

International Webinar on Gels and Networks



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Responsive hydrogel thin films: design and functionalities

ABSTRACT: Surface-attached hydrogel films are actual novel alternative to brushes and layer-by-layer assemblies as polymer thin layers. We have recently developed a simple and versatile approach to synthesize reliable and reproducible films with thickness widely ranging from a few nanometers to several micrometers. Surface-attached hydrogel films show very interesting responsive properties: they reversibly modify their thickness with temperature by absorbing/expulsing water with high amplitude change (the change is four-fold or more); the transition is sharp and rapid (within a few degrees around the transition temperature and below one second); hydrogels with adjustable internal architectures can be built such as multilayer hydrogel films, nanocomposite hydrogel films, micro-patterns of hydrogels. I will show that the tailoring of surface-attached hydrogels with well-controlled chemistry allows to face new challenges in various areas. This approach of polymer thin layers makes possible a fine characterization of mechanical properties (friction and adhesion) of hydrogel films in water. Temperature-responsive hydrogels are also used as actuators in microfluidic devices. Moreover, they are suitable for the development of modulable Bragg mirrors with high spectroscopic shift.

Chollet, B. et al. ACS Appl. Mat. Interfaces 2016, 8, 11729-11738.
D'Eramo, L. et al. Nature Micro Nano 2018, 4, 17069.
Delavoipière, J. et al. Langmuir 2018, 34, 9617-9626.
Dompé, M. et al. Adv. Mater. 2019, 31, 1808179.

ABOUT THE WEBINAR:

Due to the ongoing global crisis involving COVID-19, there is little chance for the soft matter community to meet to learn about gels and networks. We propose this seminar as a way for members of the European and Asian communities to share our research and learn from each other, even when social distancing is necessary. The tone of this webinar is informal, and questions can be freely asked at any time. We welcome open discussion, and hope that all who attend will learn a lot!

Webinar website: <http://www.fp.a.u-tokyo.ac.jp/lab/sozai/seminar.html>

Registration: <https://zoom.us/meeting/register/tJModuGvqzIuGNFgYmpQPXqLkp0M3qB0JLDY>

Date: Friday, February 5th, 2021

Time: 17:00-18:30 JST, 9:00-10:30 CET

Cost: Free

Organizers:

Daniel King (Hokkaido University)

Koichi Mayumi (University of Tokyo)

Tetsuo Yamaguchi (University of Tokyo)

Tetsuharu Narita (ESPCI Paris)