Tulane awarded $11.2 million NIH grant to pioneer sex-based precision medicine

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Dr. M.A. "Tonette" Krousel-Wood, the Jack Aron Chair in Primary Care Medicine and the director of the Center for Health Outcomes, Implementation and Community Engaged Sciences (CHOICES) at Tulane University, and Dr. Franck Mauvais-Jarvis, director of Tulane's Center of Excellence in Sex-Based Biology & Medicine, will use the grant to

investigate how differences in sex and gender can impact health outcomes and shape new treatments.

If a man and a woman each suffer a heart attack, you may assume the symptoms and diagnoses should be the same.

That's not always the case. While men are more likely to show the more "typical" signs of a heart attack — chest pains, shortness of breath — women are more likely to experience pain in their necks or symptoms that feel like heartburn or nausea. An angiogram that shows a blockage in male blood vessels may not show occlusion in a woman's smaller vessels, and these differences can lead to misdiagnoses or lack of treatment.

Tulane University has received a 5-year, $11.2 million grant from the National Institutes of Health to establish a Center of Biological Research Excellence (COBRE) in Sex-Based Precision Medicine. The center will explore the differences between biological sexes and genders, investigate how those differences can impact medical outcomes, and potentially help shape specialized treatments.

Principal investigators Dr. Franck Mauvais-Jarvis, professor of medicine and director of the Center of Excellence in Sex-Based Biology & Medicine at Tulane University, and Dr. M.A. "Tonette" Krousel-Wood, the Jack Aron Chair in Primary Care Medicine and the director of the Center for Health Outcomes, Implementation and Community Engaged Sciences (CHOICES) at Tulane University, will lead the center's efforts to examine the biological sex and gender differences in pursuit of more equitable medical treatments.

"Adult males and females are different patient populations; you cannot pool them together," Mauvais-Jarvis said. "They don't have the same heart attacks. Females are more likely to get autoimmune diseases like rheumatoid arthritis or lupus. The differences are not just due to testosterone and estrogen. There's something else."

The COBRE will fund a wide spectrum of innovative research involving investigators from across the university. This includes a first-of-its-kind investigation of how biological sex and estrogen impact pneumonia infections — and why women are more susceptible. Researchers will also work to engineer sex-specific, miniaturized models of human tissues and organs to study sex differences in diseases without the need for animal models.

“If you find a disease that is less common in females than males or vice versa, it means that one sex is protected, right? So if you can harness the biological forces that protect one sex compared to the other, well, then you have a therapeutic avenue for both sexes,” Mauvais-Jarvis said.

The grant will also allow the center to train a new generation of researchers and medical students in the concepts of sex-based precision medicine and how gender, which is a social construct, affects health and healthcare.

“This COBRE provides an excellent opportunity to build our capacity in Louisiana and beyond to advance the science of sex-based precision medicine, enabling the delivery of timely evidence-based treatment across sex and gender,” said Krousel-Wood, who is also a professor of medicine and epidemiology. “We will accomplish this by building a cadre of outstanding investigators as well as robust resources to support novel research that will translate into initiatives and treatments to improve human health across sex and gender.”

Historically, medical research studies were conducted primarily on males, resulting in clinical diagnoses that predominantly favor symptoms shown by men. While some medical guidelines have been updated in recent years to include symptoms shown in women, Mauvais-Jarvis said there is more work to do to understand just how different male and female bodies are. Importantly, the center will provide a platform for training and supporting research to identify underlying mechanisms for health disparities and providing critical insights from basic to population health research to optimize health equity across sex and gender, Krousel-Wood said.

“For the past century, the 170-pound man has been the representative of the human species, but if you treat all women according to a man’s biology, you will hurt them,” Mauvais-Jarvis said. “Our goal is to identify and harness these different biological forces to help us treat them equally.”