DRAFT RELEASE

Biology Professor Awarded Grant to Purchase Ion Proton DNA Sequencer for ECU

GREENVILLE, N.C. (April 10, 2014) — Dr. Edmund Stellwag, director of the East Carolina University Genomics Core Facility and Biotechnology Education Program and associate professor of biology, has received a North Carolina Biotechnology Center grant for the purchase of an Ion Proton DNA sequencer that will benefit collaborators from both East and West campuses.

An Ion Proton sequencer is an instrument that can sequence an extremely larger number of DNA bases very quickly. For example, the number of DNA bases in the genome of a human is approximately 3 billion. The sequencer can determine the sequence of this huge number of DNA bases in one day, which is a process that took years to complete when the human genome was first sequenced.

“I am very excited about getting a Next Generation high throughput DNA sequencer here at ECU, because it provides us with the necessary infrastructure to conduct very detailed genetic analysis that cannot be performed using traditional automated DNA sequencers,” said Stellwag. “This capability will help us understand the complex genetic changes that are involved in species evolution, organism function, embryonic development and in genetic and infectious disease.”

Scientists and faculty on both the East and West campuses of ECU will benefit from the new piece of equipment. According to Stellwag, the equipment’s flexible sequencing architecture is adaptable to many different sequencing applications. These include metagenomic studies, where a large assemblage of organisms can be sequenced simultaneously; comparative genomics, where sequences are prepared and compared from different species or individuals in a population; de novo sequencing, where new sequences are generated from organisms that have never been sequenced; or expression-based sequencing, where sequences are obtained from genes that are active in specific cells, tissues or organs.

“Faculty on both the East and West campuses are sequencing DNA on a daily basis,” said Stellwag. “They are especially interested in using the instrument to study gene expression in diverse organisms and cell types.”

An example of collaborative research between the two campuses is apparent in the research interests of Dr. Keith Keene (Department of Biology and Center for Health Disparities), who is interested in understanding the DNA sequence differences that predispose African-Americans to diseases like stroke, diabetes and coronary artery disease. He and his collaborators use genome-wide association studies that are dependent on the knowledge of DNA sequences from many individuals to help in identifying specific genetic variants that are linked to these disorders.
Stellwag’s own research will benefit from the new ion proton sequencer.

“My own research is focused on understanding the gene expression changes that occur during embryonic development,” said Stellwag. “We use high throughput DNA sequencing to analyze the changes in gene expression that occur during the development of tissue and organs from the fertilized egg through the early stages of embryogenesis. These changes in gene expression provide important information about which genes are important for the specification of each of the developing tissues and organs. They also provide clues concerning developmental defects that arise when these genes are expressed abnormally.”

Most recently, Stellwag’s laboratory work has focused on the effects of crude oil exposure on embryonic development. This research seeks to determine whether there are specific developmental defects that arise when embryos are exposed to crude oil during early stages of development.

“The ion proton sequencer is a revolutionary step forward for ECU’s genomics research community,” said Stellwag.

The university will order the sequencer within the next few weeks and hope to have it on campus within a month. Once it arrives, the equipment will be housed in the ECU Genomics Core Facility in the Howell Science Complex, a facility dedicated to DNA molecular analysis instruments. The facility provides genomics analysis resources for the entire ECU campus.

The North Carolina Biotechnology Center is a publicly funded organization that serves the community by providing information, grants, loans and other resources to facilitate the development of biotechnology in North Carolina. For more information about the center, visit www.ncbiotech.org.

For additional information about ECU’s acquisition of an Ion Proton DNA sequencer, contact Stellwag at 252-328-6302 or stellwage@ecu.edu.

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