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Case Western Reserve and Haima Therapeutics sign option license to develop SynthoPlate

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Nanoparticle technology mimics blood platelets to prevent and treat bleeding from trauma, surgery

Case Western Reserve University and Haima Therapeutics LLC, a Cleveland-based biotechnology company, have signed a two-year option to license a hemostatic nanotechnology, called SynthoPlate, to prevent and treat bleeding complications from trauma, low platelet counts and surgery.

More than 2 million units of platelets are transfused annually in the United States to treat such complications and various blood-related ailments.

However, natural platelet products, which depend entirely on human donors, suffer from many issues, including: limited supply, short shelf life (three to five days) due to a high risk of bacterial contamination, minimal portability, the need for blood typing/matching and potentially severe biologic side effects.

To address these issues, Anirban Sen Gupta, a professor in Case Western Reserve's Department of Biomedical Engineering, has spent nearly a decade developing synthetic nanoparticles that can mimic platelets' abilities to clot at the site of a bleeding injury.

The nanoparticles can be injected intravenously and potentially act as a platelet surrogate to prevent or treat bleeding when natural platelet products are unavailable or to reduce the need for donor platelet transfusion.

"Outside of large blood banks and trauma centers, platelet products are rarely available. It is an even bigger challenge to get donor platelets to our military in the field where heavy bleeding injuries are frequent," Sen Gupta said. "Our nanoparticle technology can be used in civilian and military scenarios of traumatic non-compressible bleeding where donor platelets are not readily available. This has been the motivation behind the research on platelet surrogates in my laboratory, and SynthoPlate is a technology that stemmed from it."

The two-year option to license agreement, managed through Case Western Reserve's Technology Transfer Office (TTO), will allow pre-clinical testing of the technology, including safety profiling and feasibility of scaled-up manufacturing.

"This technology has been well-positioned for translation through the support it has received from a number of our research grants," said Stephanie Weidenbecher, TTO's senior licensing manager.

"We are excited to work with Dr. Sen Gupta to advance this highly promising technology toward the clinic," said Christa Pawlowski, co-founder and chief scientific officer at Haima Therapeutics. "Our goal is to provide a product that can address the real, unmet needs of patients with bleeding complications."

Extensive lab testing and proof-of-concept studies in small and large animals has been funded by the Case-Coulter Translational Research Partnership, Council to Advance Human Health, Ohio Third Frontier Technology Validation and Start-up Fund and the National Institutes of Health's Center for Accelerated Innovation. Additional studies evaluating hemostatic effect and safety are ongoing in trauma models, funded by the U.S. Department of Defense.

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