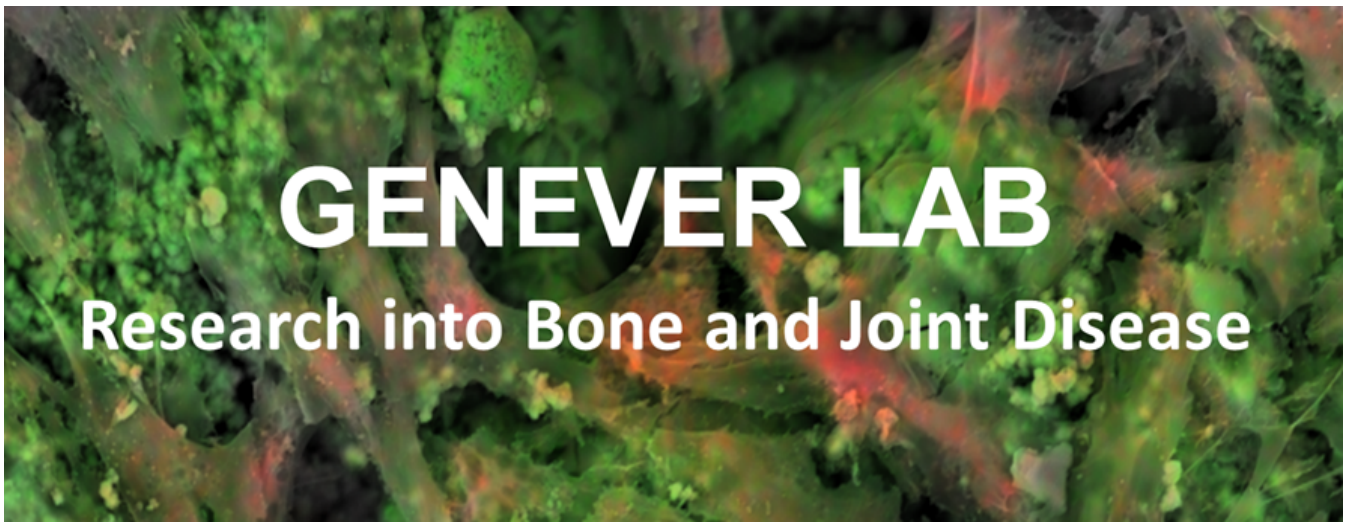
Newsletter



Dear Readers,

@genever_lab

We would like to wish you all a Happy New Year!

We hope 2021 finds you in good health and brings you lots of happiness and joy! With the vaccine released, going back to normality is on the horizon and we are all looking forward to meeting friends and family! Despite coronavirus, we managed to have our lab Christmas party by organising a fun online quiz game with nibbles. Here is what else we have been up to in the past few months.

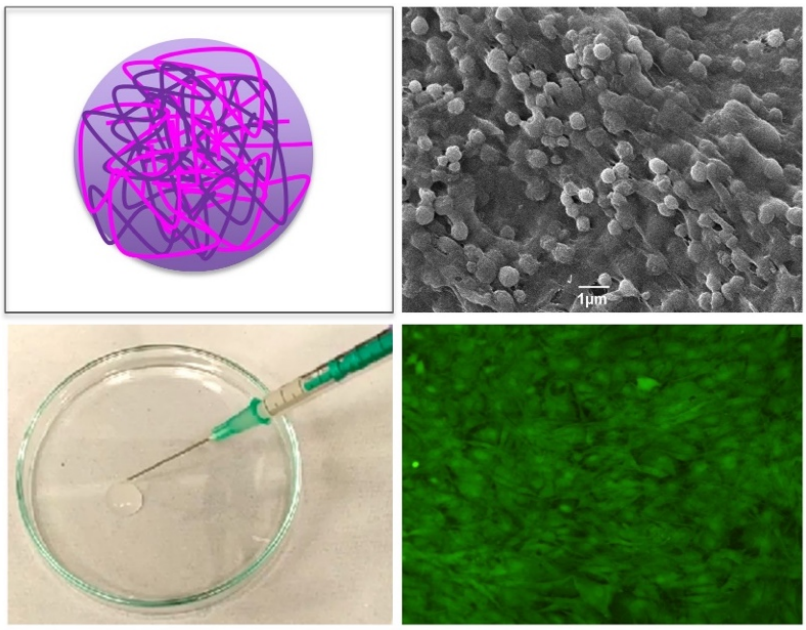
Genever lab highlights

- Andy has finished his PhD and has moved to Boston where he has started as a postdoc at Harvard University. Best of luck with your new beginning Andy!
- Savvas presented his PhD research in a form of a poster at the annual WhiteRose DTP symposium organized by the Universities of York, Sheffield and Leeds.
- Abbie and Vrinda joined the lab in October and they have started their final year projects with us.
- David was recently awarded a three months extension on his current project for licensing plan development via the iCURe programme. He has been attending international conferences and his work aims for the translation of our work into clinical applications, more to follow.
- Carmen published her latest paper with Alasdair about small gel particles for the controlled release of the anticoagulant heparin. A brief summary is on the next page, while the whole paper can be found here: https://rsc.li/3p4HHcu
- Following the latest lockdown rules, our lab operates at 25% capacity. Working with the York city council and the NHS, the University has made available free asymptomatic rapid tests. These are running with the help of volunteers and are available for all staff and students.
- University staff and students have volunteered to help distribute the vaccine.

Injectable Self-Assembled Microgels Enhance Stem Cell Growth

A new technology developed in the Department of Chemistry can fabricate injectable biocompatible microgels, with sub-micrometre diameters, that can release bioactive agents and hence enhance stem cell growth.

Self-assembled gels have great potential for wide-ranging applications including drug delivery and tissue engineering. These versatile materials spontaneously and reversibly assemble from small-molecule building blocks. However, the gels are often very weak, and this can make it difficult to fabricate them with controlled shapes and sizes. In particular, it is very challenging to make microgels with sub-micrometre particle sizes. Such microgels would have applications in biomedicine because their small size potentially allows them to be injected. In a major breakthrough, Dr Carmen, working in the research team of Professor David Smith developed a new way of stabilising sub-micrometre self-assembled gel particles. She developed a way of making gel beads that were just 800 nanometres (0.8 micrometres) in diameter, and then stabilised them in a simple process using alginic acid, a naturally-occurring polymer found in seaweed, as a reinforcing agent. Dr Piras demonstrated that these microbeads were stable to the injection process, were stable in cell culture medium and could be loaded with heparin, a bioactive agent. In collaboration with Dr Alasdair Kay and Professor Paul in the Department of Biology, she then went on to demonstrate that her microgel beads could release heparin, encouraging enhanced stem cell growth.



Schematic of a microgel (top left), electron microscopy image showing particles smaller than 1 micrometre (top right), injection of the microgel through a syringe (bottom left), stem cell growth encouraged by heparin-releasing microgels (bottom right).

As Carmen explains: “Injectable systems that can release heparin and assist stem cell growth are of great potential interest in tissue regeneration. Stem cells are being explored to encourage recovery after tissue damage or major surgery. A simple, injectable, biocompatible microgel that can encourage greater stem cell proliferation in the damaged area would be of great potential value.” Reflecting more broadly on the research, Professor Smith said: “This approach to self-assembled microgels should be applicable to very many other self-assembling gels, each of which can have different types of activity and potential uses. This innovative fabrication method should therefore open up a wide range of applications that were simply not previously possible.”

David's work on clinical applications of our research

David has attended multiple global conferences including bio Europe, Advanced Therapies, and the Cell and gene therapy development summit. This allowed him to network with companies from across the world including Japan, the USA, Germany, the UK, Spain, the Netherlands, and South Korea. He has been invited onto a round table discussion to talk about automation regarding raw material handling in cell and gene therapy manufacturing. His work deals with finding scalable clinical applications of the extracellular vesicles produced by our stem cells.

Staying in touch

It has been almost a year since the pandemic entered our lives uninvited. But the end is near! At the Genever lab we remain hopeful and have some exciting patient involvement events planned for when the restrictions are lifted! Stay strong and do get in touch with us if you need anything, we are always happy to chat and give a helping hand!

Perhaps the biggest highlight in the battle against COVID-19 has been the announcement of a working vaccine. We would love to hear from you

With best wishes,
The Genever Lab

Visit our website to stay in touch: **www.geneverlab.info**