

SoftMatterWorld Newsletter

the web's foremost resource on soft condensed matter

December 2010, Issue 24

Dear Soft Matter Colleagues,

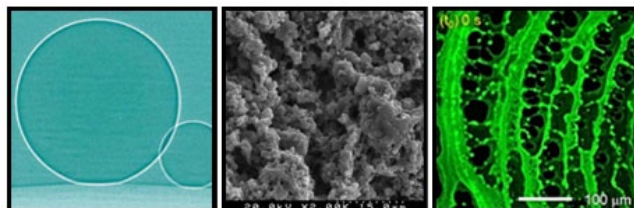
Happy Holidays! As the new year approaches so does the 2 year anniversary of the Soft Matter World Newsletter! 15 new conferences and workshops for 2011 have been posted in the Latest News section along with plenty of new positions in the Noticeboard. We are also happy to announce, after months of reconstruction, the launch of the new [Global Network Map](#). ***If your group is part of the global network please check to make sure your group has been added with all of the correct information.***

X-Ray Imaging Center: Pohang University

This month we are honored to feature the [X-Ray Imaging Center \(XIC\)](#) based at the Pohang University of Science & Technology (POSTECH) in Pohang, South Korea. The X-Ray Imaging Center, supported by the Creative Research Initiatives (CRI) Program of the Korean

Ministry of Education, was established in 2006 to conduct frontier research on the core technology of 'functional X-ray imaging'. Functional X-ray imaging is aimed at imaging and characterizing the nanometric and dynamic behavior of the internal structure of matter. The center is currently led by Prof. Jung Ho Je and Prof. Byung Mook Weon.

The research approaches soft matter imaging in a unique fashion by using real-time in-situ X-ray imaging coupled with X-ray-responsive soft materials. The novel interaction of X-ray photons and soft materials opens potential opportunities for the control and study of multi-phase systems while being able to observe them in real time. With this approach X-rays are used to trigger dynamic behavior changes in soft systems. For example, hard X-rays are used to trigger a decrease in the surface tension of pure water droplets at the air/water interface.¹ This method is further used to induce changes in the wettability of a variety of in-



(left)-Two coalescing air microbubbles at the water-oil interface taken in real time using synchrotron X-ray microradiograph. (center)-A SEM image of an artificial bone substitute of bioactive hydrogels. (right)-Fluorescently labeled polymethylmethacrylate particles after evaporation.

organic substances.² This research can be used in many devices such as biosensors, microfluidic tools, and intelligent membranes.³

Other research interests include x-ray biomedical imaging, allowing for much higher contrast than conventional methods while reducing the need for contrasting agents, and nanomaterial fabrication.

The [website](#) contains PDF's of publications, great research images and details on their research facilities.

<<http://xic.postech.ac.kr/index.html>>

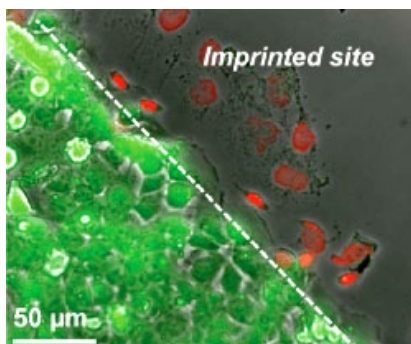
1. B.M. Weon, J.H. Je, Y. Hwu, G. Margaritondo. *Phys. Rev. Lett.* 100, 217403 (2008).
2. Y. Kwon, B.M Weon, K. Won, J.H. Je, Y. Hwu, G. Margaritondo, *Langmuir* 25, 1927 (2009).
3. Kwak, D.; Han, J. T.; Lee, J. H.; Lim, H. S.; Lee, D. H.; Cho, K. *Surf. Sci.* 2008, 602, 3100-3105.

Stamp Wound Assay for Studying Coupled Cell Migration and Cell Debris Clearance

J.Lee, Y.L.Wang, F.Ren, T. P. Lele. *Langmuir* 2010, 26(22), 16672–16676.

In this article a novel method for studying wound healing under realistic conditions is described. The method involves creating defined patterns of damaged cell debris with poly(dimethyl)siloxane (PDMS) molds. The molds are stamped onto epithelial cell monolayers. This assay permits the quantification of wound healing rates in the presence of cell debris.

The experimental results suggest that cell migration in the



Overlaid image of phase contrast and fluorescent microscopic images (red fluorescence indicates dead cells; green fluorescence indicates live cells).

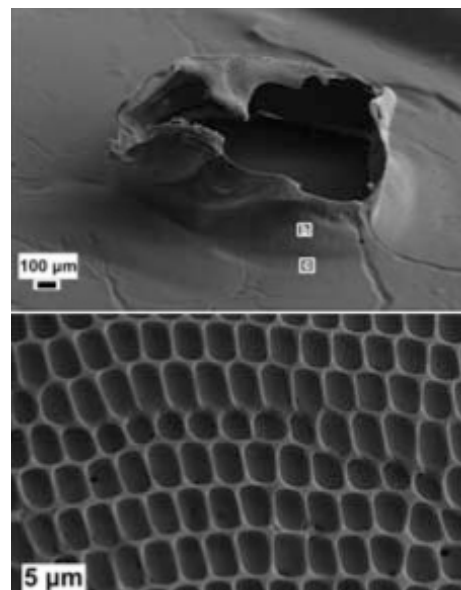
presence of cell debris is a two-step process requiring cell debris clearance and cell migration into newly cleared wound areas. The unique method allows the study of coupled cell migration and debris clearance while remaining in-vitro. Read more at [ACS publications](#).

Constructing robust 3-dimensional conformal micropatterns: vulcanization of honeycomb structured polymeric films

L.Li, Y.Zhong, J.Gong, J.Li, C.Chen, B.Zeng, Z.Ma. *Soft Matter*. 2010. DOI: 10.1039/c0sm00809e

Researchers present a new process for constructing 3-dimensional conformal microporous films on nonplanar substrates, with a commercially available triblock polymer, polystyrene-*b*-polyisoprene-*b*-polystyrene. The polymer can cover the surface of nonplanar substrates (a sugar crystal) with ordered porous morphology despite the sharp corners and irregular shapes on the surface of the crystal. In subsequent steps the polymer films were vulcanized and effectively crosslinked, stabilizing the micropatterns while improving their thermal stability and solvent resistance.

Furthermore, To highlight the capability of this patterning technology, the authors use two other solid substrates with different bas-relief patterns to fabricate polymer films with hierarchical structures. This research may prove to have many promising applications in biosensors, liquid chromatography and micro-reactors. Read more at [RSC publications](#).



(top) A scanning electron micrograph of 3D micro-patterned SIS film after vulcanization and water dissolution of sugar crystal, following with heat treatment up to 350 C in air. (bottom) Scanning electron micrographs of micro-patterned structures.

ICAM presents: Metamaterials 2011

The 2011 [Metamaterial Workshop](#) is taking place April 9-12, 2011 in Hangzhou, China in conjunction with the annual meeting of the [International Institute for Complex Adaptive Matter \(ICAM-2011\)](#). This workshop will bring together prominent scientists, postdoctoral fellows and students, and will enable the scientists in the areas of electromagnetics, photonics, soft materials, energy materials and nanotechnology to discuss recent advances in the field of metamaterials. Topics that will be discussed include the fundamental physical effects and technologies of metamaterials in interdisciplinary research and the applications of metamaterials in many subjects, such as: microwave electromagnetics, integration and information optics, biophotonics, nonlinear optics and quantum optics.



There will be approximately 100 participants to attend about 20 oral presentations. Participants can expect very diverse speakers/participants from Asia, US, Europe, and encourage their interaction and collaboration. The general application deadline is January 25, 2011.

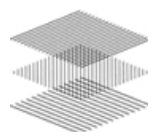
To read more visit the [website](#);
<<http://icamconferences.org/metamaterial/>>

Soft Matter Physics Approaches to Biology



The Kavli Institute of Theoretical Physics at the University of Santa Barbara, California is organizing a conference on [Soft Matter approaches to Biology](#) on May 23-27, 2011. The conference is aimed at elucidating progress and challenges at the biological frontier of soft matter and polymer physics. Specifically, the conference will discuss important aspects of soft matter physics and their application to biological systems. To read more visit the [website](#);

<<http://www.kitp.ucsb.edu/activities/dbdetails?acro=biopoly-c11>>



BLCS Winter Workshop

The [British Liquid Crystal Society](#) is holding its Winter Workshop at the University of Hull from January 10-12, 2011.

A general introduction to liquid crystals will be provided as the first topic after which a wide range of 'Liquid Crystal' topics are included and substantial time has been allocated to the practical sessions. Some of the time will be devoted to teaching various techniques involved in the design, synthesis and characterisation of liquid crystals. To read more visit the [website](#);

<<http://www.hull.ac.uk/chemistry/research/BLCS/wwindex.htm>>

We hope you enjoy browsing softmatterworld.org and come back soon



Linda S. Hirst and Adam Ossowski
SoftMatterWorld.org

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