

Genetics Day Poster Submission

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**Category:** Graduate Student

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**Title:** TRMT1 IS NEEDED FOR TRNAS TO MAINTAIN THEIR FUNCTION WHICH HELP ORGANISM TO DEVELOP PROPERLY

**Abstract:** There are numerous post-transcriptional modifications are placed on transfer RNAs (tRNA) in all organisms. As one example, tRNA methyltransferase 1 (Trm1) is a tRNA modifying enzyme which methylates a guanine residue at position 26 to form dimethylguanosine (m<sup>2</sup>,2G). The human homolog of Trm1 is encoded by the tRNA methyltransferase 1 (TRMT1) gene. Our lab has previously shown that pathogenic variants in TRMT1 cause intellectual disabilities in the human population. However, the link between TRMT1 and downstream developmental pathways is unknown. I hypothesize that TRMT1-catalyzed modifications are needed for tRNAs to maintain their function in translation to ensure the synthesis of proteins required for proper development. To test this hypothesis, we will perform transcriptomics, ribosome profiling, and proteomics on wildtype or TRMT1-deficient human cells to dissect the contribution of TRMT1 in specific molecular processes. Overall, I will define the tRNAs, genes, and codons that are dependent upon TRMT1