 years early,” Ismagilov said.

One long-term goal of this research is to provide experimental tools for understanding the biochemical complexity that is emerging from genomics and proteomics—the effort to map the human genome and its proteins. Another goal is to design intelligent microsystems that use multiple interacting organic and biochemical reactions to detect, transmit, amplify and analyze chemical signals.

Ismagilov also is interested in the principles that govern the generation of motion in organic material on the small scale and how these principles might change as organic materials shrink to the molecular scale.

He is developing guidelines for the design of nanometer-scale organic materials that can change shape under the influence of electric fields, and for design of machines the size of molecules.