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Establishing an Interdepartmental Fluorescent Microscopy Facility

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PACE UNIVERSITY

The Provost's Grants for the *Thinkfinity* Initiative for Innovative Teaching, Technology and Research Final Report

Title of Project: Establishing an Interdepartmental Fluorescent Microscopy Facility

Cornerstone III, Interdisciplinary Informatics

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Dr. David Zuzga (Dyson College of Arts and Sciences, Department of Biology and Health Sciences)
Dr. Nigel Yarlett (Dyson College of Arts and Sciences, Department of Chemistry and Physical Sciences)

December 15, 2012

A. *Project Goals:*

The specific goals for establishing the microscope facility were as follows: A) purchase an inverted fluorescent microscope; B) integration of the fluorescent microscope in faculty research programs; C) enhancement of the quality and productivity of faculty research and stimulation of interdisciplinary research collaborations; D) integration of the microscope into curricular student research experiences (BIO292, BIO480, CHE480); E) integration of the microscope into lab-based courses.

B. ***Progress:***

The main objective of the proposal, to purchase a fluorescent microscope, has been achieved. Goals B-D focus on the integration of the scope within faculty and student research and the overall enhancement of research quality. These objects have been achieved and the microscope has created experimental opportunities that were not previously available at Pace. To date, students and faculty have logged 194 hours of operating time on the microscope. Several students have presented data generated with the microscope at scientific meetings and conferences. Importantly, we anticipate continual expansion of the instrument's impact on both student and faculty research efforts over time. Realization of the final goal, integration of the microscope into lab-based courses, is anticipated to occur in Spring '12. Use of the microscope is planned for the laboratory sections of BIO335 (Molecular & Cellular Biology). Again, we believe the impact of the microscope on lab-based course will grow over time.

C. *Activities:*

Last Spring we acquired approximately $35,000 in additional funding towards the purchase of a microscope through Dyson College. Demonstration microscopes from Nikon and Olympus were previewed on campus. During the days these microscope were on campus two faculty members and ten students enrolled in either BIO292 or

BIO480 utilized the microscopes for their research. Following consideration of both instruments, a Nikon TE2000S microscope was purchased and was installed last June. A training session was held for faculty members over the summer. To date students and faculty have logged 194 hours of microscope use. The microscope has been widely used in the research program of Dr. Zuzga and Dr. Lampard, although the latter has since left the University.

D. Activities to be completed:

We are currently assembling an image library of data generated with the microscope. This compendium will be published online in an ePortfolio dedicated to microscopy at Pace. This activity is anticipated to occur over the summer.

E. Outcomes:

The following outcomes have been achieved through implementation of the grant.

I. Integration of the fluorescent microscope in faculty research programs

II. Enhancement of the quality and productivity of faculty research.

III. Integration of the microscope into curricular student research experiences (BIO292, BIO480, CHE480)

F. Class Creation:

No classes have been created.

G. *Student Impact:*

Notably, approximately 20 students enrolled in either BIO292, BIO480, or CHEM480 have worked with the microscope. Students have presented data generated with the microscope as several scientific conference and poster session including, *Eastern College Science Conference, 2011 (ECSC), the Department of Biology and Health Sciences Poster Session, 2011*, and the *Dyson Undergraduate Research Poster Session, 2011*. (Kristen Gulino, Zelda Mendelowitz, Claudia Slobolewski, *ECSC*; Jen Josephs, Catina Platel, *Biology Poster Session*; Kelsey Schroeder - *Dyson Poster Session*). We anticipate that during the current semester several students will present data generated with the microscope at the upcoming ECSC conference as well as the TriBeta Northeast District Convention. Additionally, students in BIO375 (Advanced Cell Biology) had the opportunity to examine cytoskeletal structure with the microscope during a portion of a class lecture period.

H. *Faculty Impact:*

Three faculty members, Kelly, Zuzga, & Lampard have been trained on the microscope. Dr. Lampard and Dr. Zuzga have generated experimental data with the instrument.

I. Unintended Outcomes:

There were no unintended outcomes.

J. *Conference Presentations:*

As detailed above, data generated with the microscope has been presented at several scientific conferences; *Eastern College Science Conference, 2011 (ECSC), the Department of Biology and Health Sciences Poster Session, 2011*, and the *Dyson Undergraduate Research Poster Session, 2011*.

K. *Expected and Actual Outcomes:*

The actual outcomes resulting from the installation of the microscope were precisely the outcomes originally anticipated.

L. Impact on Thinkfinity Cornerstone III:

The project has furthered Thinkfinity Cornerstone III by bringing a nearly ubiquitous technology that is central to the research of a broad range of scientific disciplines to Pace.. Therefore, the microscope serves as a catalyst for interdisciplinary collaboration.

M. *Sustainability:*

The microscope is fully paid for and requires a minimal investment of resources to maintain. We anticipate that the microscope will provide value to faculty and students for years to come.