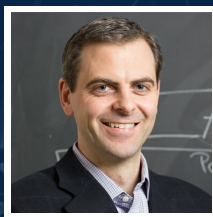


A 3D Printer for Molecules



Marty Burke
Professor, Chemistry

CURRENT RESEARCH

New medicines that operate as prostheses on the molecular scale

Many human diseases can be caused by missing proteins, including cystic fibrosis, asthma, anemia/thalassemia, cancer, atherosclerosis, neurodegenerative disorders, arthritis, and diabetes. Dr. Marty Burke, Professor of Chemistry at the University of Illinois, Urbana-Champaign is pioneering the development of a new class of medicines that treat such diseases by operating as prostheses on the molecular scale. His efforts to achieve this goal have revolutionized the way in which these and many other types of molecules can be made in the lab. Specifically, he has invented a 3D printer for molecules. This new machine can automatically make drug-like small molecules from simple Lego-like chemical building blocks. This new technology is powerfully enabling his teams' search for molecular prosthetics. More broadly, this technology stands to bring the power of making molecules to non-specialists and thereby revolutionize science, medicine, and technology.

Current research includes:

- "Molecular Prosthetics": Dr. Burke and his team target prosthetics on the molecular scale. Many diseases caused by too much protein function can be treated by small molecule drugs that bind to those proteins and turn them off. However, diseases alternatively caused by missing proteins cannot be treated using this classic approach, and thus most of these diseases remain incurable. He and his team are seeking to treat such diseases by developing small molecules that replicate the functions of the missing proteins, thereby operating as molecular prosthetics. Specifically, they are studying a series of naturally occurring small molecules that, after a billion years of evolution, already have the capacity to perform protein...

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AFFILIATION



University of Illinois Urbana-Champaign

EDUCATION

- B.A., in Chemistry, 1998 . Johns Hopkins University
- Ph.D., in Chemistry, 2003 . Harvard University
- M.D., 2005 , Harvard Medical School and MIT , 2005

AWARDS

- "One of the world's 35 top innovators under age 35" by Technology Review
- Kavli Foundation Emerging Leader in Chemistry Award
- American Chemical Society Elias J. Corey Award in Organic Synthesis
- Early Career Scientist Award from the Howard Hughes Medical Institute
- Hirata Gold Medal from Japan

RESEARCH AREAS

Life Science, Genomics / Congenital, Immunology / Inflammatory, Respiratory

FUNDING REQUEST

Your contributions will support the continued research of Dr. Marty Burke, at the University of Illinois, Urbana-Champaign, as he targets prosthetics at the molecular scale. Donations will fund the necessary \$1M/year budget required for the lab which supports personnel, reagents, equipment, and instruments. Additional donations will help Dr. Burke's team to enable projects that are not yet off the ground. In choosing to donate, you will play a role encouraging a new field of medicine and a powerful new technology, both of which have the potential for transformative impact on society.