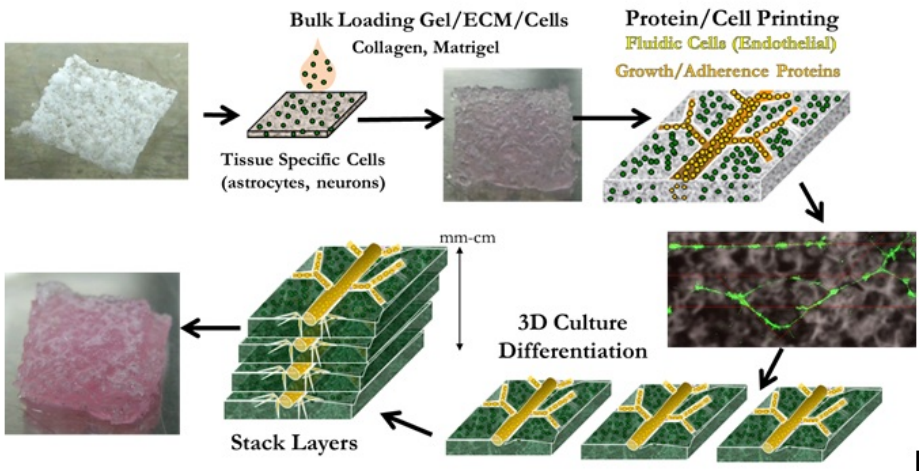
NAVAL RESEARCH LABORATORY

TECHNOLOGY LICENSING OPPORTUNITY

CELL AND BIOFACTOR PRINTABLE BIOPAPERS



The Naval Research Laboratory (NRL) has developed thin polymer/hydrogel scaffold sheets, or 'biopapers', which act as substrates for cell and biofactor printing. The patented NRL technique uses these biopapers as mechanically stable sheets to be used in a cell printing apparatus. Each polymer sheet can be addressed with different growth factors and then loaded into a cell printer for patterned cell seeding. After printing, the biopapers can be cultured to achieve the desired level of cell differentiation (e.g., vasculature formation) and/or tissue formation. They are strong enough that they can then be physically stacked into three dimensional structures.By printing multiple cell types in a defined pattern on each sheet, culturing, and then stacking the sheets, these biopapers can be used to enable heterogeneous tissue structures to be created in 3D including structures needed for prevascularization of tissue constructs and unique, high resolution, *in vitro* 3D cell culture models.

References

"PLGA/Hydrogel Biopapers as a Stackable Substrate for Printing HUVEC Networks via BioLP™" *Biotechnology and Bioengineering*, doi: 10.1002/bit.23295

Available for License: US Patent Publication No. 2011-0269207

Advantages/Features

Biodegradable

Tunable pore size, elasticity, degradation, and mechanical properties (soft and hard tissues)

Micro-alignment for high resolution inter-layer registration of printed structures

Provides scaffolding for low volume print applications

Applications

Regenerative medicine

In-vitro model tissues for drug testing, bioreactors, and biomolecular production

Preformed cell culture substrates for biological research, including 3D conformal cell printing (e.g. NRL's patented BioLP™, inkjet, laser-induced forward transfer)

For more information contact:

Rita Manak, Ph.D.
Head, Technology Transfer Office

202 767-3083

rita.manak@nrl.navy.mil

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