



Department of
Mechanical Engineering
The University of Hong Kong



SEMINAR

PIC hydrogels as versatile synthetic and highly biomimetic matrix materials

Date: 13 April, 2023 (Thursday)
Time: 2:00 p.m.
Venue: Room 7-34 & 7-35, Haking Wong Building, HKU

Speaker: Professor Paul H. J. Kouwer
Institute for Molecules and Materials
Radboud University
Netherlands

Join Zoom Meeting

<https://hku.zoom.us/j/91076509248?pwd=Y21rN3RxVlhhaaDZRTVdvT0N2VVBKdz09>

Meeting ID: 910 7650 9248

Password: 470912

Abstract:

Fibrous hydrogels are omnipresent in the human body. At very low protein concentrations, they form stable, porous networks that are the basis for mechanical characteristics of cytoskeleton and of the extracellular matrix. The biogels in our bodies are not static; they respond to physical, chemical and cellular cues that adapt their properties.

Such architecture and behavior are not readily realized in synthetic materials. Recently, however, we developed a hydrogel (PIC) that closely mimics the fibrous architecture as well as the linear and nonlinear mechanical properties of cytoskeletal and extracellular matrix materials. The synthetic nature of the material allows us to vary endlessly in physical and biochemical properties.

Our lab studies fundamentals and applications of the biomimetic PIC gel, ranging from immunotherapy to wound care and dental therapies to 3D cell cultures. In any application, the PIC gel is precisely tailored to drive the desired cell response. Mixed expertise in the research group ensures that innovations in hydrogel engineering, for

instance features for in situ and reversible stiffness changes, can be directly applied in a biological context.

In this talk, I will introduce PIC gels, their structure and approaches how to controllably change the physical and biological properties. In addition, I will give various examples on how PIC properties may be used to affect cellular responses.



Biography:

Dr. Paul Kouwer received a PhD from Delft University of Technology (NL). After research fellowships at the University of Hull (UK) and MIT (US), he came back to the Netherlands to Radboud University where he currently is PI. His lab is active at the interface between materials science and cell biology. With its foundations in physical and materials chemistry, the group has built up an extended expertise in the development of highly adaptive soft matter. They developed a hydrogel (PIC gel) for a range of in vitro and in vivo applications, exploiting the group's strength to translate innovations in materials design to biology. Dr Kouwer authored over 100 peer-reviewed publications, of which many in high impact journals, such as Nature, Nature Materials, Nature Communications, Advanced Materials, PNAS, etc. In addition, Dr Kouwer is currently active to commercialize the hydrogel towards 3D tissue culture applications (replacing Matrigel).

ALL INTERESTED ARE WELCOME

For further information, please contact Dr. Y. Lin at 3917 7955.