

## **Development & Infusion of Course-Based Undergraduate Research Experiences (CUREs) into Introductory Core Courses of a Biology Curriculum**

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Undergraduate research experiences have been widely credited as an effective mechanism for enhancing the undergraduate experience (Lopatto, 2004), particularly the ability to enhance retention rates in undergraduate students (Gregerman et al, 1998). The Biology Department at North Carolina Central University (NCCU), with the support of Howard Hughes Medical Institute (HHMI), has created a mechanism for producing student success in introductory biology courses, especially since 30% of our students are first generation college educated and more than 80% have no prior research experience. We have achieved this through a multi- pronged mechanism: 1) integrating course-based undergraduate research experiences (CUREs) into the curricula; 2) using a modular format such that each course begins with a module on techniques and instrumentation, followed by a module incorporating authentic research; 3) establishing a scaffolding template for all 3 courses; and 4) utilizing undergraduate peer mentors to support faculty; 5) training new and current faculty in the development and delivery of research-infused curricula. Our model is currently being implemented in the first 3 core biology courses using yeast as a common organism with peer-led learning teams to enhance the teaching of laboratories. Starting from broad characterization of the living world around us and a study on clinically relevant yeast species (Biology I) to testing biochemical factors that affect yeast fermentation (Biology II) and a mechanistic look at yeast gene regulation in reaction to environmental chemicals (Biology III), students learn more knowledge and more advanced skill sets as they progress from lab to lab. These labs incorporate peer-led teaching and learning activities with a core group of undergraduate scholars, graduate students, postdoctoral fellows and professors. Our goal is to improve first year retention rates from Biology I to Biology III; help students better apply scientific concepts; and provide students with early exposure to basic research techniques.