

Personalizing drug development using big data

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Associate professor of neurology Rui Chang. Credit: Alison Mairena/Tech Launch Arizona

A new computer program developed at the University of Arizona College of Medicine—Tucson and recently licensed to startup INTelico Therapeutics, LLC, is pushing the envelope of precision medicine. By integrating the genetic information from millions of patients, researchers are able to use the new technology to predict the effects of personalized

courses of drug therapy based on an individual's unique genetic makeup.

The program brings together [big data](#) from large patient populations and builds groups based on individual genetic makeup and how individuals respond to various medications. Researchers are then able to take [genetic data](#) from new patients and align it to these historic groups, allowing them to predict how diseases will progress in new patients, as well as how they will respond to therapies.

Associate professor of neurology Rui Chang and his colleague Eric Schadt, dean for precision medicine at the Icahn School of Medicine at Mount Sinai, created the algorithm which brings together big data from a variety of sources such as DNA and RNA sequencing, proteomics, metabolomics and epigenetics.

"With this technology, I'm excited to build an atlas of disease models to create a holistic way to swipe through the disease data, and then, within each disease section, find the targets for that disease," Chang said.

The inventing team worked with Tech Launch Arizona, the UA office that works with university inventors to commercialize inventions, to protect the intellectual property and license it to their startup, INTelico Therapeutics, LLC.

With guidance from mentors-in-residence Mike Sember and Kevin McLaughlin, Chang gained valuable business advice through TLA's I-Corps program, a six-week intensive course that teaches academic entrepreneurs about lean launch methodology and customer discovery.

"Rui has great energy and passion for his vision around harnessing computational power for improved drug application and patient care. It was a pleasure working with him and I wish him success," McLaughlin said.

The company plans to use the program to provide services to researchers at [academic institutions](#) and [pharmaceutical companies](#), allowing them to run bioinformatics on their proprietary patient data to help them develop new, more effective drugs more quickly and cost-effectively.

"Dr. Chang has worked with different research groups at various institutions using this algorithm and validated the targets that it found in several publications. The goal is for the company to grow and provide critical services to the biomedical industry to find precision cures for diseases that don't have cures yet," said Lisa Lin, licensing manager for the College of Medicine-Tucson.

Provided by University of Arizona

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