**Role of MicroRNA Expression in Acute Myeloid Leukemia**

**Victoria Schopper**, Sara Meyer, Lee Grimes, Division of Immunobiology; Cincinnati Children’s Hospital Medical Center

Acute myelogenous leukemia (AML) is characterized by aberrant proliferation of abnormal myeloid progenitor cells and decreased production of normal blood cells in the bone marrow. Chromosomal abnormalities in AML create fusion oncoproteins that have been linked with upregulation of certain microRNAs (miRNA or miR) within different cytogenetic subtypes. miRNA are small, non-coding RNAs involved in the post-transcriptional regulation of gene expression via interaction with mRNA transcripts. miRNA repress gene expression via sequence complementarity with mRNA target sequence. miR-126 is overexpressed in patients with *AML1-ETO* fusion oncoproteins (t8;21) while miR-196b is over-expressed in patients with chromosomal rearrangements involving *MLL* (11q23). In order to better understand the role of miR-126 and miR-196b in AML, we used a luciferase assay to identify theregions of interaction between miRNA and target genes. Previous studies in our laboratory identified putative gene targets of these miRNA. We created plasmids with the luciferase reporter gene and a 22 base pair insert from the 3’ region of the putative mRNA targets containing the predicted miR binding sequence. We then transfected 293T cells with these plasmids and conducted a luciferase assay with the cell lysates. Thus far we find that miR-126 binds to and represses expression of luciferase reporter tethered to the target sites encoded within *PTPN9*, *HERPUD1*, *ROCK1*, and *MDM4*. Other potential targets for miR-126 and miR-196b with putative binding regions will be tested in the future, and the interaction of these miRNA and putative targets will be investigated with shRNA screens in mouse models of AML. Preliminary data from an ongoing shRNA screen with the miR196b targets *SAV1*and *PHC3* in the MLL-AF9 mouse model point to an acceleration of AML for the *SAV1* target model. Further investigation of the role of miR-126 and miR-196b in the development and maintenance of AML could lead to novel therapeutic agents.

**Acknowledgements**: This study was supported in part by NIH grants T35 DK 60444