



MIMETIX
CELLS IN 3D

The Electrospinning Company

Overview
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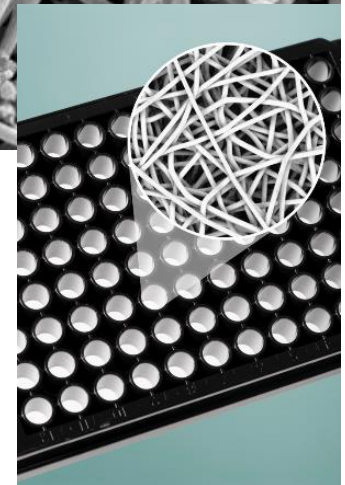
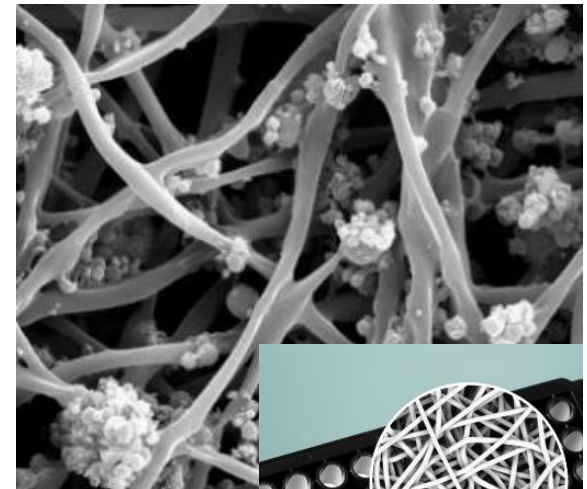


ELECTROSPINNING
COMPANY

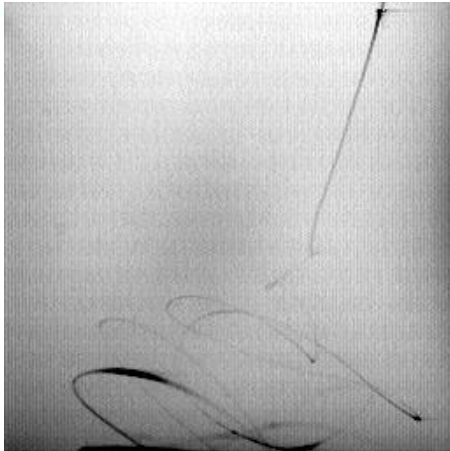


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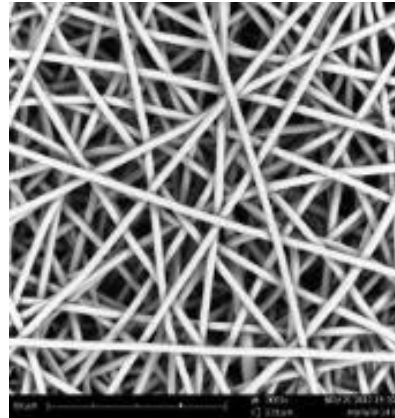
- UK SME
- Design, develop and manufacture advanced biomaterial scaffolds
- Sales of product and service
- R&D collaborations supported by EU and UK grants
- ISO 13485 medical device quality certification



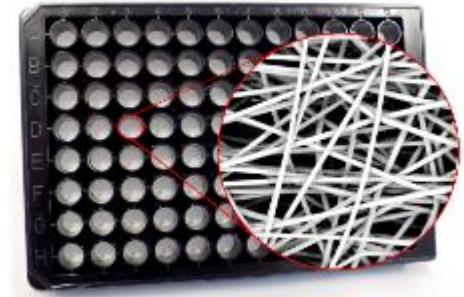
What we do



Electrospinning of polymers



Scaffolds for '*in vivo*-like' 3D cell culture



Tools for cell-based assays



Implantable materials

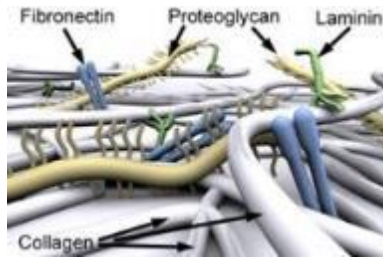


Bioreactor inserts

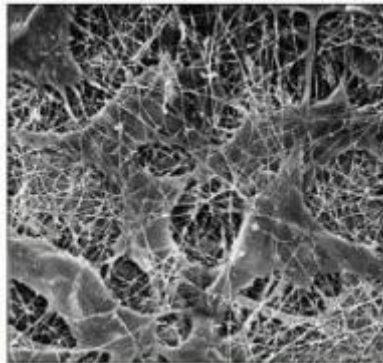


Electrospun Scaffold Resembles Extracellular Matrix

Extracellular matrix

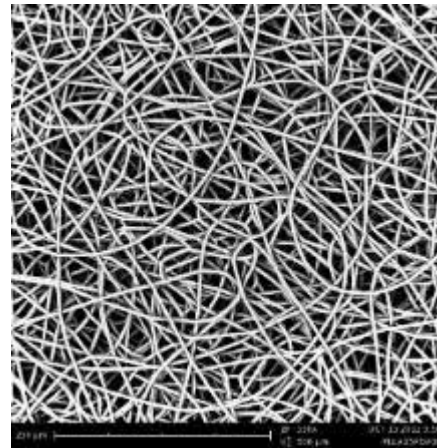


schematic



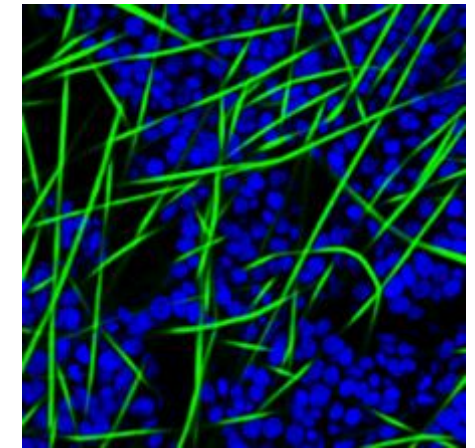
natural

T. Nishida et al., Invest. Ophthalmol. Vis. Sci. 29, 1887–1890, 1988.



Mimetix scaffold

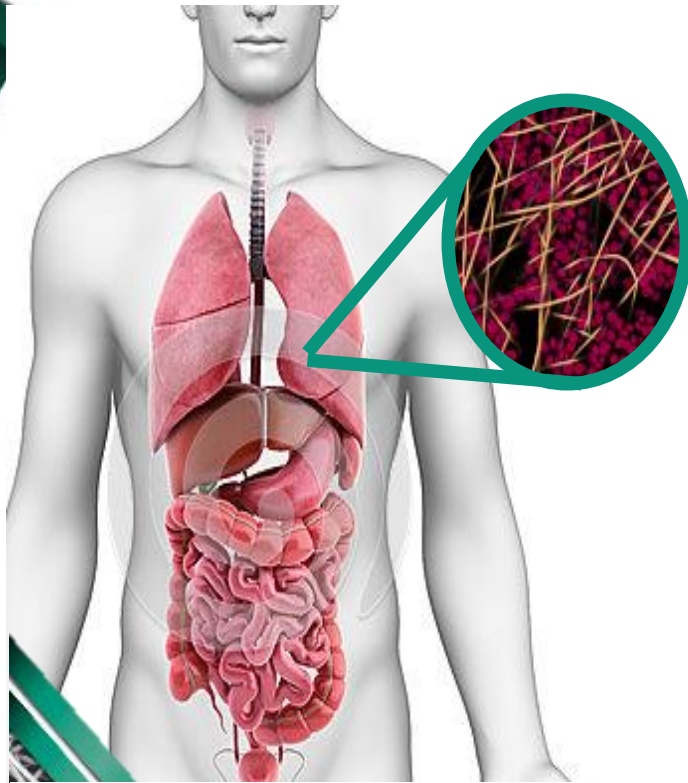
- highly porous architecture
- synthetic polymer (PLLA)



MCF7 breast cancer cells growing in Mimetix scaffold (nuclei stained blue, fibres stained green)



Translation of Research to the Clinic



- Translation into clinic ready prototypes or products
 - Design concept
 - Product development
 - Regulatory support
 - Manufacturing scale-up
 - Clinical grade production
- Range of business models
 - Fee-for-service
 - Collaborative R&D projects

Innovations

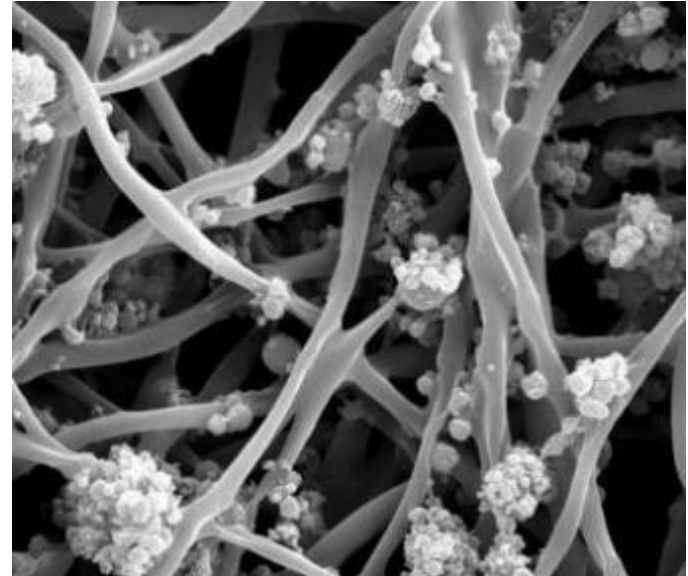
Translation

Medtech
products



Scaffolds Tailored to Range of Applications

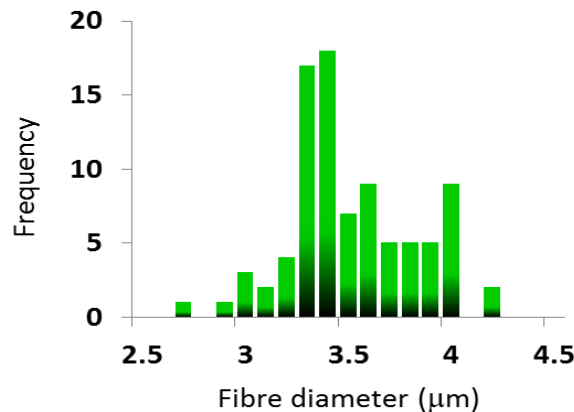
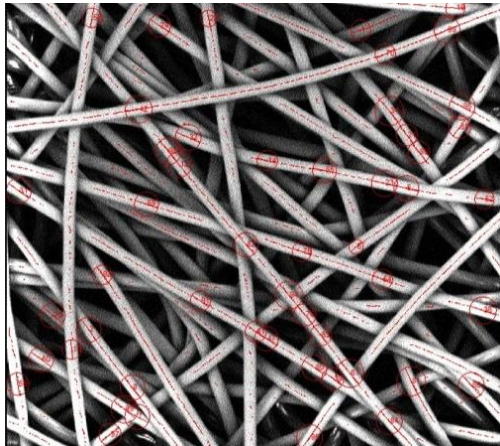
- Material Choice
 - Degradation rate
 - Mechanical properties
 - Chemical functionality
 - Multi-component systems
 - Additives or coatings
- Scaffold Architecture
 - Fibre diameter
 - Pore size and porosity
 - Fibre orientation
 - Scaffold thickness
 - Macroscopic format



Bone regeneration: Human MSCs in a composite electrospun scaffold showing mineral deposition on the surface of osteoblast-like cells (Courtesy of Dr Raghavendran, University of Malaya.)

Quality Testing

- Physical/Biomechanical
 - Fibre diameter
 - Pore size
 - Thickness
 - Tensile strength
- Chemical, e.g. residual solvent
 - Molecular Weight (GPC)
 - TGA, GC-MS, GPC, DSC, etc.
- Functional
 - Cell growth and behaviour



Statistical analysis of fibre diameter distribution using Phenom SEM and Fibermetric software

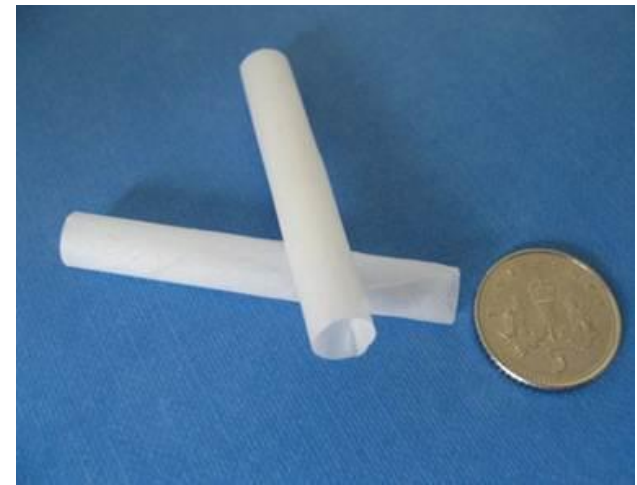
Post Processing Services

- Processing

- Vacuum drying
- Thermal annealing
- Plasma treatments
- Die cutting or laser machining
- Combination/assembly with other materials

- Packing and sterilisation

- Vacuum heat sealing
- Labelling
- E-beam/gamma irradiation
- Sterility testing
- Shelf-life/stability studies



Quality Management

- ISO Class VII clean room
- ISO-13485 Quality Management System
- SOPs for all processes ensure reproducibility and traceability
- QC on all materials
- Regulatory Documentation



Case Studies

- Rapidly degrading scaffolds for corneal transplant for clinical trials (University of Sheffield)
- Membranes for repair of oral defects (University of Freiburg)
- Medical devices for repair of tendons (University of Manchester)
- Devices for minimally invasive tendon reconstruction (US company)
- Biosynthetic hybrid membranes for hernia repair (InnovateUK)
- Bioartificial liver organoids (EU FP7 ReLiver)
- Bioreactor inserts for production of stem cells (EU FP7 HESUB)

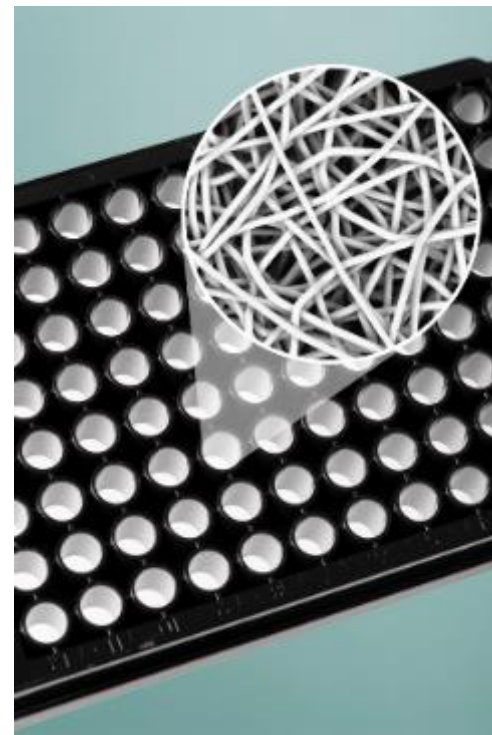




MIMETIX
CELLS IN 3D

Laboratory Consumables

- Laboratory research tools for more predictive drug discovery assays
- “3D cell culture made easy”
 - Compatible with standard lab equipment
 - Reproducible results
- Proprietary technology to ensure uniform, flat base with excellent optical clarity



Development supported by
TSB SMART grant 701224





ELECTROSPINNING COMPANY

- Your partner of choice for translation of electrospun scaffolds to the clinic

