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**Identification of lines showing altered sensitivity to rewarding effects of nicotine using a self-administration assay in zebrafish**

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Addiction, including nicotine addiction, is one of the major mental health disorders and a leading cause of death in the world. Previous studies have shown the relevance of genetic factors responsible for a progression to abusive usage, with heritability for smoking estimated to stand at 0.5. Increased understanding of the genetics of smoking is necessary to identify novel drug targets and improve treatment. Here, we used a novel self-administration assay for juvenile fish to screen ENU-mutagenized zebrafish lines for nicotine seeking. The assay consists of 3 asymmetrically connected chambers with nicotine being administered to one of the chambers by diffusion from a point source thereby setting up a concentration gradient across the 3 chambers. Increased time spent in proximity to the nicotine source is taken as evidence of nicotine seeking behavior. We screened 54 families covering 3318 dominant and 1037 recessive alleles for nicotine seeking. Wild-type fish showed limited tendency to approach or avoid the nicotine source. However, 10 families of ENU mutagenized fish showed preference for, or aversion to, the nicotine chamber. Two of these families are predicted to house a dominant mutation affecting the behavior and 8 recessive mutations. Future work will assess the heritability of the observed phenotype and identify the pathways affected.