

Due to advancements in RNA research, mi (micro) RNAs and other small nucleotide RNAs have become a major research field in biology including spaceflight research. The regulation of RNA transcription and processing by miRNAs makes miRNAs an appealing topic for genetics and molecular research. It has been estimated that over 60% of human gene transcripts are targets of miRNA regulation. In fact, this is true for all organisms, including plants and insects. Small nucleotide RNAs can also play a role in regulating gene expression, meaning that gene expression alone is not a complete picture of the potential genetic changes that occur in an organism during spaceflight. The goal of the WetLab-2 project is to isolate and recover miRNAs from various tissue sources on the International Space Station (ISS). No system currently exists that can isolate and recover small nucleotide RNA in space. However, the WetLab-2 system that was validated on the ISS in 2016 can be adapted to fit this purpose. We are currently testing the new modified protocols by running plant and mouse blood experiments in parallel, allowing us to demonstrate the effectiveness of the procedure on different sample types. We expect to be able to optimize and implement the modified miRNA protocols for use on future ISS flights.