

Novel Therapeutics for Malaria



Joachim Frank
Professor, Biochemistry and Molecular Biophysics

CURRENT RESEARCH

Targeting protein translation and developing ribosome-directed therapy for defeating malaria parasites

Malaria is an important global pathogen with 100-200 million infections per year, causing almost one million deaths – mostly in the pediatric population and pregnant women. The rates of resistance to all known antimalarials are rising across the globe, and there is an urgent need to develop new drugs for malaria. Drs. Joachim Frank, Professor of Biochemistry and Molecular Biophysics Columbia University, and Jeffrey Dvorin, Assistant Professor of Pediatrics at Harvard Medical School, combine their expertise to conduct a comprehensive study of protein synthesis in *Plasmodium falciparum*, the parasite responsible for the most severe forms of malaria in humans. Targeting protein translation and the ribosome in this parasite, the two collaborators hope that their research will lead to a precise design of more effective drugs against the disease.

There are currently very few groups looking at the protein synthesis machinery in these parasites or in other tropical parasites, and funding in this area of research is limited. Despite this, Drs. Frank and Dvorin have joined efforts to deliver solutions to global regions where highest technological advancements are most critical but there is less dedicated infrastructure to research. While Dr. Dvorin is an expert on the molecular and genetic pathogenesis of the malaria parasite, Dr. Frank is an expert on structural biology, specializing in 3D reconstruction and cryogenic electron microscopy, or cryo-EM, to probe the structure and function of ribosomes. Recent advances in instrumentation and computer software have made it possible to obtain near-atomic resolution of samples purified from the parasite with this technique, and together, Drs. Frank and Dvorin...

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AFFILIATION



Columbia University

EDUCATION

- Ph.D. in Biophysics 1970, Technical University of Munich, Germany, B.S. (Vordiplom) in Physics, University of Freiburg, Germany

AWARDS

- Franklin Gold Medal for the Life Sciences, 2014
- Elected to the Fellowship in the American Academy of Microbiology, 2006
- Elected to the National Academy of Sciences, 2006
- Elected to the American Academy of Arts and Sciences, 2006
- Elected Fellow of the American Association for the Advancement of Science, 1997

RESEARCH AREAS

Life Science, Pediatric, Infectious

FUNDING REQUEST

Your contributions will support the continued collaboration of Drs. Joachim Frank and Jeffrey Dvorin as they try to understand the structure of the protein synthesis machinery of malaria parasites to identify treatment targets. Your donations will help fund the combined \$200K/year for both labs to support personnel, supplies such as gold grids and liquid nitrogen, and reagents including enzymes, tissue culture materials, PCR, and sequencing. Partner with Drs. Frank and Dvorin to deliver effective malaria therapeutics to countries that need them most!