Ultralight 3D electrospun nanofiber sponge for tissue engineering

Gaigai Duan1, Valérie Jérôme2, Ruth Freitag2, Seema Agarwal1, Andreas Greiner1*
1Macromolecular Chemistry II and 2Process Biotechnology, University of Bayreuth, Universitätstrasse 30, 95447, Bayreuth, Germany.

greiner@uni-bayreuth.de, http://www.mcii.uni-bayreuth.de/en/

Aim and Motivation

Electrospinning is the state-of-the-art method for the preparation of nonwovens with fiber diameter < 1 µm.1 Electrospun nonwovens were also applied as artificial scaffolds for tissue engineering. However, it is still a major challenge to have artificial monolithic scaffolds for tissue engineering with high porosity in combination with excellent compressibility, but structural integrity based on electrospun fibers. The goal of this work was to provide highly porous three dimensional (3D) scaffolds mimicking sponges. Further requirement in this work was to provide an universal protocol for the preparation of a large variety of such sponges.

Process of polymerization and preparation of sponges[2]

Comparison of compressive strength with reported materials

Conclusions

- excellent scaffolds for cells
- highly porous
- reversibly compressible

References

See also: https://www.youtube.com/watch?v=qDYEH0K3hM