

Investigating New Drug Treatments for Abnormal Heart Rhythms

Lisa Wren, Driskill Graduate Program in Life Sciences



Lisa Wren, a third-year student in the Driskill Graduate Program in Life Sciences (DGP) and the Masters of Clinical Investigation program, studies cardiac arrhythmia mechanisms in the laboratory of [Al George, MD](#), chair of the Department of [Pharmacology](#).

Wren earned her undergraduate degree from the Jackson State University in Jackson,

Miss. Her love for cardiovascular research began in high school and her goal is to become a cardiovascular research scientist who helps to bridge the communication disconnect between the medical community and the public.

Q&A

Where is your hometown?

I am from Florissant, Mo., in the St. Louis North County area. It's about 30 minutes north of downtown St. Louis.

What are your research interests?

Learning about the cardiovascular system was always my favorite topic in the health, human physiology and biomedical research classes that I took in high school. This interest drove me to my first research experience in the cardiovascular research field, and I have loved it ever since. When I completed my freshman year at Jackson State University, I started a research internship at Washington University in St. Louis and began to study cardiac ion channels. Through this experience I realized that I was more fascinated with the idea of studying the heart through research rather than the idea of becoming a clinician. I am interested in abnormal heart rhythms (arrhythmias) and the mechanisms responsible for causing them. I am also interested in how pharmacological agents can be used to treat some of these complex arrhythmia syndromes. Doing the experiments and collaborating with colleagues at research conferences in the field really ignites my interest.

What exciting research projects are you working on?

I work as a graduate student in the laboratory of [Al George, MD](#), chair of the Department of [Pharmacology](#), where I study cardiac arrhythmia mechanisms. It has recently been shown that mutations in calmodulin, a calcium sensing protein and

regulator of the cardiac conduction system, can induce very severe arrhythmias in infants and children, thus potentiating the risk of sudden cardiac death. Although there are three different calmodulin genes (*CALM1*, *CALM2*, and *CALM3*) that are translated into the exact same protein sequence, a point mutation in the *CALM1* gene may produce a different arrhythmia phenotype than if the same point mutation was introduced in the *CALM2* gene, for reasons yet unknown. Therefore, we seek to understand what drives one clinical arrhythmia phenotype over the other and to identify any potential modifiers that influence this genotype-phenotype relationship. This work may potentially explain new pathways that lead to abnormal heart rhythms, discover modifier genes that could reveal new therapeutic targets, establish models that can be used to investigate disease pathogenesis of those affected with calmodulin mutations and test new therapies.

What attracted you to the DGP?

I really liked the idea of interdisciplinary research. As a student, having the intellectual freedom and opportunity to collaborate with other labs across various disciplines is very attractive to me. I also liked that I was able to do a dual degree program to learn more about translational research. I am in the Masters of Clinical Investigation program as well and it adds a great clinical research perspective to the basic laboratory research that I do for the DGP. Northwestern also has some great mentors who are experts in their respective fields, so knowing that I would be trained by the best was definitely a deciding factor. I also did a post-baccalaureate program at the University of Chicago before I started graduate school, and I knew I wanted to stay in Chicago. There is always something for me to do here in the city, and I like having those options to explore.

What has been your best experience at Feinberg?

Some of my favorite experiences at Feinberg would probably be having the opportunities to travel with my principal investigator, Al George, to different research conferences that strongly focus on heart rhythm disorders. I was able to travel and present my research at the Heart Rhythm Society conference in San Francisco last May and recently at the Gordon Research Conference: Cardiac Arrhythmia Mechanisms conference in Ventura, Calif. It's such a great learning experience to attend seminars and network with leading experts in the field. Attending these conferences also exposes some areas of my training that I could focus on to strengthen my skills as a trainee. Being a young scientist, I also appreciate the opportunity to present my work and receive feedback from my peers.

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