

## **The Vanderbilt Center for Science Outreach**

The Vanderbilt Center for Science Outreach (CSO) has three principal programs in partnership with Metropolitan Nashville Public Schools (MNPS): the School for Science and Math at Vanderbilt (SSMV), the Scientist in the Classroom Partnership (SCP), and the Resident Science (RS) program. SEPA funding has supported components of all of these programs: in 2007, a SEPA grant provided start-up funds for the SSMV, with funding to sustain the program from MNPS, the university, and private donations. A SEPA grant in 2010 and a supplement in 2013 provided funding to adapt the SSMV program for implementation in local high schools, with subsequent development of preparatory programs in several elementary and middle schools. Funding was provided in both SEPA grants for SCP fellows to work alongside the scientists and teachers in both programs. In 2014, a supplement to the 2<sup>nd</sup> parent SEPA grant was awarded to initiate a pilot SSMV replication project at the University of Alabama at Birmingham (UAB).

Brief descriptions of these programs are as follows: 1) The SCP evolved from an original NSF GK-12 project funded in 2000, and is now in its 15<sup>th</sup> year of partnering graduate students and postdocs (fellows) with teachers in secondary STEM classrooms. The fellows co-teach for one full day per week for the entire academic year. Evaluation studies have demonstrated that fellows gain teaching and communication skills, teachers gain confidence in teaching science and gain STEM content knowledge, and students exhibit increased excitement about science. A current project now underway is the connection of this program with the Vanderbilt School of Education to create a novel K-12 licensure pathway for STEM PhDs. The SCP year will count as the practicum or student teaching for the fellows, with competencies built in to complete the licensure requirements. A partnership contract with MNPS has been executed to ensure that up to five of these newly certified PhDs will be hired each year. The partnership also includes PhDs who will participate in an NSF-funded Noyce grant in the School of Education, and PhDs who participate in an NIH-funded Broadening Experiences in Scientific Training (BEST) program through the Medical School.

2) The SSMV is a one-day pull-out program for highly talented MNPS high school students. A total of 104 students attend a rigorous, research-based elective taught by PhD scientists for one day on the Vanderbilt campus, with each class attending on a different day. Students have co-authored scientific papers, won national and regional science competitions (33 students have earned Siemens and Intel semi-finalist and regional finalist awards in the past five years), and have chosen STEM majors at prestigious colleges and universities at a higher rate than selective STEM schools. SEPA grants have provided funding for SCP fellows to participate in the SSMV.

3) The RS program places PhD and masters level scientists fulltime in K-12 schools to co-teach science electives, develop curriculum, and provide STEM content support for K-8 teachers. Most of the past and current resident scientists have participated in the SCP program, and several will enroll in the PhD licensure program in the next year.

Both the SCP and SSMV programs have been sustained and are now ready to spread to additional schools in MNPS and to districts outside Nashville. Two NSF ITEST grants have recently been submitted to replicate the SSMV at UAB, and to spread the SCP within MNPS school clusters by placing fellows in all grades in three high schools and the middle and elementary schools that feed into these high schools.

All of these programs intersect and synergize in important ways that partner scientists with K-12 students and provide important teaching, curriculum development, and classroom support opportunities for graduate students and postdoctoral fellows. The PhD certification program is linked to the SCP through both the Noyce and BEST programs; SCP fellows work in the SSMV and MNPS schools to assist resident scientists and to gain primary and secondary experience; PhDs will be intimately involved in the replication of the SSMV at UAB.