

Meet Danielle M. Dick, Ph.D.



Danielle M. Dick, Ph.D., is an Associate Professor of Psychiatry, Psychology, and Human and Molecular Genetics.

Writer Sherry Wasilow interviewed Dr. Dick from her office in the Virginia Institute for Psychiatric and Behavioral Genetics at Virginia Commonwealth University.

SW: What is your current research focus?

DD: I am broadly interested in how genetic and environmental factors come together to impact the development of alcohol dependence and related problems. Because this is a very complex area, my research cuts across many different disciplines – ranging from psychology to genetics – and accordingly, my research includes many different types of projects.

SW: Describe the cross-disciplinary nature of your work.

DD: I am involved in big gene identification projects such as the Collaborative Study on the Genetics of Alcoholism (<http://zork.wustl.edu/niaaa/>), where we are working to identify specific genes involved in the predisposition to alcohol dependence.

I also work on population-based twin samples such as the Finnish twin studies (www.twinstudy.helsinki.fi/) in which we are studying questions such as how the importance of genetic and environmental influences changes across development, and how environmental risk factors, such as parental monitoring and home atmosphere, peers, and neighborhood influences, interact with genetic predispositions.

Finally, I'm involved in longitudinal studies such as the Child Development Project (<http://www.cdp.auburn.edu/>) that have studied children from early in development into young adulthood. We are genotyping these individuals for the genes that come out of the big gene identification projects in order to understand what kids who are carrying genotypes that have been associated with increased risk of adult alcohol dependence look like as they are growing up. This will help us understand how identified genes contribute to pathways

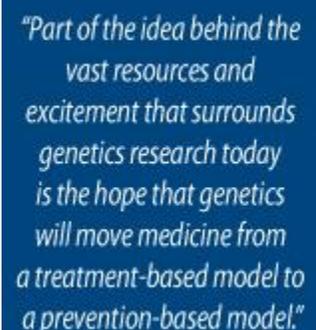
of risk across development, and how different environmental factors exacerbate or mitigate risk.

SW: How did you arrive at the current stage of your research?

DD: As an undergraduate at the University of Virginia (UVA), I took a class on abnormal psychology that focused on mental health and related disorders. I was fascinated by diseases related to the brain, as I realized just how little we knew about these conditions compared to most medical disorders and how much of a huge societal cost was associated with them. I switched my major from pre-med to psychology. During my fourth year at UVA, I volunteered on the psychiatric unit at the UVA hospital. I was struck and saddened by the revolving door aspect of mental-health treatment – that is, you see patients get better and then get worse and end up back on the psychiatric unit. It made me very interested in basic research. I felt like if I could understand the basic processes that lead up to the development of the disorder, I could help prevent these debilitating conditions and potentially improve people's lives.

SW: What are the day-to-day applications of your research?

DD: Part of the idea behind the vast resources and excitement that surrounds genetics research today is the hope that genetics will move medicine from a treatment-based model to a prevention-based model. We are all at risk for something – some of us are [just] more at risk for some disorders than others. Some people can drink socially without ever developing problems. For others, alcohol consumes and destroys their lives. Knowing an individual's risk for various problems can empower them to make choices to help avoid ever-developing problems. But in order to reach this promise, we need to know the genes involved in different disorders, and the environments that are critical in reducing (and/or exacerbating) risk among those who are susceptible, so that we can use this information to eventually develop more targeted and informed preventions and interventions. I hope my research is contributing to that effort.



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SW: What do you see as the future of genetics research?

DD: The field of genetics has changed rapidly over the last quarter century. The genetics that most of us learned in biology – focused on single gene disorders where genes were destiny and determined whether or not you had a disorder – is not the way that genetics works for alcohol dependence and most major health conditions. In addictions, we know that genes play a role, but there is no single "gene" for alcohol dependence. Rather, there are many genes – no one knows exactly how many, maybe hundreds! – each with a relatively small effect, that come together to create an individual's risk level for developing problems. But even still, genes are not destiny. No one is destined to become an alcoholic. Some people may be more or less likely to develop problems based on their inherent biology, but the environment still plays a critical role. Enhancing the public's understanding of probabilistic genetics – many genes, each with a small effect, and the critical role of the environment – will be critical if we are to bring our findings to the public and ultimately use this information to improve lives in the future.