EFFECT OF PRENATAL ALCOHOL EXPOSURE ON NERVES AND BLOOD VESSELS IN THE DEVELOPING HEART. Angela H. Zhu\*1 (azhu19@hb.edu), Nikhita Kumar\*1 (nkumar19@hb.edu), Yehe Liu2 (yxl448@case.edu), Michael W. Jenkins2 (michael.jenkins@case.edu), Michiko Watanabe2 (mxw13@case.edu). 1Hathaway Brown School, 19600 North Park Blvd, Shaker Heights, OH 44122. 2Department of Pediatrics, Case Western Reserve University, Cleveland, OH.

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When alcohol is consumed during early pregnancy, abnormalities in the embryo and the fetus may result from abnormalities of neural crest cell biology. The consequences, Fetal Alcohol Syndrome (FAS), persist as a major problem worldwide. The hypothesis tested is if alcohol damages neural crest cells, then their derivatives, the autonomic nervous system and smooth muscle cells around some coronary vessels, would develop abnormally. This may lead to arrhythmias and coronary anomalies that could impact morbidity and mortality.  Quail eggs were injected with alcohol to mimic a session of binge drinking early in pregnancy. The control eggs were injected with saline.  Both sets were incubated until embryos would normally form four chambered hearts with coronaries and autonomic innervation. The ethanol-exposed embryos had a 58.3% survival rate, while 83.3% of the control embryos survived. This data matches the survival rates of our previous experiments. To visualize cardiac innervation, hearts from surviving embryos were permeabilized with detergent, and an immunostaining technique was used to fluorescently label neuron-specific tubulin (TUJ1).  TUJ1stained nerves of ethanol-exposed embryos covered a smaller area of the heart surface and branched with more acute angles compared to hearts of control embryos. A novel technique, SLIME (Scatter labeled imaging of microvasculature in excised tissue) was used to detect coronaries. SLIME, a titanium-containing colloid solution, was injected into the aorta while vessels were visualized with optical coherence tomography during the filling of the coronaries. The sequence of vessel filling was atypical in ethanol-exposed quail embryos, indicating abnormal connections of the coronary vasculature.  The results suggest that early ethanol exposure mimicking early binge drinking during pregnancy leads to abnormal autonomic innervation and coronaries.