A science education center at a university medical school had grant funding to develop a genetics curriculum unit but needed a dissemination plan. A statewide science teacher organization that provided professional development training was facing decreased funding. These two groups combined their efforts, and created a unique partnership, called BEGIN (Biotechnology, Ethics and Genetics Instructional Network) that has brought together university medical and science faculty and high school biology teachers. The main goal of this partnership is to provide high school biology teachers with new instructional tools to face the challenges of teaching genetics and bioethics in a manner that is content-rich, research and standards-based, and relevant to students' lives.

This article describes the BEGIN partnership and summarizes the tiered approach used for designing, pilot-testing, and disseminating a new problem-based learning (PBL) curriculum module on the bioethics of DNA testing for Huntington's disease. The article also provides some preliminary data on the effectiveness of this approach in transforming teacher practice.

BEGIN: A Unique Partnership Between University Faculty & Science Teachers

BEGIN was launched in 2003 using grant funding from the National Institutes of Health's National Human Genome Research Institute (NHGRI). This collaborative partnership brings together faculty and staff of the Life Sciences Learning Center (a hands-on science education laboratory located at the University of Rochester School of Medicine and Dentistry) and science educators from the New York State Biology-Chemistry Professional Development Network. The goal of this project is to develop and disseminate PBL-based activities that introduce high school students to the ethical, legal, and social implications (ELSI) of genetic testing. BEGIN focuses on curriculum and professional development, working primarily with high school teachers who teach biology courses based on the New York State Living Environment core curriculum (NYSED).

In order to increase the likelihood that teachers will adopt new curricula and instructional practices, BEGIN uses an ongoing, multi-year process of curriculum development and professional development with teachers from the New York State Biology-Chemistry Professional Development Network. The process introduces PBL and other instructional strategies that are based on current educational research on effective, best practices.

The centerpiece of the BEGIN partnership is a five-part PBL curriculum module called Family Secrets (Markowitz et al., 2006). This module engages students in constructing knowledge about DNA testing, Huntington’s disease, and the bioethics of genetic testing. Using PBL strategies, students access and interpret relevant scientific information and data, collaborate with other students, and develop ownership of their “solution” to a real-life problem. These skills are all key characteristics of science inquiry, and correlate with the inquiry skills found in the National Science Education Standards (NRC, 1996).

Family Secrets is the result of a three-year process of curriculum development, statewide pilot-testing, dissemination, and feedback. Family Secrets was created by a Development Team of master teachers from the New York State Biology-Chemistry Professional Development Network, and scientists, a pediatric geneticist, and a bioethicist from the University of Rochester. A group of ten biology Pilot Mentors from throughout New York State piloted-tested the initial version of Family Secrets in their classrooms, and provided year-long feedback to the Development Team. A revised version of Family Secrets was then introduced to 62 statewide Biology Mentors at a four-day summer institute at the University of Rochester Medical Center. Mentors field-tested the revised curriculum, and provided the Development Team with preliminary evaluation data to assess the impact of Family Secrets and the PBL process on classroom instruction and student learning. Mentors currently use the final version of Family Secrets, and provide the Development Team with data to study the impact of this PBL module on teacher instruction and student content knowledge.

Statewide Mentor Network for Professional Development

The Biology-Chemistry Professional Development Network is a statewide organization of approximately 60 biology and 35 chemistry teachers called “Mentors.” Created in 1991, the Network has been developing educational resources and providing high school science teachers and