Makriyannis feted by grant agency for quality, depth of research

Cures for what ails us

BY SUSAN SALK

Imagine: A drug that could end food cravings and lower your cholesterol at the same time; a drug that could ease neuropathic pain; a drug that could break the body's addiction to substances such as tobacco or cocaine; a drug that could bring appetite back to chemotherapy patients.

Professor Alexandros Makriyannis, the George D. Behrakis chair of pharmaceutical sciences and director of the Center for Drug Discovery, does more than wish for blockbuster drugs that could treat so many ills. He works toward that goal every day.

Since coming to Northeastern in 2004, having already built an extensive research career around development of novel therapies from cannabis, Makriyannis has flowered in both research and recognition.

scholarship

Last month, Makriyannis received a prestigious Merit Award from the Medication Development Division of the National Institute on Drug Abuse for his work on drugs to combat methamphetamine addiction and in recognition of his major contributions to drug discovery.

"The award recognizes Dr. Makriyannis' demonstrated research excellence in the field of drugs of abuse and his longstanding pre-eminence as an authority in the field of drug design and discovery on cannabinoid mediators of cell function and the pharmacological modulation of the endocannabinoid signaling system," according to a press release.

The award, his second, doubles the financial backing of the National Institutes of Health, bringing in an additional $3 million to $4 million in funding, while also reinforcing the validity of his research.

"It's really an honor to be recognized in this way," said Makriyannis. "To me, this is one of the nicest awards because there is some substance to it."

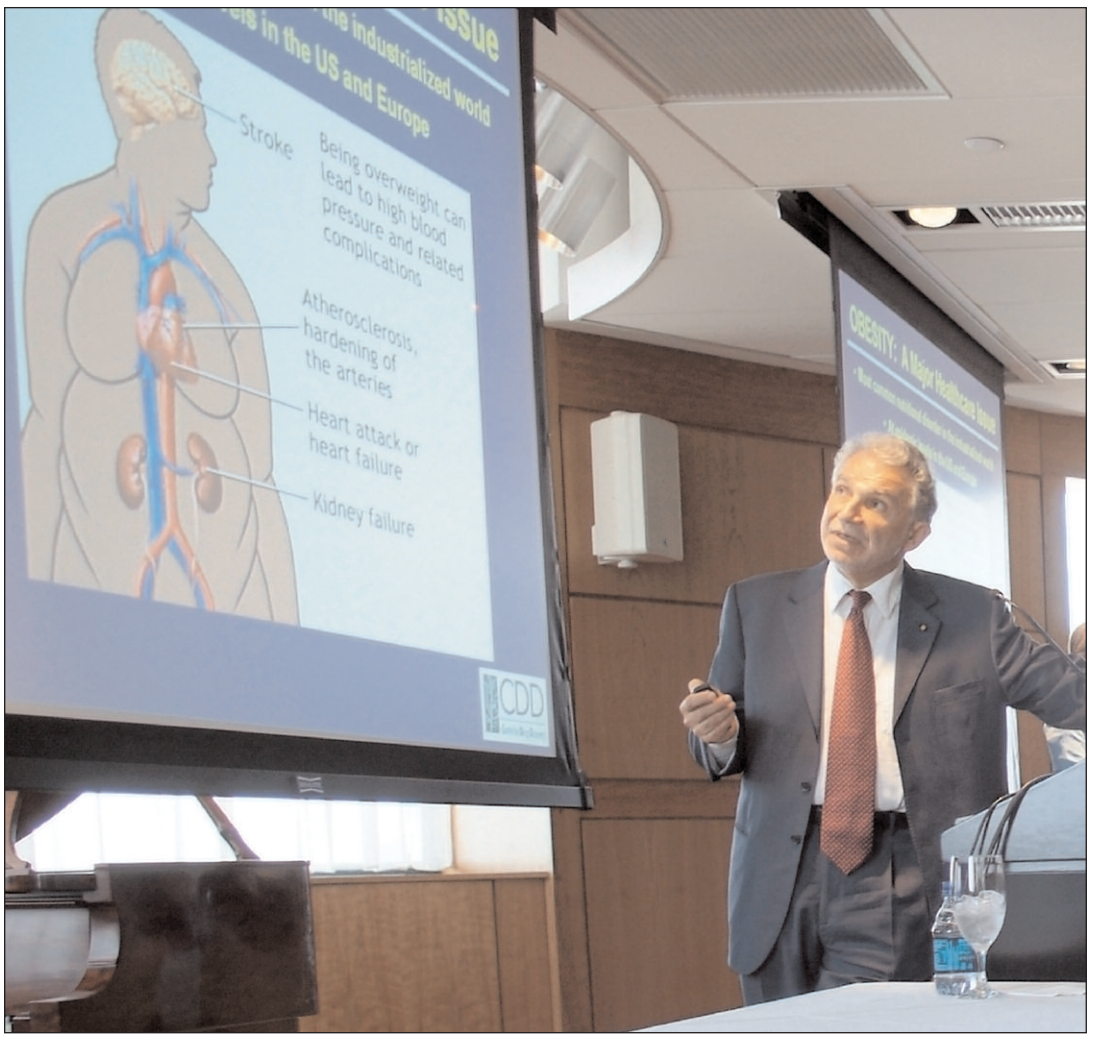
Under terms of the grant, Makriyannis is principal investigator for "Cannabinergic Medications for Methamphetamine Addiction," and will work with Jack Bergman of Harvard Medical School/McLean Hospital, according to Makriyannis' office.

His Center for Drug Discovery is committed to just such vigorous research into therapeutic pharmaceuticals.

Explaining his work, Makriyannis asked that one imagine switches in the brain that influence pain, addiction and appetite. The switches, or receptors, contained within the body's endocannabinoid system, help regulate the immune and central nervous systems, and influence vital functions such as motor control, cognition, memory, pain, appetite and vascular behavior.

The trick is in finding ways to flip those switches. Makriyannis' tools: using the computer and other biophysical approaches to design and create new molecules.

As he continues to strive toward creation of a blockbuster drug, Makriyannis estimated he has created more than 6,000 new molecules during his 20-plus year career. Cannabinoid researchers are "perfectly poised" to develop novel drugs, Makriyannis argued in "The Dawn of A New Breed of Drugs," published in the 2006 issue of the Northeastern research magazine Synthesis.



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For example:

• Makriyannis is working on a better version of the French anti-obesity medication Accomplia, but one without the commonly occurring side effects of depression and nausea.

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His drug, which would "control the desire for food," boosts good cholesterol levels and reduce the bad, would work by controlling appetite receptors in the brain, he said. Already in advanced, pre-clinical studies, the drug is about a year away from human testing, he said.

• Cancer patients experiencing nausea from medical treatment could use a drug already developed in his laboratory to stimulate their appetite.

• Drugs could be created to enhance a naturally occurring, localized reaction to pain, and would be effective in combating anything from pain of a sports injury to skin sensitivity caused by the herpes virus, diabetes or late-stage cancer, he said.

"We've already found some compounds that can attenuate this pain very successfully," Makriyannis said. Animal trials on neuropathic pain blockers are under way, he said.

With his most recent Merit Award, Makriyannis will continue to press for new drugs to combat addiction to a class of methamphetamines, cocaine, smoking and steroids, he said.

The goal is to create a medication that can manipulate receptors controlling addiction in ways similar to the way active, small molecules in cannabis react in the body.

Makriyannis was one of the first major hires under the university's five-year, $75 million Academic Investment Plan to bring in 100 new faculty. At the time, his scientific expertise and leadership in drug design were hailed as ideal qualities for a leader in Northeastern's research efforts.

Makriyannis, who earned his doctorate in medicinal chemistry from the University of Kansas and completed postdoctoral study at Berkeley, said this university was a very good place for him to work. "It's easy to interact with fellow scientists at Northeastern," he said, "and the proximity to Boston's research hub makes it an ideal setting for my work."