

Breakthrough Research to Benefit Humans and Horseshoe Crabs

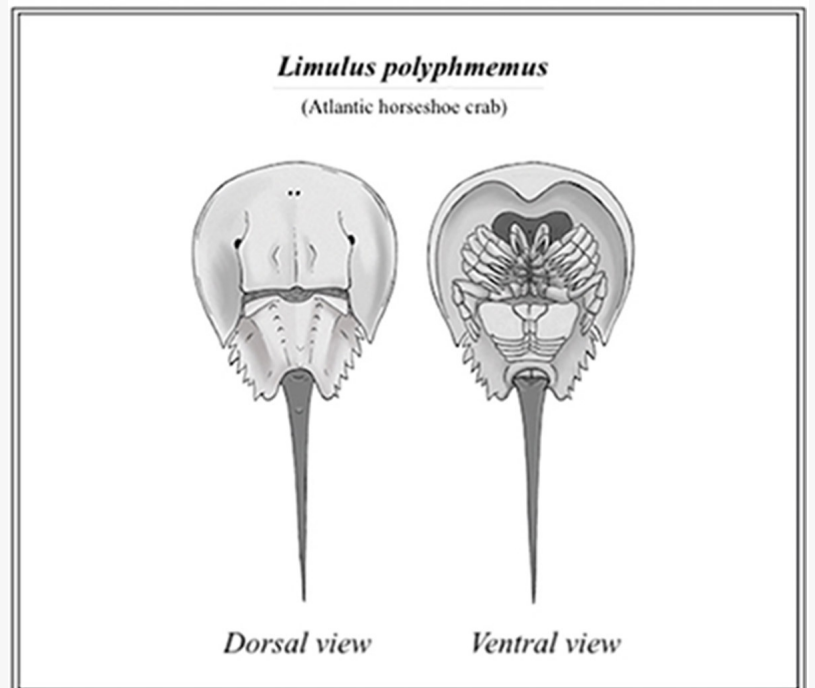
GREENSBORO, NORTH CAROLINA, US, October 29, 2020 /EINPresswire.com/ -- After studying the existing science as a North Carolina start-up, Kepley BioSystems focused on two objectives in 2018: First, to prove that horseshoe crabs could be sustainably husbanded in aquaculture, and second, that a meticulously harvested substrate from their blood could offer a breakthrough in clinical diagnostics. Both goals would require overcoming daunting barriers that faced earlier efforts while expanding on the established role of horseshoe crab "blue blood" for medical sterility testing.

Undeterred, the group concentrated on addressing the growing threats from antimicrobial resistance and sepsis – and from the annual biomedical industry capture of several hundred thousand horseshoe crabs from their habitats with up to 30% mortality. The former posed an increasingly urgent need for rapid testing for bacteremia with parts-per-trillion sensitivity in human medicine, and the latter required an alternative to current practices to help protect this ancient species while ensuring drug and device safety.

Kepley documented this research in



An Atlantic horseshoe crab (*Limulus polyphemus*) specimen from the Kepley aquaculture facility in North Carolina.



To date, the Kepley team has reported on their work in four articles in the *Frontiers in Marine Science* research journal.

four articles, with the final two publications today and last week. From a far-reaching assessment of the study of horseshoe crabs to date, the group went on to prove novel approaches to feeding them and ensuring their wellbeing, while developing low-impact harvesting protocols for sustainable aquaculture. This alternative to wild capture could help secure the vital resource on which millions of patients depend for sterile, safe implantable medical devices and injectable drugs every year. It could also help ensure ample test supplies for a breakthrough in rapid patient screening to guide timely treatment of bacterial and fungal infections – and mitigate the risks of antimicrobial resistance when treating septicemia.

The first two publications made important contributions to the literature and spanned many disciplines, including: aquaculture, animal feed, infectious disease, diagnostic medicine, and ecology. And the last two round out the specifics with respect to sustainable husbandry, promising disruptive ecological and clinical benefits.

Since the inception of the pandemic, an area of particular interest has been coinfections leading to bacterial sepsis in the management COVID-19 patients with viral pneumonia, especially when blood culturing is impracticable. It has also been widely reported that sterility testing of SARS-CoV-2 vaccines could intensify pressures that further threaten the horseshoe crab viability as a species.

Kepley BioSystems horseshoe crab research has been generously supported by the National Science Foundation and the NC Sea Grant Agency, to date. The company is seeking investors and commercialization partners in diagnostics, aquaculture and agricultural feedstocks.

These publications are listed below for further reference and may be accessed at:

www.KepleyBioSystems.com/HSCpublications

HUSBANDRY: Effects of Diet on the Biochemical Properties of Limulus Amebocyte Lysate From Horseshoe Crabs in an Aquaculture Setting. *Frontiers in Marine Science*. 7:541604. doi: 10.3389/fmars.2020.541604. (2020)

Read online: www.frontiersin.org/articles/10.3389/fmars.2020.541604/full

IDEAL CONDITIONS: Evaluation of Indoor and Outdoor Aquaculture Systems as Alternatives to Harvesting Hemolymph From Random Wild Capture of Horseshoe Crabs. *Frontiers in Marine Science*. 7:568628. doi: 10.3389/fmars.2020.568628. (2020)

Read online: www.frontiersin.org/articles/10.3389/fmars.2020.568628/full

PROOF OF PRINCIPAL: Horseshoe Crab Aquaculture as a Sustainable Endotoxin Testing Source. *Frontiers in Marine Science*. 7:153. doi: 10.3389/fmars.2020.00153. (2020)

Read online: www.frontiersin.org/articles/10.3389/fmars.2020.00153/full

ORIGINAL REVIEW ARTICLE: The Role of Horseshoe Crabs in the Biomedical Industry and Recent Trends Impacting Species Sustainability. *Frontiers in Marine Science*. 5:185. doi:

10.3389/fmars.2018.00185. (2018)

Read online: www.frontiersin.org/articles/10.3389/fmars.2018.00185/full

About Kepley BioSystems:

Kepley BioSystems is a North Carolina-based life sciences biotech operating out of Gateway Research Park (GRP) in collaboration with the Joint School of Nanoscience and Nanoengineering (JSNN), comprised of a partnership between the North Carolina Agriculture and Technical State University (NCA&T) and the University of North Carolina at Greensboro (UNCG). Kepley BioSystems was founded in 2013 with a mission to emerge disruptive innovations to achieve global solutions. Having been primarily grant-funded to date, Kepley is seeking commercial partners and/or equity investors to help realize its full potential in multi-billion dollar markets across the company's project portfolio. For more information, visit:

<http://www.kepleybiosystems.com/>

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