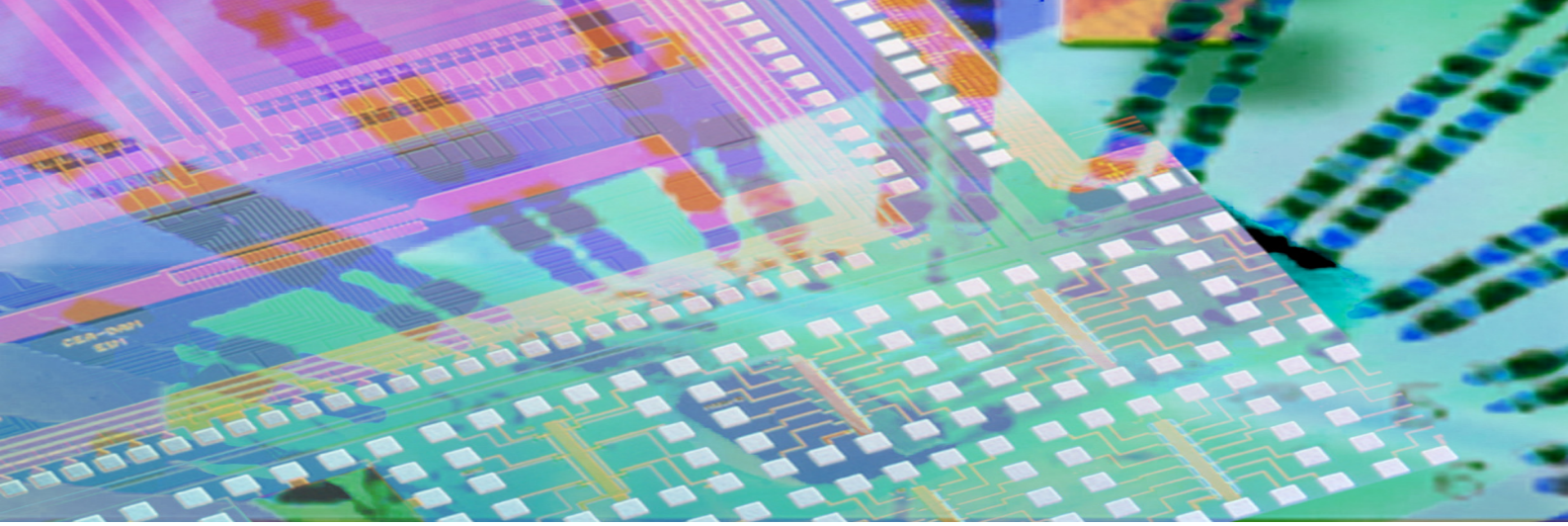

# Nano2Life
# External Newsletter

Dear reader,

welcome to the first issue of Nano2Life's external newsletter in 2008. Did you know that our public website has more than 10.000 visits per month? Have scientists found the cause for hypertension? Are Chinese interested in Nano2Life? Find out more….

Happy Reading!

The editors

Comments and contributions to n2l@bioanalytik-muenster.de

## *news and activities*

### European Landmark in Nanobiotechnology

**Nano2Life will present its major achievements on 26th February 2008, in Brussels for stakeholders, EC representatives and the scientific community.**

**After four years of operation, Nano2Life has become the visible face of European nanobiotechnology and is the most active European network in this field. Founded in 2004 it comprises 23 major European R&D organisations from 12 countries and more than 30 associated partners from industry and academia.**

**[more] [back]**

### Annual Meeting 2008

**The annual meeting 2008 took place from 9th to 11th January 2008 in Champéry, Switzerland. About 150 people from the N2L community attended the meeting. It offered an excellent opportunity to learn about the various initiatives launched by the Nano2Life consortium, listen to challenging topics, present the work in posters, interact with colleagues, initiate projects and learn about the latest news in nanobiotechnology.**

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### N2L Awards at Annual Meeting

**During this year Annual Meeting in Champéry several prices were awarded to young scientists from Nano2Life.**

***Best Young Scientist of Nano2Life***

**This price is awarded to the most active young scientist, participating in N2L, using the mobility programme, visiting the summer and research schools, attending the e-mentor programme and PROGRESS Course, attending the annual and scientific meeting. Important are also good interactions with junior and senior scientists.**

**Ana Ruiz, JRC**

***Best Young Scientist Publication 2007***

**Kevin Heyries, Christophe A. Marquette, Loic Blum: "Straightforward Protein Immobilization on Sylgard 184 PDMS Microarray Surfaces"; Langmuir 2007, 23, 4523-4527.**

**In this work, a straightforward technique for protein immobilization on Sylgard 184 is described. The method consists of a direct transfer of dried protein/salt solutions to the PDMS interface during the polymer curing. Such non-conventional treatment of proteins was found to have no major negative consequence on their integrity.**

***Best Young Scientist Poster***

**1st Prize Sefi Vernick, TAU, Israel**
**"Direct Metallization of Single Enzyme Molecule with Preserved Enzymatic Activity"**

**2nd Prize Magnus Jonsson, Lund, Sweden**
**"Nanoplasmonic biosensor with signature for lipid bilayer formation"**

**3rd Prize Georgette Salieb-Beugelaar, MESA+, Netherlands**
**"Field Dependant DNA Mobility in 20nm High Nanoslits"**

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## *events*

### TOPIM'08: Imaging of Nano-Objects Les Houches, France, 4th – 7th February 2008

**TOPIM is a yearly 5-day workshop for 70 attendees from Academia and Industry (only 5 places left). Every year, a red-hot aspect of research in Molecular Imaging is discussed in an exceptional environment likely to stimulate interdisciplinary exchanges.**

**Starting this year, TOPIM will begin with a 2-day course for students and newcomers to the field: Imaging of nano-objects.**

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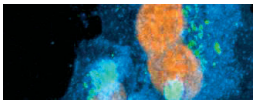
### 7th Conference and Workshop on Biological Barriers and Nanomedicine Saarbruecken, Germany, 20th - 28th February 2008



The programme offers the extraordinary opportunity to combine scientific theory with laboratory practice. Visit the Seminar on Skin Barrier, the Seminar on Mucosal Barriers and Nanomedicine, the Lab Course on Non Invasive Methods to Measure, and the Lab Courses on Nanomedicine.

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### Label Free Biosensing - Transducers, Nanotechnologies and Applications, Enschede, The Netherlands, 8th - 9th April 2008

This workshop is dedicated to direct, or label-free, sensing of biomolecular interactions where different methods and aspects of label-free sensing will be discussed by a wide range of experts. All label-free biosensing systems are comprised of three essential components integrated in one system: i. Sensor, ii. Sensor surface (-chemistry) and iii. Sample fluidics.

Contact: Edwin T. Carlen, BIOS Group, University of Twente

[more…] [back]

### ESDA - Conference on Engineering Systems Design and Analysis, Haifa, Israel, 7th-9th July 2008

TAU is hosting the ESDA conference in Haifa, the 9th Biennial ASME conference on Engineering Systems Design and Analysis (ESDA). TAU wants to offer all N2L members the opportunity to submit abstracts to this conference, especially to the special session on CNT and nano fibres (fabrication, applications, characterization, and more), organized by Yael Haenin, a N2L TAU member. Abstracts should be submitted to the Micro and Nano Technology track of the conference.

[more…] [back]

## *news from the partners*

### CEA – Launch of FTP Nanomed

The French Technology Platform on Nanomedicine – FTP Nanomed – was officially launched on 19th December 2007, in Paris. This group encompasses all French stakeholders dealing with various aspects of nanomedicine, like companies, academia, research institutes, funding and programme agencies, ministries and associations. The FTP Nanomed acts as a national mirror platform to the European Technology Platform on Nanomedicine and as a think tank where all French stakeholders can meet and initiate joint initiatives.

Registration and contact: sivan@ecrin.asso.fr

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### Demokritos – Guests from Shanghai in Athens, and more…

On November 5th a 7 - member delegation of the Shanghai Association for Science & Technology (SAST), headed by the Vice president Mr Yang Guangsheng, visited NCSR Demokritos to discuss collaboration for future events. SAST is the biggest nature science association in Shanghai. N2L activities were presented in the meeting and brochures were distributed.

N.C.S.R. "DEMOKRITOS" organized the 3rd International Conference "Micro & Nano2007" on Micro-Nanoelectronics, Nanotechnology and MEMs. Many N2L participating researchers participated and presented their research. Brochures of N2L were distributed at the conference.

The next two-weeks intensive Nano2Life Summer School "Methods in Micro-Nano-technology and Nano-biotechnology" will take place in Demokritos, Athens, Greece, June 30- July 10, 2008. The course offers classroom and laboratory experience on fabrication, patterning, microfluidics, microarrays, sensors, lab-on-a-chip devices, principles of cell biology biomolecules, bioinformatics and proteomics, metabolomics, drug delivery, bioengineered nanomaterials, imaging with scanning probes, MR imaging, etc. (See details in the site of the 2007 summer school!). Members from N2L are eligible for fellowships for registration in the course.

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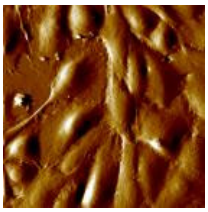
## *publications*

### Plasma sodium stiffens vascular endothelium and reduces nitric oxide release



**Ingestion of large amounts of salt in the diet has been associated with increased blood pressure and harm-ful cardiovascular effects, but precisely how salt influences blood pressure is not clear. Oberleithner et al. describe experiments showing a direct effect of sodium on the physical stiffness of endothelial cells. The results indicate to a possible cause of the deleterious effects of hypertension.**

**Dietary salt plays a major role in the regulation of blood pressure, and the mineralocorticoid hormone aldosterone controls salt homeostasis and extracellular volume. Recent observations suggest that a small increase in plasma sodium concentration may contribute to the pressor response of dietary salt. Because endothelial cells are (i) sensitive to aldosterone, (ii) in physical contact with plasma sodium, and (iii) crucial regulators of vascular tone, we tested whether acute changes in plasma sodium concentration, within the physiological range, can alter the physical properties of endothelial cells. The tip of an atomic force microscope was used as a nanosensor to measure stiffness of living endothelial cells incubated for 3 days in a culture medium containing aldosterone at a physiological concentration (0.45 nM). Endothelial cell stiffness was unaffected by acute changes in sodium concentration <135 mM but rose steeply between 135 and 145 mM. The increase in stiffness occurred within minutes. Lack of aldosterone in the culture medium or treatment with the epithelial sodium channel inhibitor amiloride prevented this response. Nitric oxide formation was found down-regulated in cells cultured in aldosterone-containing high sodium medium. The results suggest that changes in plasma sodium concentration per se may affect endothelial function and thus control vascular tone.**

Hans Oberleithner, Christoph Riethmueller, Hermann Schillers, Graham A. MacGregor, Hugh E. de Wardener, and Martin Hausberg, PNAS _ October 9, 2007 _ vol. 104 _ no. 41 _ 16281–16286

[more…] [back]

### Analysis of storage lipid accumulation in Alcanivorax borkumensis: Evidence for alternative triacylglycerol biosynthesis routes in bacteria

**Marine hydrocarbonoclastic bacteria like Alcanivorax borkumensis play a globally important role in bioremediation of petroleum oil contaminations in marine ecosystems. Accumulation of storage lipids, serving as endogenous carbon and energy sources during starvation periods, might be a potential adaptation mechanism to cope with nutrient limitation which is a frequent stress factor challenging those bacteria in their natural marine habitats. Here we report on the analysis of storage lipid biosynthesis in A. borkumensis strain SK2. Triacylglycerols (TAGs) and wax esters (WEs), but not poly(hydroxyalkanoic acids), are the principal storage lipids present in this and other hydrocarbonoclastic bacteria. Although so far 1assumed to be a characteristic restricted to Gram-positive actinomycetes, substantial accumulation of TAGs amounting up to a corresponding fatty acid content of more than 23% of the cellular dry weight is the first description of large-scale de novo TAG biosynthesis in a Gram-negative bacterium. The acyltransferase AtfA1 (ABO_2742) exhibiting wax ester synthase/acyl-CoA:diacylglycerol acyltransferase (WS/DGAT) activity plays a key role in both TAG and WE biosynthesis, whereas AtfA2 (ABO_1804) was dispensable for storage lipid formation. However, reduced but still substantial residual TAG levels in atfA1 and atfA2 knock-out mutants compellingly indicate the existence of a yet unknown WS/DGAT independent alternative TAG biosynthesis route. Storage lipids of A. borkumensis were enriched in saturated fatty acids and were accumulated as insoluble intracytoplasmic inclusions exhibiting a huge structurally variety. Storage lipid accumulation provided only a slight growth advantage during short-term starvation periods but was not required for maintaining viability and long-term persistence during extended starvation phases.**

R. Kalscheuer, T. Stöveken, U. Malkus, R. Reichelt, P.N. Golyshin, J.S. Sabirova, M. Ferrer, K.N. Timmis, A. Steinbüchel. J. Bacteriol. 189(3)(2007) 918-928

[more…] [back]

### Nanobiotechnology of Biomimetic Membranes


**This book is focussed on the lipid membrane, since that structure is a key component of the ways that living cells are able to maintain and organise their functions. Unlocking the secrets of those membranes provides important lessons that are valuable in guiding the construction of devices to be used for medical applications. That philosophy is a central theme for scientists and engineers working in the field of biomimetics. Indeed, throughout this book we emphasise that approach in order to define the discipline of nanobiotechnology.**

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