



SPECIAL DELIVERY

Ingesting even one pill can be tricky—as evidenced by the small pile of drug information American consumers now receive with their prescriptions—but juggling multiple medications contains a veritable obstacle course of potholes, from combinations that produce weird side effects to those that could actually reduce the drugs' effectiveness.

A group of Auburn scientists has tackled the problem, developing a new way of controlling how drugs are released into the body, which in turn can reduce the frequency of doses and side effects from multiple medications. Researchers Mark Byrne of chemical engineering, Jacek Wower of animal sciences and former graduate student Siddarth Venkatesh '08 have harnessed the power of nucleic acids to control the rate, release amount and delivery location of medicines in the human body.

"We anticipate tremendous benefits to the treatment of

various cancers and viral infections," says Wower. "There is a need to create tailor-made treatments for these kinds of diseases, because one person may respond differently to a medication than another. Medicine of the future will take into account a unique genetic blueprint of every patient, increased risks for certain illnesses and how patients respond to disease and therapy."

The researchers use tiny RNA molecules called aptamers to control the release of drugs. For each individual patient, drug delivery can be set to occur at various rates or under certain conditions, including exposure to an enzyme or reaching a specific temperature. The technology is capable of delivering doses of multiple drugs at different rates or a single drug at controllable and extended rates from one medical device.

"Nucleic acids work well for controlled drug delivery, other nucleic acids and proteins," says Byrne.