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Office of Technology Management

PEPTIDE FUNCTIONALIZED VISCOELASTIC HYDROGELS FOR SCALABLE HIPSC CARDIAC DIFFERENTIATION

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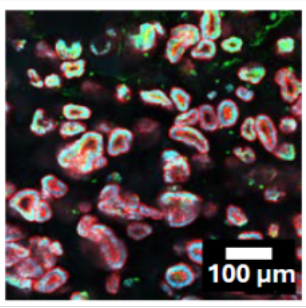
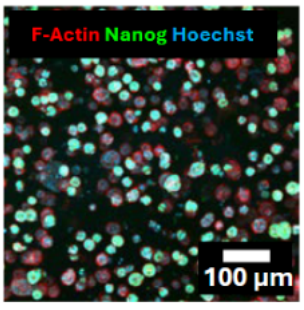
Value Proposition: Hydrogel platform that enables scalable production of cardiomyocytes

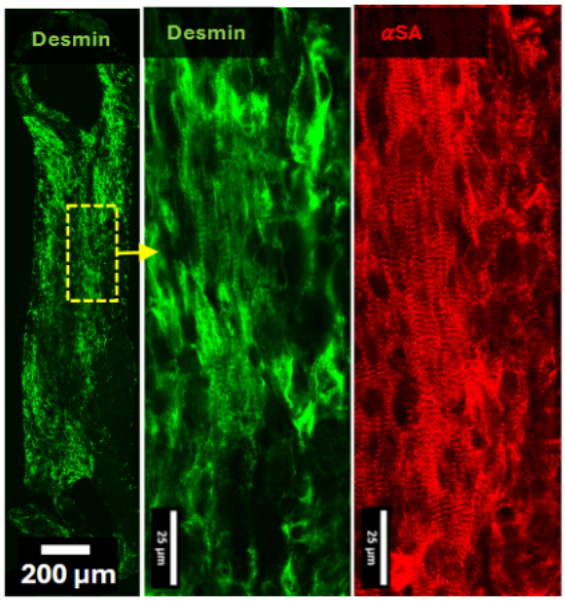
Technology Description

Researchers at Washington University in St. Louis have developed a chemically defined, tunable hydrogel platform that improves the production of human induced pluripotent stem cell-derived cardiomyocytes (hiPSC-CMs). While hiPSC-CMs provide a unique opportunity to recapitulate human cellular disease phenotypes, they have high user-dependence and poor reproducibility.

Preliminary method optimization within the platform has been conducted where an optimal hydrogel composition (bottom left, in contrast to a different composition in top left) can consistently increase mature hiPSCs, which results in structurally mature cardiomyocytes as shown via striated desmin and alpha-sarcomeric actin organization (right).







Publications

Available on request

Applications

- Disease modeling
- Drug screening
- Regenerative medicine
- 3D Bioprinting

Key Advantages

- Improved differentiation efficiency and structural and functional maturation
- Lowered variability compared to conventional 2D or suspension methods
- Can produce high cell counts

Patents

Patent application filed

Related Web Links – Nathaniel Huebsch Profile & Lab