

Silicone Hydrogel Support Structures that Mimic Tissue Vasculature for Cell Culturing

Summary (1024-character limit)

Photolithographic methods are used to construct mimetic silicone hydrogel pillars that have, for example, a 20:1 height to diameter ratio.

NIH Reference Number

E-070-2013

Product Type

- Devices
- Diagnostics

Keywords

- Silicone Hydrogel, Tissue Grafting, Tissue Engineering, Oxygen Diffusivity

Collaboration Opportunity

This invention is available for licensing and co-development.

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Description of Technology

Researchers at the National Cancer Institute developed silicone hydrogel support structures that mimic tissue vasculature (e.g., capillary bed) with high oxygen diffusivity. Photolithographic methods are used to construct mimetic silicone hydrogel pillars that have, for example, a 20:1 height to diameter ratio. Advantageously, these mimetic silicone hydrogels diffuse oxygen from the bottom chamber to the cells cultured on the surface at near physiological rates (60 times that of water). Uses of these mimetics include 2-D screening for chemotherapeutic compounds and growth of tissue for grafting.

Potential Commercial Applications

- Tissue engineering
- Simulation of physiological growth conditions

Competitive Advantages

- High oxygen diffusivity

Inventor(s)

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Development Stage

- Prototype

Publications

Jaeger AA, et al. [[PMID 23911071](#)]

Patent Status

- **U.S. Provisional:** U.S. Provisional Patent Application Number 61/758,198
- **U.S. Provisional:** U.S. Provisional Patent Application Number 61/773,064
- **U.S. Patent Filed:** U.S. Patent Application Number 14/166,744

Therapeutic Area

- Cancer/Neoplasm
- Cardiovascular Systems
- Eye and Ear, Nose & Throat
- Gastrointestinal
- Hormonal Systems, Endocrine, and Metabolic Diseases
- Kidney and the Genitourinary
- Musculoskeletal
- Reproductive
- Skin and Subcutaneous Tissue