

Innovative research finds HIV patients at higher risk for blood clots

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Decades of research and treatment advances have helped extend the lives of many people living with HIV, but while these patients live longer, their risk of developing dangerous blood clots increases as much as tenfold. Blood clots—also known as thrombi—can wreak havoc on the body, causing events such as debilitating strokes and heart attacks.

"We have come so far to save these patients and improve their life expectancy, only to lose them to another disease," said Dr. Jeremy Wood, an assistant professor in Internal Medicine and the UK Gill Heart and Vascular Institute.

Wood is working in partnership with Sidney Whiteheart, a professor in Molecular and Cellular Biochemistry, Beth Garvy, chair of Microbiology, Immunology & Molecular Genetics and associate dean for Biomedical Education, and Dr. Thein Myint, an infectious disease specialist with UK HealthCare, on the first collaborative approach to understanding clot risk in patients with HIV in Kentucky. They hope the results will allow doctors to identify who is at the greatest risk of a clotting event, which could open the door to new treatment strategies.

The treatment of choice for HIV patients is antiretroviral therapy (ART), which is a cocktail of drugs that helps suppress the HIV virus and stop disease progression. The group wants to understand the mechanisms by which HIV infection and ART impact blood clotting proteins.

"We've learned that ART treatment does not reduce the risk of blood

clotting, which suggests that clots are not just related to viral load in HIV patients," Wood said. "Our goal is to identify what changes are caused by HIV virus and what changes are caused by ART treatment."

There are different factors that collectively cause blood clots, including platelets, white blood cells, and [plasma proteins](#) which, says Wood, can function as "good guys" or "bad guys," either increasing risk of clot formation or preventing the clot from getting too big.

In collaboration with Myint, associate professor in the UK Division of Infectious Diseases, the group is able to study blood samples from patients, in addition to looking at mechanisms with isolated platelets, white blood cells, and plasma. In doing so, Wood's laboratory has shown that about 60% of HIV patients have lower levels of protein S, one of the [blood](#) proteins that suppresses clotting. Since a deficiency in this protein has a strong correlation with the progression of HIV disease and with increased risk of [blood clots](#), and this deficiency seems to have contributors other than the HIV virus, the team's next step is to identify the mechanisms by which this deficiency occurs.

"This research is leading the way to bettering the lives of thousands of HIV patients across the Commonwealth of Kentucky," said Dr. Susan Smyth, director of the UK Gill Heart and Vascular Institute. "It's crucial that we continue to support these efforts, as the number of new HIV cases in Kentucky continues to rise. That's just one reason why Cardiovascular Research Day at UK is so important."

Martha Sim, a [graduate student](#) with Wood, will present their data at this week's Cardiovascular Research Day at UK on Friday, Sept. 20, in the UK Bill Gatton Student Center Ballroom. There will be 84 research posters at the event. Cardiovascular Research Day is one of the largest research symposiums in the Southeastern Conference. It's an opportunity to highlight important research taking place at UK.

"This research has the potential to improve patient care in multiple ways," Wood said. "In addition to helping patients with HIV, we believe we can apply the study results to other patient populations, as increased clotting risk is associated with many different viral infections."

Provided by University of Kentucky

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