



Diabetes: Clinical Trials & Basic Research

The Tulane Diabetes Research Program consists of the labs of **Vivian Fonseca** and **Franck Mauvias-Jarvis**. Working together, these two investigators study the mechanisms and treatments for a variety of the comorbidities associated with diabetes. Nationally and internationally recognized, this program covers all aspects of this increasingly common disease, from preclinical rodent studies, to research conducted in nonhuman primates, to a bevy of industry sponsored clinical trials. Additionally, this highly nimble and dynamic Tulane program maintains collaborations with a variety of internal and external partners, proof of their deep dedication to and experience with highly collaborative science.

Clinical Trials

Dr. Fonseca has been the site PI on over 100 clinical trials, with a consistent 3-4 per year being conducted at Tulane. Like all trials conducted at Tulane, they benefit from the ethnically and genetically diverse patient population that New Orleans and Tulane afford their resident investigators. Additionally, he has access to REACHNET, which contains EMR data from approximately 2 million patients from across the various medical and hospital systems within Louisiana. These trials typically focus on glucose control and the cardiovascular complications associated with diabetes.

The Fonseca lab has a particular interest in examining the unexpected results that can emerge from clinical trials and testing. Examples of these include: the connection between decreased blood glucose levels and decreased blood pressure, the effect of anti-inflammatory drugs on diabetes and heart disease, and the mechanisms behind the efficacy of chelation therapy in diabetes. This scientific and medical curiosity has led to a wide variety of collaborations in different areas of research expertise –both inside and outside of Tulane. The cooperative spirit of this Program makes it an appealing collaborator to all types of organizations: including large and small industry, academic entities, and foundations.

Diabetes Research Program

Basic Research: Sex Hormones and Diabetes

The Basic Research component of the Diabetes Program at Tulane is under the direction of Dr. Mauvais-Jarvis, who studies the interplay between diabetes and the sex hormones. Research conducted by the lab runs the full spectrum of the basic sciences in this area, including tissue culture and the use of both murine models and non-human primates. The ultimate goal is to identify and implement gender-specific treatments for diabetes.

The Mauvais-Jarvis lab studies how to use sex hormones fused to specific peptides to treat the metabolic complications of diabetes without increasing the patient's risk of cancer due to the increased hormone exposure. The lab uses hormones fused to peptides that have an affinity for specific receptors which are highly expressed only on cells relevant to the disease. This ensures that cell population that could be transformed by hormone treatment have limited exposure. For example, the lab is utilizing a GLP1-fused estrogen, which takes advantage of the high expression of the GLP1 receptor on islet cells and low of expression of this receptor in bone, breast, and reproductive tissue. This strategy confers the metabolic benefits of hormone treatment on women without an increased risk of estrogen-dependent cancer.

The lab is also involved in 1) a collaboration with a Tulane researcher to develop the next generation of peptides to fuse to sex hormones, 2) a clinical study examining the effects of novel estrogen receptor agonists in preventing metabolic syndrome in obese post-menopausal women, and 3) a VA-sponsored study examining the role of testosterone in diabetes, which is currently a field-wide area of great interest. Leveraged in tandem with the strong clinical trial history and infrastructure available to Tulane researchers, this basic research makes the Tulane Diabetes Research Program an ideal potential partner, able to provide the expertise and intellectual resources of a much larger program.

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