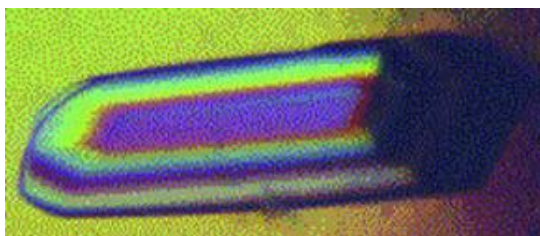




Automating Drug Discovery with Robots

DISCOVERY

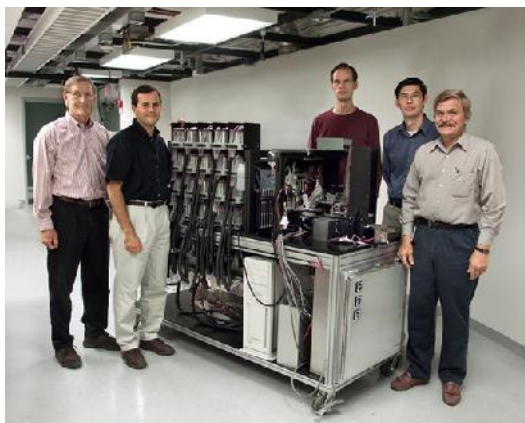


Most available pharmaceuticals target proteins. Crystallizing a protein as part of a process to map out its atomic structure and determine whether a potential drug might bind with it is now a common path to drug discovery. In the late 1990s, crystallizing a protein could take months and even years. It was also a pricey process, since only the purest proteins will crystallize, and pure protein was expensive. Berkeley Lab's bioinstrumentation group was approached to create a solution.

DOE-FUNDED BASIC RESEARCH

DEVELOPMENT

Funded by \$500,000 to \$750,000 in grants from the lab, the researchers designed a nanodroplet protein crystallization robot. The nine-month project was completed in 1999. The new robot sped up the crystallization process by a factor of 10 and reduced the amount of pure protein used to a small fraction of that previously required.



DEPLOYMENT



Syrrx licensed the lab's technology in 2000. The company designed a series of robots to create an automated drug discovery system. Individual robots completed steps in the process, including extracting proteins, creating protein crystals, and collecting data from x-ray diffraction. The robots were used for Syrrx's work in discovering treatments for cancer and diabetes. Syrrx was acquired by Takeda Pharmaceuticals in 2005 for \$278 million. A drug Syrrx developed using the system, now named Nesina, received FDA approval in 2013 to treat type 2 diabetes.

INDUSTRY