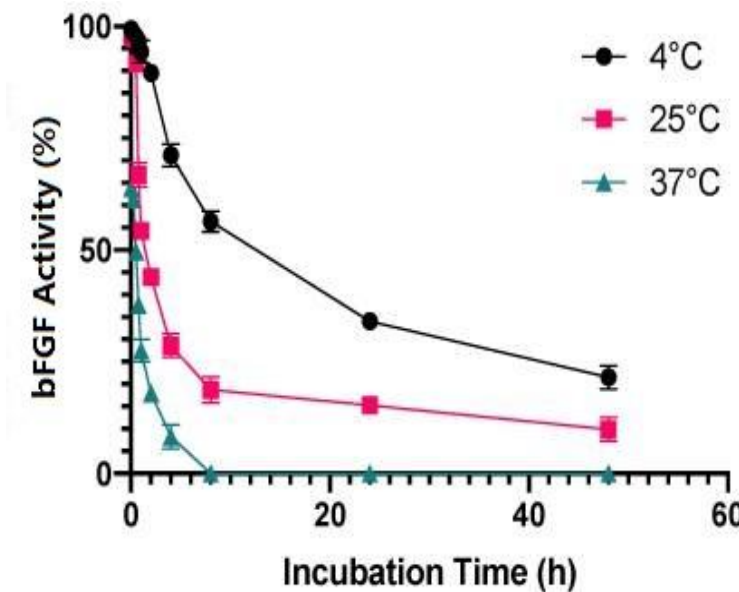


Phycin UltraStable bFGF™ for Regenerative Medicine and Beyond

Satarupa Bhaduri, Marina Grossi, Tianqi Guo and Jun Wang

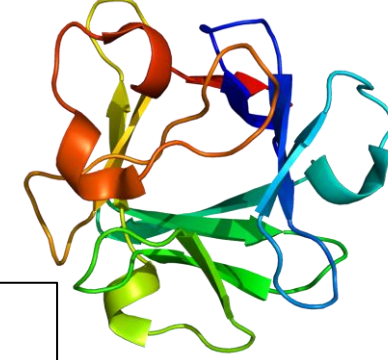
Why Basic Fibroblast Growth Factor (bFGF) Needs an Upgrade?

bFGF is one of the most widely used growth factors used in regenerative medicine. bFGF can enhance corneal and skin wound healing, as well as closure of blast induced tympanic membrane perforation.



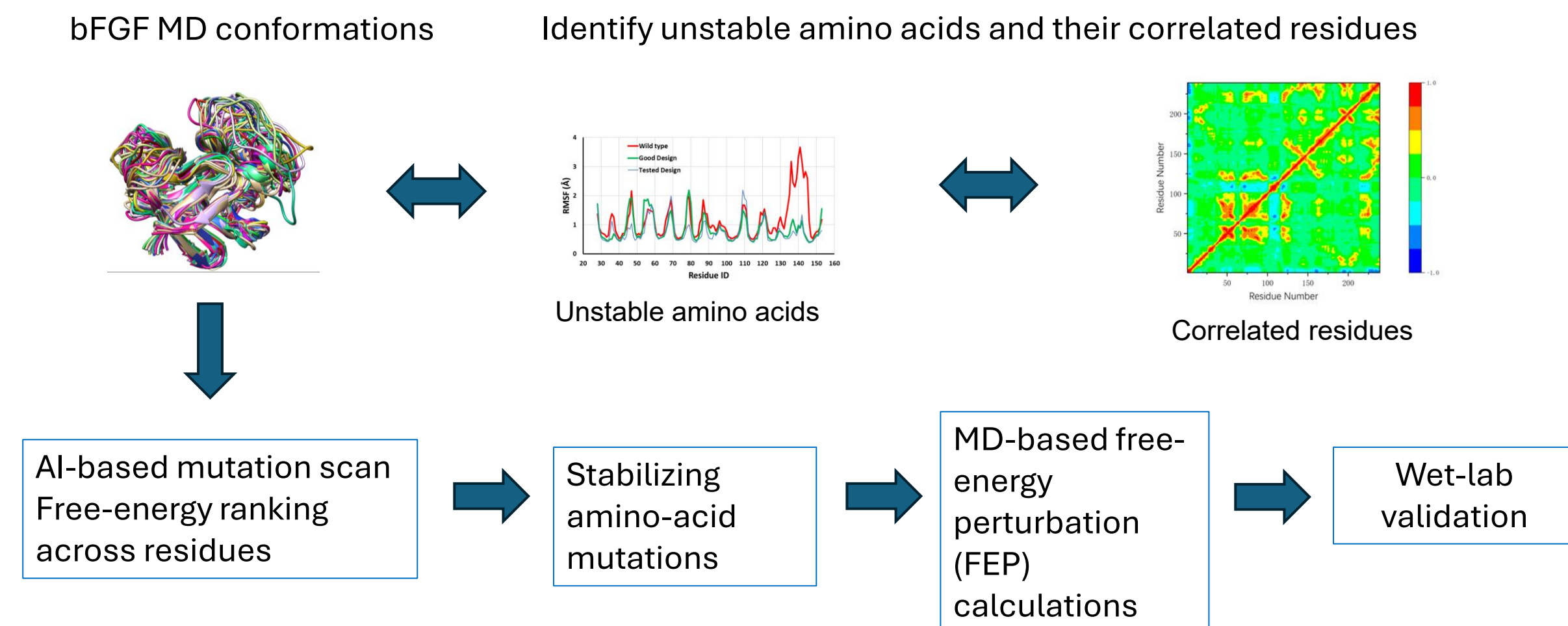
Challenges with bFGF production:

- Unstable, expensive, and cold-chain-dependent
- Higher dosing, shorter usable life, and higher susceptibility to wound site proteases
- Potential biosafety concerns with endotoxin and viral contamination from bacterial and mammalian production sources

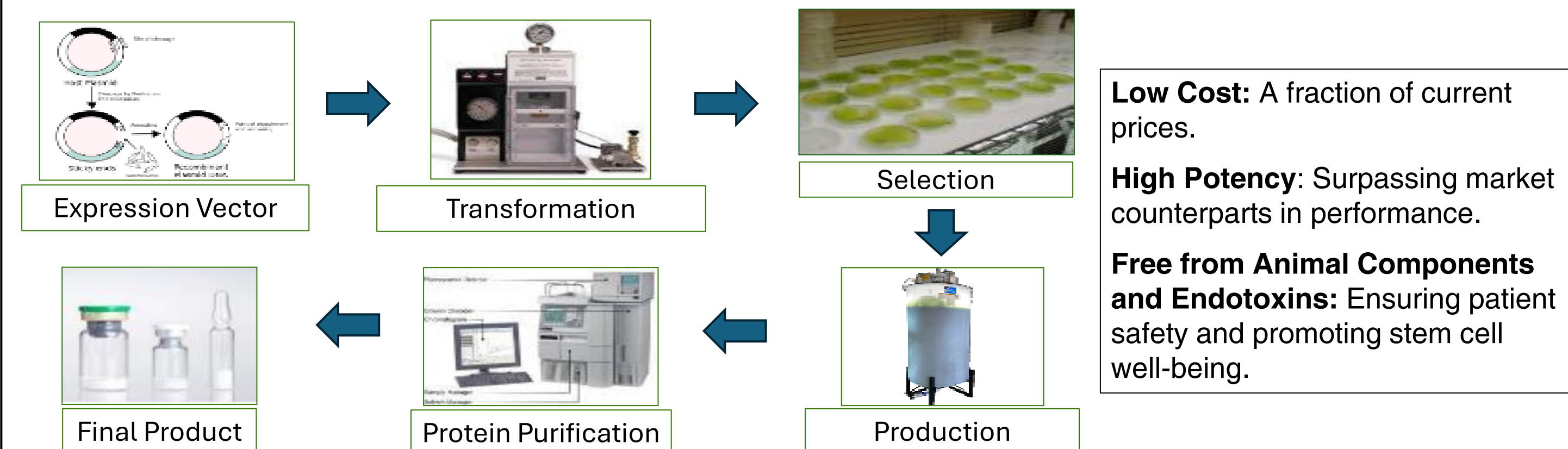


Phycin's Technology Platforms to Engineer Stable Growth Factors

AI + Molecular-Dynamics (FEP) Pipeline to Engineer Superior bFGF



SynBio-Enabled Algae Production Platform

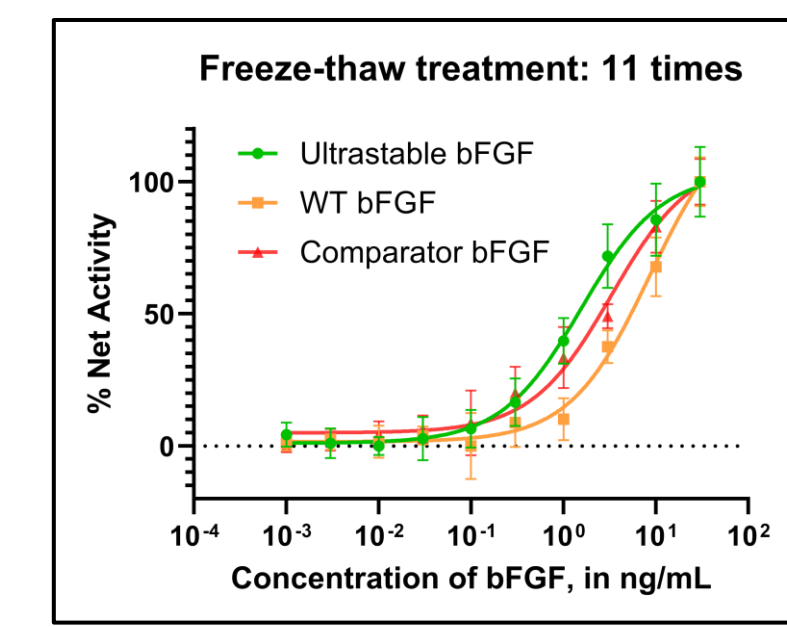
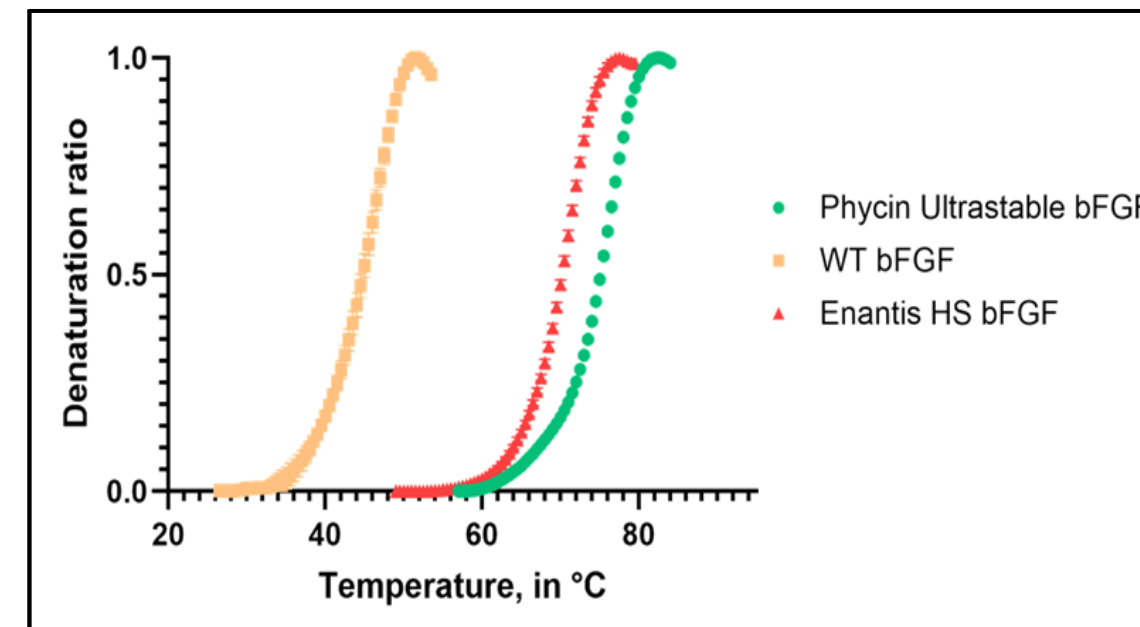


Funding and Collaboration

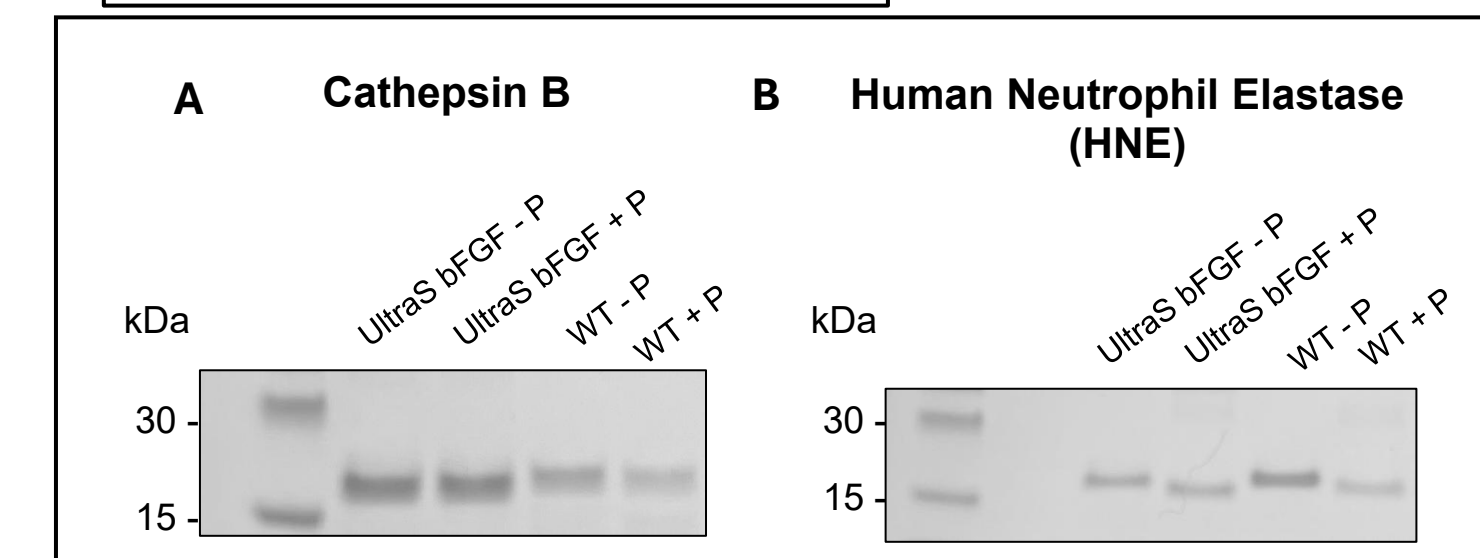
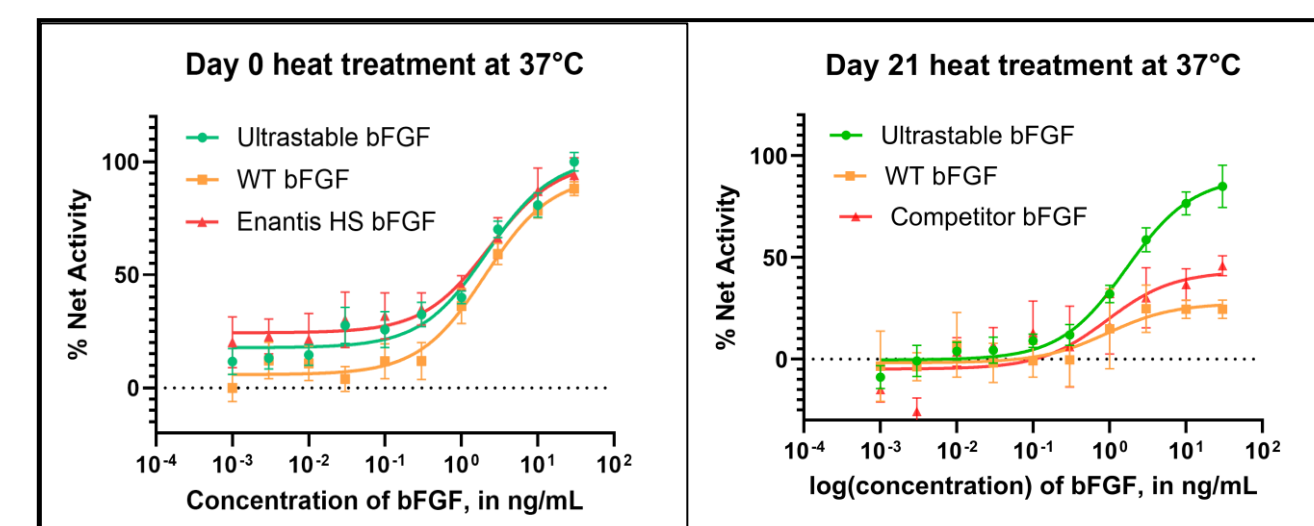
ACKNOWLEDGEMENT: Effort sponsored by the Government through the Medical Technology Enterprise Consortium (MTEC) under Other Transaction Number W81XWH-15-9-0001
DISCLAIMER: The views and conclusions contained herein are those of the authors and should not be interpreted as necessarily representing the official policies or endorsements, either expressed or implied, of the U.S. Government.



UltraStable bFGF™ Shows Enhanced Thermostability, Protease Resistance and Potency



1. Higher thermostability
2. Higher resistance to physiological wound site proteases
3. Retains function after prolonged heat exposure, as measured by 3T3 cell proliferation activity assay
4. Retains robust activity after multiple freeze-thaw cycles



Preclinical Studies: Accelerating Discovery and Therapy Development

Phycin stable bFGF accelerated the closure of blast induced tympanic membrane perforation



Phycin stable bFGF accelerated corneal re-epithelialization and closure of in-situ skin wound injury



Future Directions and Relevance to DoW

Looking ahead:

- Test UltraStable bFGF to develop a first-in-class ear drop for the treatment of blast induced TM injuries.
- Test UltraStable bFGF in the treatment regimen in to counteract mechanical and chemical injuries in human corneal organoids and larger animals to validate its application in human ocular diseases.
- Test UltraStable growth factor to develop skin ointment against epithelial injuries.

Relevance:

- Valuable tool for military medical personnel to treat ocular, ear and skin injuries.
- UltraStable bFGF and other stable GFs in the pipeline, can serve as innovative therapies to potentially reduce the number of service members who leave the military and improve overall health and well-being, as well as that of civilians.