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**Abra Brisbin\*** (Brisbin.Abra@mayo.edu), Harwick 7, Mayo Clinic, 200 First Street SW, Rochester, MN 55905, and **Liewei Wang** and **Brooke L. Fridley**. *Utilizing gene pathway-based priors in Bayesian association studies*. Preliminary report.

Gene pathways encode a wealth of information that could be used to improve power in genetic association studies. For example, researchers may wish to utilize the prior belief that more closely connected genes have more correlated effects on the trait. In this work, we explore a range of possible Bayesian models to encode gene network structure as prior knowledge in a study associating phenotype with the expression levels of genes in the network. We test our models on simulated datasets and make recommendations about the best model to use in various situations. We use our models to analyze the effects of gene expression on IC50 for gemcitabine and thiopurine pharmacogenomic studies. We find that NT5C3 plays an important role in increasing resistance to gemcitabine, and NT5E decreases resistance to mercaptopurine. (Received September 22, 2010)