In December, 2013, during Dr. Ray Enke’s first year at JMU, 4-VA awarded him a mini-grant called Establishing a collaborative undergraduate research program: Characterizing epigenetic regulation of gene expression during development of the vertebrate retina. Launched as a collaboration to use a laser dissection microscope (LCM) at GMU, the project brought together three investigators with complementary areas of expertise. Dr. Enke focused on mechanisms of gene regulation in the vertebrate retina while Dr. Lance Liotta and Dr. Virginia Espina developed specialized techniques for analyzing retinal histology and laser capture microdissection of retinal tissue.

In 2014, access to the LCM allowed student Emily Grunwald to collect valuable tissue so the team could conduct experiments to demonstrate cell-specific patterns of epigenetic modification in the genomes of retinal neurons.

In December, 2014, 4-VA awarded Dr. Enke a second mini-grant called Gene expression analysis in the developing vertebrate retina using next generation sequencing to work with Dr. Stephen Turner at UVA. Complementing his first 4-VA project, this bioinformatics collaboration is focused on analyzing several large genome-wide sequencing data sets generated in his lab as well as previously published public domain data. The plan is to streamline bioinformatics protocols for students to use in the research lab as well as in upper division biology course labs.