

## *Consortium on the Biology of Parasitic Diseases and Network on the Biology of Parasite Vectors*

### **Objectives**

Half the world's population suffers from parasitic diseases that lead to illness, disability, and death. Onchocerciasis, leishmaniasis, trypanosomiasis, schistosomiasis, filariasis, and malaria inflict a terrible burden on the world's poorest people, trapping them in a cycle of illness, poverty, and despair. Until recent years, however, parasitic diseases had received scant attention and little research funding, either in the U.S. or internationally.

In the early 1980s, the Foundation turned its attention to these enemies of human and economic development. It sought to strengthen the science underlying prevention by systematically applying the tools of molecular biology and genetics to parasitic diseases and the insects that transmit them.

### **Consortium on the Biology of Parasitic Diseases**

The first major grants, beginning in 1984, established the Consortium on the Biology of Parasitic Diseases. Researchers at 11 institutions worked together to establish and legitimize the field of molecular parasite biology by recruiting established cellular and molecular biologists, turning their technologies and experience to the study of parasites, and training the next generation of molecular parasite biologists. The Consortium's work was augmented by grants for equipment, problem-solving workshops, a summer course at the Marine Biological Laboratory at Woods Hole, and the World Health Organization's Special Programme for Research and Training in Tropical Diseases.

The Consortium did more than establish molecular parasite biology as a credible and exciting area of research. It also helped stimulate greatly increased funding for research in the field, especially by the federal National Institutes of Health, created a cadre of well-trained young researchers, and created a spectrum of new research tools and methods. It also identified the next field of opportunity for the Foundation: the study of parasite vectors.

### **Network on the Biology of Parasite Vectors**

A vector is the organism, such as an insect, that spreads a parasitic disease by transmitting a parasite from human host to human host. Mosquitoes, for example, transmit hundreds of millions of new cases of malaria and other parasitic diseases each year. Until recently, though, mosquitoes and similar vectors were viewed as little more than "flying syringes"; little was known about their molecular biology, their immune systems, or how they interact with disease-causing parasites.

In 1989 the Foundation established a network of research centers charged with building knowledge about the molecular biological and genetic bases of parasitic disease transmission by insects. Over the course of ten years, the Network transformed the field of research on parasitic diseases. For example, its members:

- Developed ground-breaking genetic methods for interrupting the transmission of vector-borne disease
- Developed the first methods for producing transgenic mosquitoes — that is, mosquitoes genetically engineered to be parasite resistant or incapable of transmitting vector-borne diseases
- Created the strategy for sequencing the genome of the most significant mosquito vector of human malaria
- Produced new knowledge about the insect immune system and molecular biology, and about the role of olfaction in host-seeking
- Trained hundreds of students, postdoctoral researchers, and faculty from around the world.

The Network's activities have leveraged funding far beyond the Foundation's original commitment. Largely as a result of the efforts of the individuals involved in the Network, there is now a strong and productive community of basic and applied researchers, interested funding agencies, and interventionists working in what had once been a neglected area of public health. Their work continues to make headlines — including breakthroughs in the prevention of malaria through genetic engineering — that trace back to the Network's original advances.

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