SYED ALI, JAMES WALTERS*, *Dept. of Applied Science and Mathematics, Bluefield State College, Bluefield, WV 24701. Enhanced *in vivo* zebrafish larvae imaging using a novel micro-fluidic mounting technique.

Zebrafish (*Danio rerio*) is an excellent model organism for whole animal studies of metabolic disease. The larval zebrafish are optically transparent allowing for direct cell-level observation of physiological processes within living animals. Traditional methods of live-mounting zebrafish maintain larvae for only short durations preventing the in-depth analysis of organ processes. This project is to develop a novel microfluidic mounting technique for zebrafish larvae that extends survival and observation times. Attributes of an ideal micro-fluidic slide include: channels which allow media exchange, nourishment, drug delivery, and waste removal. We first determined a survival baseline of 20±7 minutes using the “lean-to” mounting method we previously developed. We then made a prototype using a Discotech Wafer Dicer and mounted 6 days post fertilization larvae. Larvae were placed under a coverslip and embryo media containing phenol red was used demonstrate show fluid exchange. Further testing included long duration larval mounting in this first prototype. We found that larval survival time increased 117±45 minutes. A subsequent prototype was made in collaboration with Marshall University’s, Molecular Biosensor and Imaging Center. SolidWorks was used for 3D modeling and a dolomite Fluidic Factory 3D printing system was used to print slides. We compared the three mounting techniques and determined the statistical significance of the difference between the mean durations with a students T-test. *Supported by NIH Grant P20GM103434 to the West Virginia IDeA Network for Biomedical Research Excellence*