

# Smart Biomaterials for Personalized Medicine

## Bioprinted Wound Dressings and Skin Substitutes

- Biomimetic artificial skin and wound dressings for scarless wound healing

## Stimuli-Responsive Transdermal Drug Delivery Systems

- Reusable stimuli-responsive devices with extended operational time
- Smart theragnostic tools with multi-modal sensors and AI-powered decision-makers

## AI-Powered Wound Diagnostic Tools

- AI-powered multi-modal sensors for tissue segmentation and volumetric mapping of chronic wounds
- Medical digital twins

## Space Health and Bioastronautics

- Effect of microgravity and harsh condition on tissue regeneration, immune response, and angiogenesis

## Contact Information:

### Fateme (Sha) Fayyazbakhsh

Assistant Professor

Department of Mechanical & Aerospace Engineering

Joint Appointment at Linda & Bipin Doshi

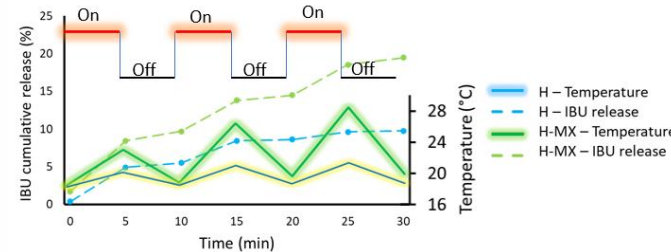
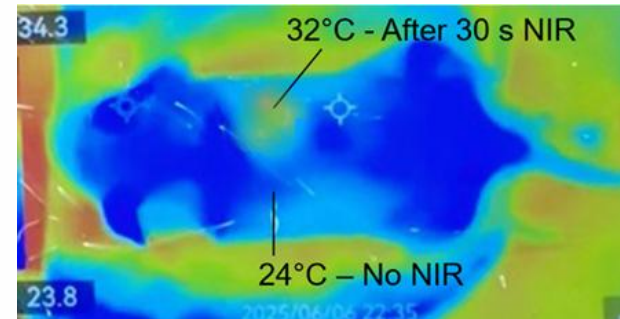
Department of Chemical & Biochemical Engineering

[f.fba@mst.edu](mailto:f.fba@mst.edu)

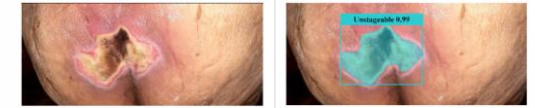
(573)341-4105

### Funding

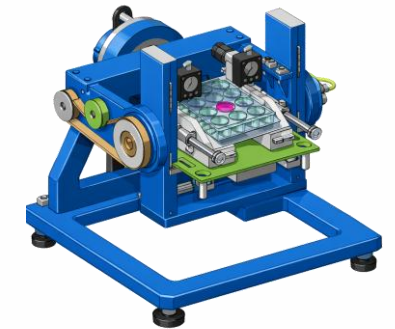
- NSF STTR and CFIRE
- NIH SEED MBarC



Smart drug delivery system: NIR-responsive Hydrogel-MXene systems for on-demand ibuprofen release



AI-enabled wound monitoring



Effect of altered gravity on tissue response and biosensor performance for personalized space care

## Keywords

- #Smart\_biomaterials #Bioprinting #Wound\_healing #Drug\_delivery\_systems #AI\_diagnostics

## Recognitions

- People Choice Award – Equalize pitch event in MedTech 2025
- BioKansas Innovation Festival Finalist 2023
- Tissue Engineering and Regenerative Medicine (TERMIS) Young Investigator Award 2020