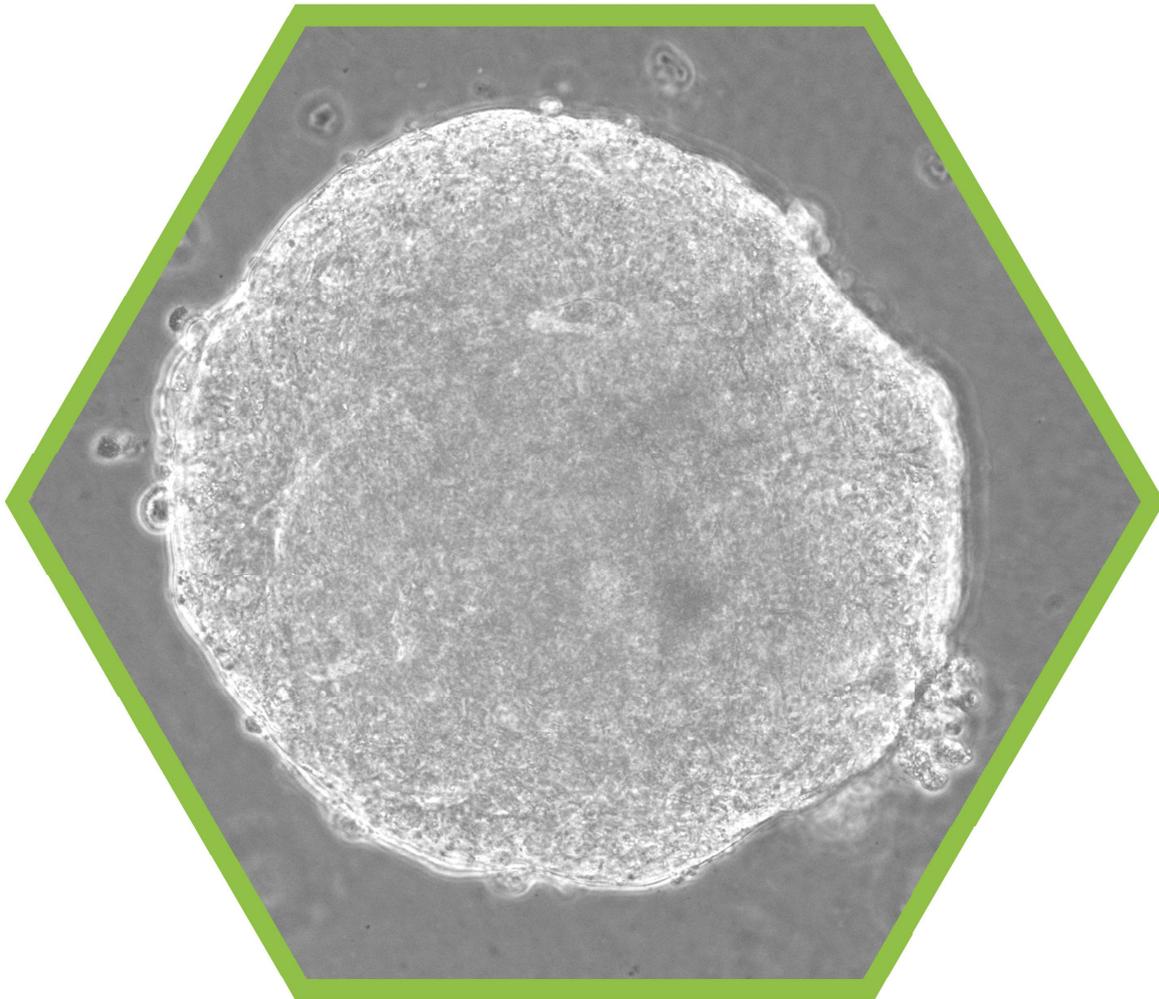




Manchester  
**BIOGEL**

Redefining cell culture for life science

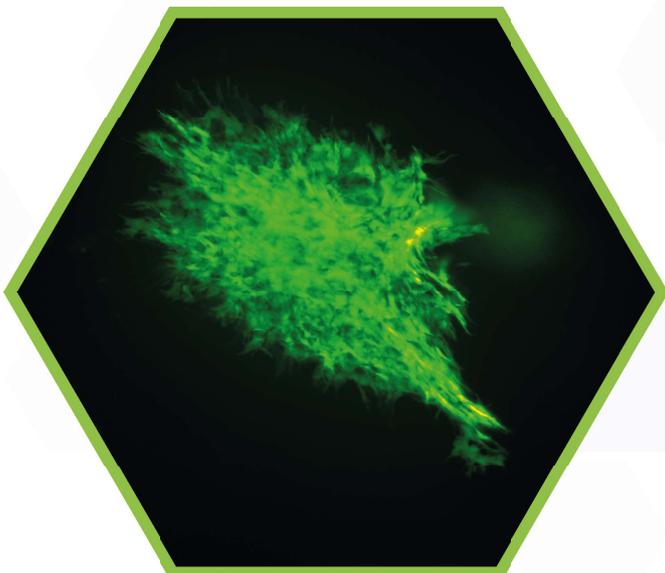
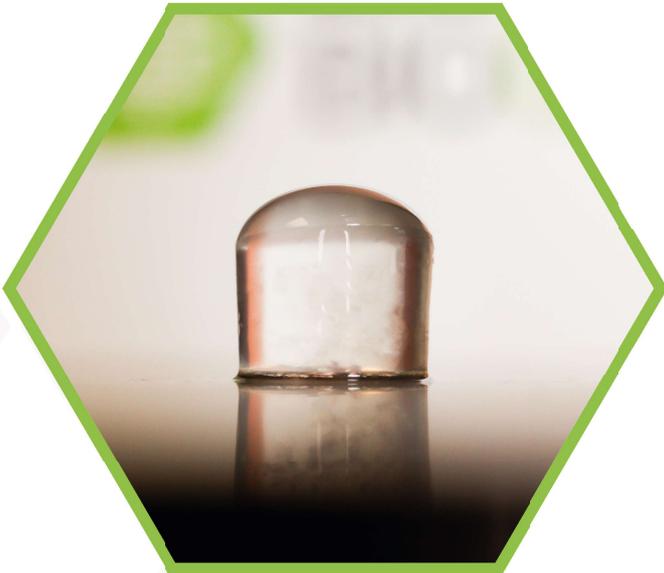
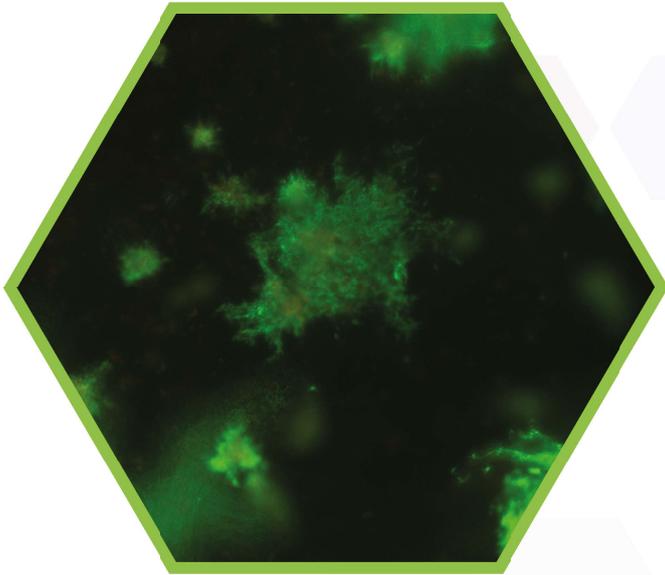


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'PeptiGels® have proven to provide a **favourable environment** for stem cells and be a vehicle for translational research'

Dr Evgeny Kushnerev  
NIHR Academic Clinical  
Lecturer in Oral  
Surgery

'PeptiGels® are very easy to work with. They are simple to use and not time consuming at all, and best of all they give **consistent results**'

Dr Natasha Lewis  
Biomaterials Scientist –  
KTP Fellow, Cell Guidance  
Systems



# Manchester BIOGEL

In 2014 Manchester BIOGEL was founded by University of Manchester Professors Aline Miller and Alberto Saiani. The aim; **to provide high quality, ethical and reproducible hydrogels for cell culture**. Since 2014 the company has rapidly grown and now offers a wide range of **PeptiGels®**, **PeptiInks®**, **Bespoke PeptiGels®**, **lab consumables and R&D services**.

With growing global demand for PeptiGels® the company moved in 2020 to larger facilities within Alderley Park, UK and subsequently opened its own in-house cell culture laboratory.



Professors Aline Miller and Alberto Saiani co-founded the company in 2014.

## The Technology

Our peptide materials are fully synthetic and spontaneously self-assemble to form 3D nano-fibrous hydrogels that mimic the native extracellular matrix (ECM).

The mechanical stiffness of these hydrogels is easily varied and can match the stiffness of any tissue type. The fibre surfaces can be (bio) chemically functionalised with several biomimetic peptide sequences from key ECM proteins that are proven to signal and enhance biological processes. These include **RGD (fibronectin)**, **IKVAV (laminin)**, **YIGSR (laminin)** and **GFOGER (collagen)**.



# Core Benefits



## No Batch to Batch Variation

By producing our PeptiGels® in-house we can reduce all batch to batch variation, ensuring you receive **the same product each time.**



## Ready to Use

Our PeptiGels® come ready to use and are room temperature stable. **No freezing. No defrosting. No difficult handling.**



## Animal Free

Made entirely from synthetic peptides our PeptiGels® are **completely animal free and ethical.**

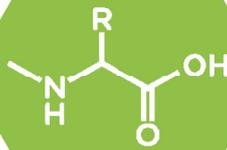


# Core Benefits



## Transparent

PeptiGels® have full optical clarity, allowing for **easy cell imaging**.



## Chemically Defined

By producing our PeptiGels® from chemically defined ingredients, we know exactly what PeptiGels® are made from.

**No unknown by-products.**



## Biocompatible

Our PeptiGels® have **inherent biocompatibility**.



## Printable

The PeptiInk® range is designed to be **used with any 3D printers**.

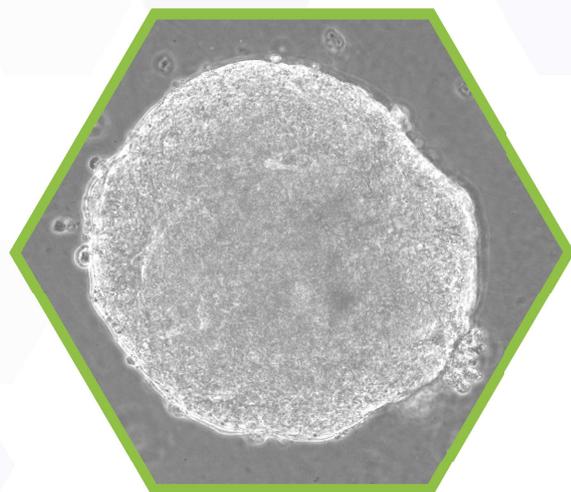


# Applications

## Complex 3D Models i.e. Organoids

Organoid formation in preclinical studies requires the use of an extracellular matrix. However, these ECMs are often derived from tumorigenic source, which limits the translational data and adoption of organoids. Successfully growing organoids in PeptiGel® allows reproducible and scalable results to be achieved, to provide more reliable preclinical studies for the pharmacological and toxicology industries.

Read our case study on the use of PeptiGels® in the Development of Gastro-intestinal Organoids



## Disease Modelling

The extracellular matrix of different organs and cellular settings have very different physicochemical properties. So, when performing work in vitro you want a scaffold that best mimics the in vivo environment of the tissue your studying.

Research from Imperial College London has demonstrated the use of PeptiGels® to mimic the mechanical and chemical environments of both healthy and cancer tissues.

'We were excited to use PeptiGels® as a platform for cell biology studies and tailor the hydrogel properties to mimic the mechanical and chemical environment of **both healthy and cancer tissue**'

Dr Armando Del Rio Hernandez  
Senior Lecturer, Department of Bioengineering at Imperial  
College London



# Applications

## Bioprinting

PeptiInks® have shear thinning properties, hence they can be injected, printed, and recover their structural integrity immediately after the shear is removed. PeptiInks® also have tuneable mechanical properties and they can promote cell attachment, proliferation, and differentiation, making them suitable bioinks for 3D bioprinting applications.

Read here how Dr. Marco Domingo's group (University of Manchester) used PeptiGels® with varying stiffness to print mammary epithelial cell laden constructs with high structural integrity using an extrusion based bioprinter.

'PeptiInks® offer excellent compromise between the physicochemical and biological properties of the printed structure to ensure it retains its structural integrity in addition to a **high cell viability**'

Dr Marco Domingos  
Senior Lecturer in Bioprinting and Regenerative Medicine



## Regenerative Medicine

PeptiGels® can be used as scaffolds for cellular organization and morphogenic guidance, to serve as tissue barriers and bio adhesives, to act as drug depots, to deliver bioactive agents that encourage the natural reparative process, and to encapsulate and deliver cells.

Check out how a research group within the University of Manchester used PeptiGels® to help Prevent Oesophageal Strictures and Promote the Regeneration of Healthy Tissue

'I tried other peptide-based hydrogels, but these either had too much batch to batch variation or were only suitable for 2D cell culture. With PeptiGel® products I was able to grow 3D cell cultures with the desired morphology to aid my research on a variety of cell and tissue types.'

Prof Julie Gough

Professor of Biomaterials and Tissue Engineering at the University of Manchester



# Applications

## Stem Cell Therapies

PeptiGels® are injectable, sprayable and biocompatible. They can therefore be used as scaffold for the delivery of cells for cell therapies application promoting cell survival and retention at delivery site.

Check out the work from Dr Adam Reid group on the use of Peptigels® as stem cell deliver scaffold for Nerve Repair.

Check out this paper on Stem Cell Therapies for Nerve Repair

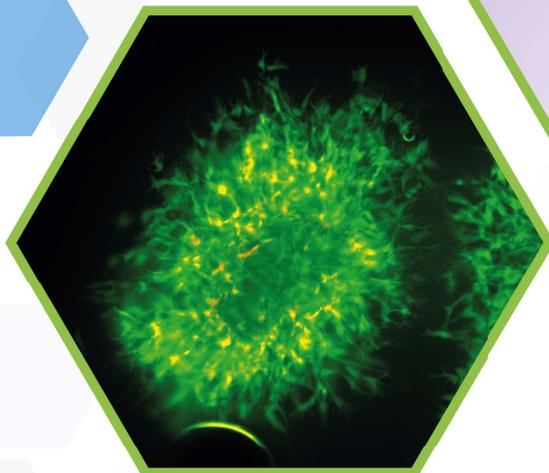


'PeptiGels® can be used as scaffolds for the culture and differentiation of hdASCs in vitro towards a Schwann cell-like phenotype. We are continuing to explore the potential of PeptiGels® to generate fully-synthetic bioengineered nerve grafts for the treatment of peripheral nerve injuries'

Dr Adam Reid  
Senior Clinical Lecturer in Plastic and Reconstructive  
Surgery at the University of Manchester

## Drug Delivery

PeptiGels® are shear thinning materials, and consequently can be injected or sprayed to specific sites in vivo making them ideal delivery vehicles for the controlled and sustained release of therapeutics.



## PeptiGel® Alpha 4

Alpha 4 is our most versatile gel and is currently used worldwide with a variety of tissue types including; **adipose, breast, heart, pancreas and synovial membranes.**

## PeptiGel® Alpha 4 Plus

Alpha 4 Plus is based on Alpha 4, but with **fibronectin (RGD) and collagen (GFOGER)** integrated into the peptide structure, offering improved extracellular matrix - cell interactions. Alongside the applications of Alpha 4, our Plus variety has been optimised for use with **oesophagus, dermal and kidney tissues.**

## PeptiGel® Gamma 4 Plus

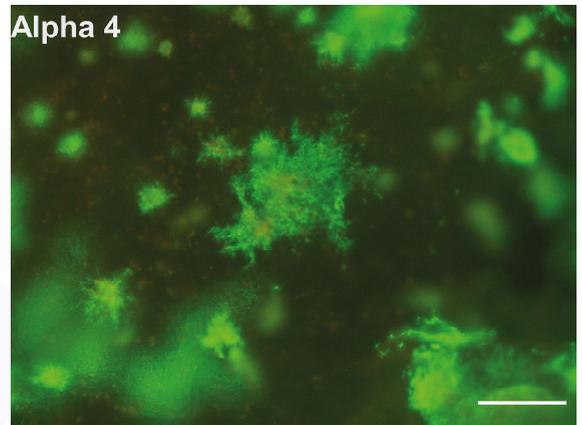
Gamma 4 Plus is based on the same formulation as Alpha 4 Plus, but has been tweaked to allow for a **softer gel** to handle, allowing for the **creation of dome structures** perfect for replicating the **Hanging Drop method.**

## PeptiGel® Alpha 2

Before the addition of cell media, Alpha 2 is a liquid like substance, designed for the **easy mixing of cells.** Once exposed to cell media Alpha 2 stiffens to be our **stiffest catalogue gel.** We recommend Alpha 2 for **neuronal and other associated tissues.**

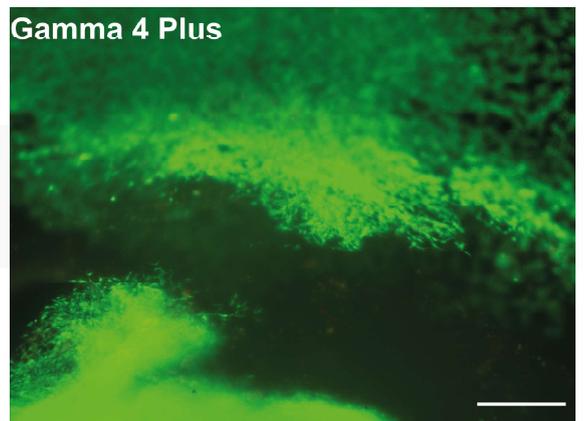
## PeptiGel® Alpha 1

When mixed with cell media, Alpha 1 provides a stiffer cell environment than Alpha 4, yet slightly weaker than Alpha 2. Alpha 1 is widely used for the culture of **monocytes, chondrocytes and nucleus pulposus cells.**



Images: Fibroblast NIH/3T3 cells encapsulated within Alpha 4 and Gamma 4 plus.

The images were taken at day 14 with a fluorescent microscope and the scale bar is 500um



# Other Services



## Bespoke PeptiGels®

Do you want to try a gel more tailored to your cells?

We offer a bespoke service where we can integrate RGD, IKVAV, YIGSR or GFOGER groups into the gels. Got another group you want integrated into the matrix? Drop us an email!



## Starter Kit

Do you want to try our PeptiGels®. Get two 5ml vials of our catalogue PeptiGels® as well as a positive displacement pipette and a box of sterile tips!



## Mechanical Kit

In our MechanoKit, you will receive 3 x 5ml PeptiGel® vials at varying stiffnesses to find the most suitable environment for your cells' needs.



## Functional Kit

Explore a range PeptiGels® functionalised with RGD, GFOGER, IKVAV, & YIGSR that provide biochemical cues to investigate the response of your cells in the 3D environment



## Consumables

We also sell positive displacement pipettes and the most popular cell culture consumables from leading brands.



# 3 Simple Steps to get Started

**Step 1**  
Mix cell suspension  
with PeptiGel®



**Step 3**  
Add media to well  
and incubate



**Step 2**  
Pipette PeptiGel®  
-cell mixture  
into well or insert



PeptiGels® are **ready to use**, from the moment they arrive. **No difficult chemistry and no freezing or defrosting.**

## Protocols

We have a large selection of tried and tested protocols to help you get started, including 2D and 3D cell culture and various extraction protocols, alongside general handling, ensuring that you are confident with PeptiGels® from day one!

## Pipetting PeptiGels®

When pipetting PeptiGels®, we recommend using a positive displacement pipette. Scan the QR code for a demonstration of how easy our PeptiGels® are to handle.



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