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Student Spotlight

Douglas Mata
Biochemistry and Cell Biology



Douglas Mata, a Biochemistry and Cell Biology major, is currently conducting thesis research under Dr. Yizhi Jane Tao. The research in the Tao lab focuses on the structures and replication strategies of RNA viruses. “After studying microbiology at the University of Science and Technology in Hong Kong, a region with a rich history of infectious diseases, I knew that I wanted to further my study of viruses here at Rice,” said Douglas.

Hong Kong has recently experienced outbreaks of RNA viruses such as influenza and severe acute respiratory syndrome (SARS). Douglas is currently working on a project related to the flu virus, specifically influenza type A, under the guidance of Dr. Qiaozhen Ye, a postdoctoral fellow in the Department of Biochemistry and Cell Biology. “We employ biochemical and biophysical methods such as protein expression, purification, and x-ray crystallography to clarify atomic-resolution structures of viral proteins. The quality of equipment available to the lab group is really quite amazing,” Douglas explained.

Douglas’s thesis centers upon determining the structure of the influenza virus nucleoprotein monomer. The nucleoprotein binds RNA, and is also involved in its stabilization and protection, in addition to other activities. “Elucidating the structure of the nucleoprotein will shed light on flu pathogenesis and may offer insight into the design of antiviral drugs, both important goals if the threat of avian flu, and yearly flu outbreaks in general, are to be successfully combated in the future,” he explained.



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Influenza kills over 30,000 people annually in the USA, and sickens many more. In 1918, a flu virus pandemic occurred, killing an estimated twenty percent of the world population. Flu viruses infect a wide variety of animals – humans, pigs, geese, ducks, and chickens. “This is why the flu will always be with us; it can’t be eradicated like polio because it will always have a reservoir in the wild” Douglas explained. “I’ve learned so much this year from Dr. Ye and Dr. Tao – doing a senior thesis has given me knowledge that I could have never gained in the classroom alone,” said Douglas, who is acknowledged in *Nature* for his work in the laboratory. Indeed, Douglas is no stranger to research, having previously conducted research into signaling pathways implicated in cancer and the neurobiology of cocaine addiction in other laboratories. Douglas also previously conducted ecological field work under Dr. Barry Sullender of the Rice Ecology and Evolutionary Biology Department in Bocas del Toro, Panama.

Douglas, a Rice/Baylor Medical Scholar, plans to defer matriculation to medical school in order to study abroad for an additional year: “I’m currently applying to one-year overseas graduate programs. Studying in Hong Kong made me realize the value of international collaboration. My career goal is to become a research-oriented physician with an emphasis on global health; studying abroad again will be a great way to do that.”

This document is also available on the Rice University Undergraduate Research Opportunities website, available at http://ugresearch.rice.edu/Student_detail.cfm?PID=2, as of November 15, 2006.