

THE C.A.R.E. FOUNDATION FUNDS MEDICAL RESEARCH

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Chair of the Scientific Advisory Board Research Committee

An important mission of the Cardiac Arrhythmias Research and Education (C.A.R.E.) Foundation is to fund research on cardiac electrophysiology and arrhythmias. The grant money is disbursed through a C.A.R.E. Foundation Career Development Award (CFCDA) to promising investigators working on mechanisms, therapy and the prevention of arrhythmias and sudden death. Four two-year awards have been distributed since the inception of the program in 1997.

Ronald A. Li, Ph.D. is the current and fourth CFCDA recipient. Dr. Li, a research associate of medicine at Johns Hopkins University's Cardiology department, is in his first year of the grant and will continue his studies in the molecular pharmacology of cardiac sodium channels through 2003. His mentor, C.A.R.E. Foundation Scientific Board member Eduardo Marban, M.D., indicates that Dr. Li would have been unable to continue his work with him if he had not obtained the CFCDA.

The third award went to supporting the work of David Charles Johns, Ph.D. at Johns Hopkins University's Institute for Molecular Cardiobiology. Dr. Johns conducted research on the mechanisms and treatment of cardiac arrhythmias and the prevention of sudden death due to heart rhythm disorders.

His work was directed at understanding the molecular mechanisms that underlie fatal cardiac arrhythmias. The approach taken was to genetically modify normal heart cells and cells isolated from animals with experimentally introduced heart failure to better understand the factors that lead to arrhythmias. Dr. Johns brought cutting-edge genetic technology to bear on the study of cardiac excitability. His work sheds new light not only on genetically-induced long QT syndrome, but on very common diseases, such as heart failure, in which patients frequently die of long QT-related arrhythmias.

Dr. Johns, while a Ph.D. student in the laboratory of Dr. Marban, applied two different genetic techniques to examine the role of specific ion channels more closely.

The use of recombinant adenoviral vectors allows the efficient genetic modification of adult cardiac myocytes. This technique involves removing some of the genes that these common cold viruses need to be infectious, and replacing them with ion channel genes. The custom-engineered viral particles can then efficiently deliver the ion channel genes to the heart cells, where they are translated into normal or mutant proteins. Dr. Johns has gone on to develop more than fifty different viruses which he pursued as part of the studies funded by this award.

The second award recipient was Dr. Mark E. Anderson of Vanderbilt University. His work addressed the issue of how the environment inside of heart cells can affect the generation of heart rhythm disturbances.

He studied mechanisms by which increased intracellular calcium provokes electrical currents which lead to life-threatening heart rhythm disturbances.

The recipient of the first award was Dr. Richard Gray at the University of Alabama, Birmingham. Dr. Gray's work addressed mechanisms of ventricular fibrillation and the strategies to terminate it. He studied the effects of defibrillating shocks and set up a video imaging laboratory to record from the cardiac surfaces of experimental models. He looked at the patterns of electrical waves in the fibrillating heart (spiral waves) and is determining whether specific patterns of electrical intervention are more effective in terminating fibrillation than are others. The benefit of this work will be to improve the design of strategies for defibrillation that would be more effective and efficient, and result in the ability for defibrillators to save more lives.

These brief summaries of the research performed by the four C.A.R.E. Foundation Career Development Award recipients show the scope of the work and the importance of the issues being addressed. Those who support the C.A.R.E. Foundation should know that their investment in research-dedicated resources has brought insight and progress to the prevention of and cure for life-threatening cardiac arrhythmias.

University of Miami School of Medicine Genetic Testing - Call for Participants

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