

2015 Medical Student Summer Research Fellowship Program

Title: Epigenetic regulation of schizophrenia risk factors

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Research Project

Epigenetic modifications, including DNA methylation, histone modifications, and non-coding RNAs, have been implicated in a number of complex diseases. Schizophrenia and other major psychiatric and neurodevelopmental disorders are associated with abnormalities in multiple epigenetic mechanisms, resulting in altered gene expression during development and adulthood. Polymorphisms and copy number variants in schizophrenia risk genes contribute to the high heritability of the disease, but environmental factors that lead to epigenetic modifications may either reduce or exacerbate the expression of molecular and behavioral phenotypes associated with schizophrenia and related disorders. Our lab performs reverse translational research to better understand the role of epigenetic factors underlying disease pathology.

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Relevant publications:

Shorter, K.R. and Miller, B.H. (2014). Epigenetic Mechanisms in Schizophrenia. *Progress in Biophysics and Molecular Biology: Epigenetics* (in press)

Miller, B.H., Zeier, Z., Xi, L., Lanz, T.A., Deng, S., Strathmann, J., Willoughby, D., Kenny, P.J., Elsworth, J.D, Lawrence, M.S., Roth, R.R., Edbauer, D., Kleiman, R., Wahlestedt, C. (2012). MiR-132 dysregulation in schizophrenia has implications for both neurodevelopment and adult brain function. *Proceedings of the National Academy of Sciences*, 109(8):3125-30. PMC3286960.

Miller, B.H., Wahlestedt, C. (2010) MicroRNA dysregulation in psychiatric disorders. *Brain Research*, 1338: 88-99. PMC2891055.