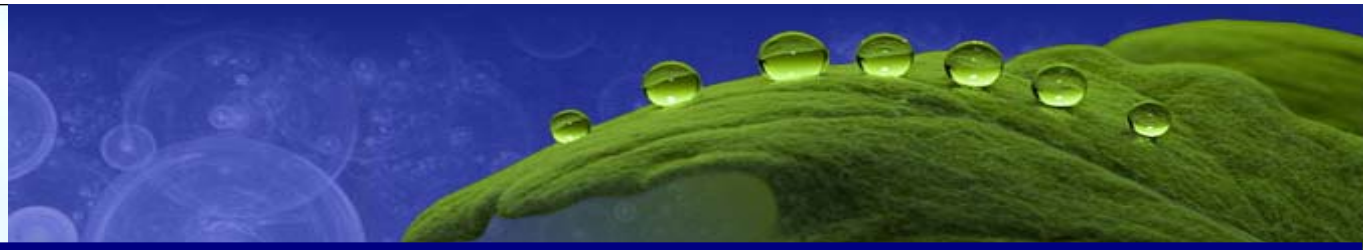
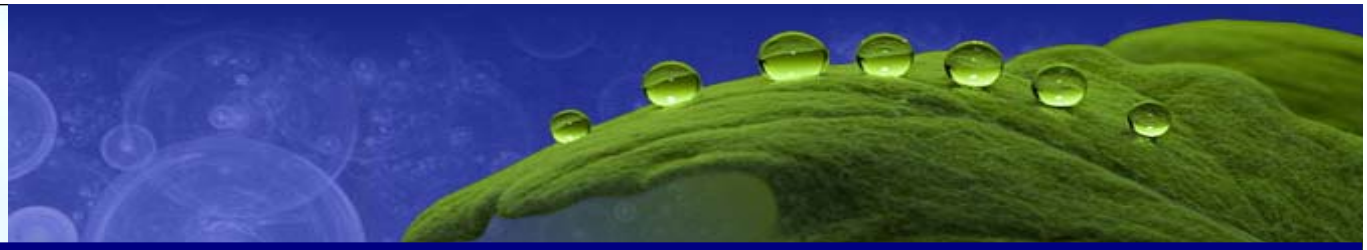


LbL Technology in industrial applications

Particles 2009 Berlin

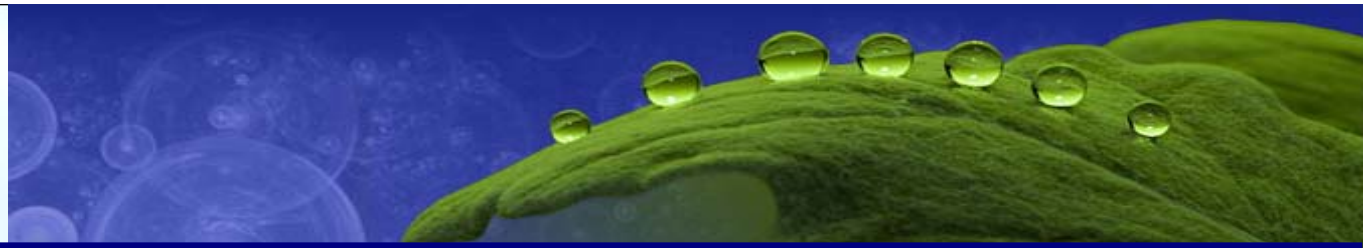
Lars Dähne

Surflay Nanotec GmbH Berlin



The Company

- Surflay (Surface Layers) founded 2008 Berlin
- Based on Layer-by-Layer (LbL) Technology
- Spin-Off from Capsulution Nanoscience AG
- Splitting of activities in Pharma-Applications (Capsulution) and None-Pharma (Surflay)
- Licence on relevant patents of MPG and Caps.



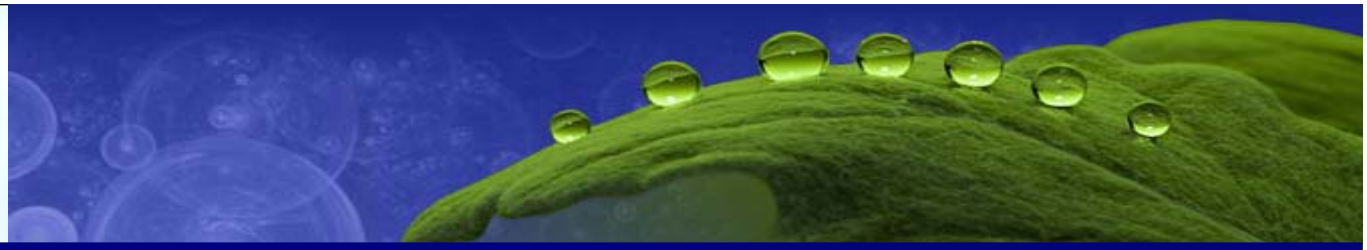
Interdisciplinary Team

Administration

Dr. habil Lars Dähne (CEO)
Dr. Claudia Aldenhoven (Biology)

Research & Development

Dr. Lars Dähne (Phys. Chemistry)
Dr. Gabriella Egri (Biotechnology)
Dr. Zhongbing Huang (Org. Chemistry)
Dipl. Ing. Jing Kang (Material Science)
Barbara Baude (Chem. Techn. Ass.)
Moritz Klickermann (Chemical Ingenieur)



The Technology

Specialized on coating of colloidal and planar surfaces for material functionalization.

Key technology

LbL-Technology with functionalized polyelectrolytes and nanoparticles.

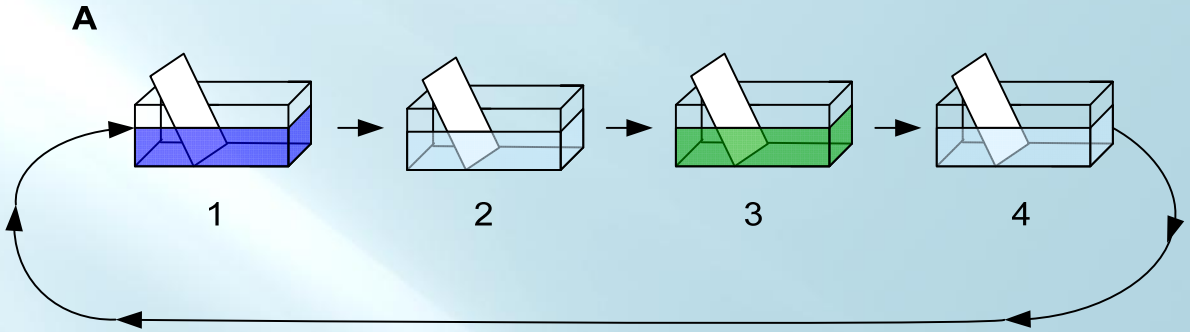
Application fields

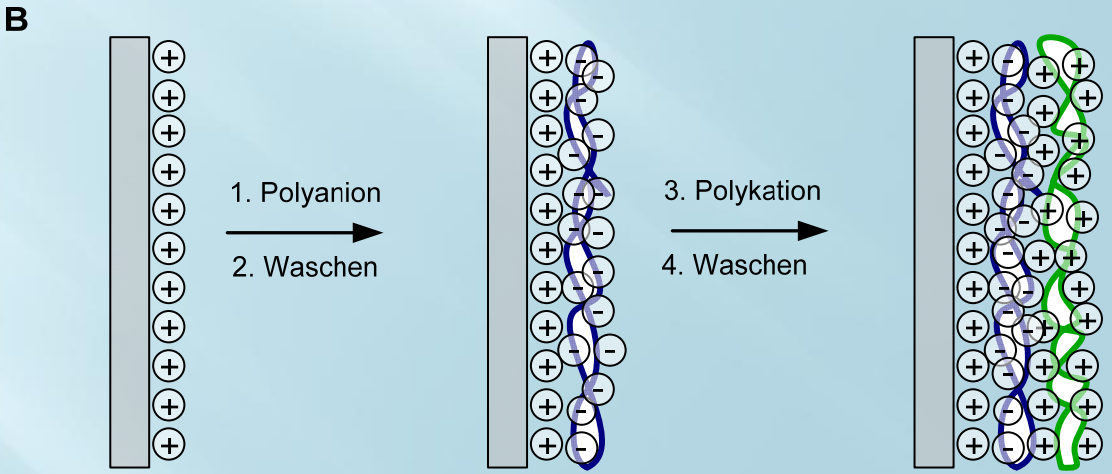
Specific separation materials

Pigment stabilization

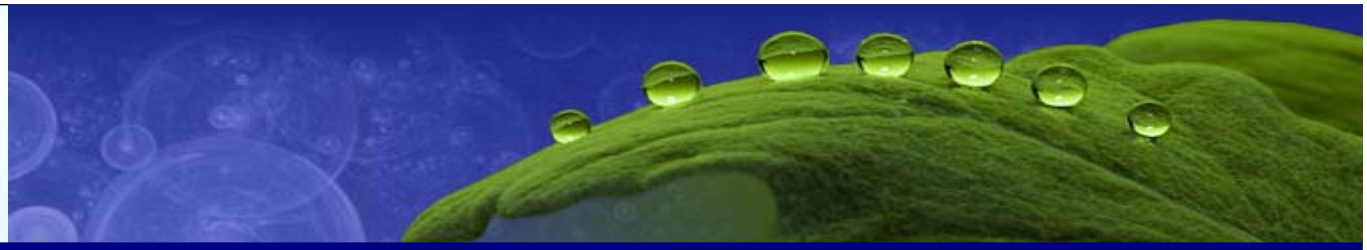
Sensoric and diagnostic Particles.

LbL-Technology





Conc. 1 g/L



Products

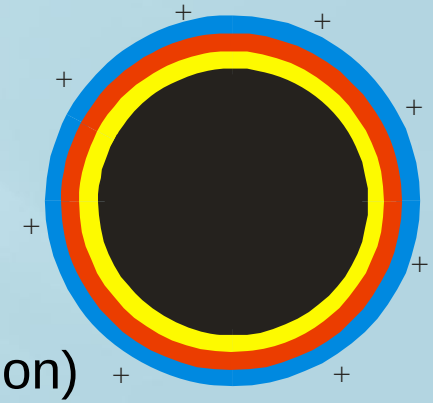
- **Functionalized particles (fluorescence, magnetic, biozide, enzymatic, DNA specific etc.)**
- **Encapsulated macromolecules and hydrophobic materials**
- **Ultrasound contrast agents (Microbubbles)**
- **Polyelectrolyte capsules 200 nm – 20 µm**
- **Labelled polyelectrolytes**

Examples of Industrial developments with LbL

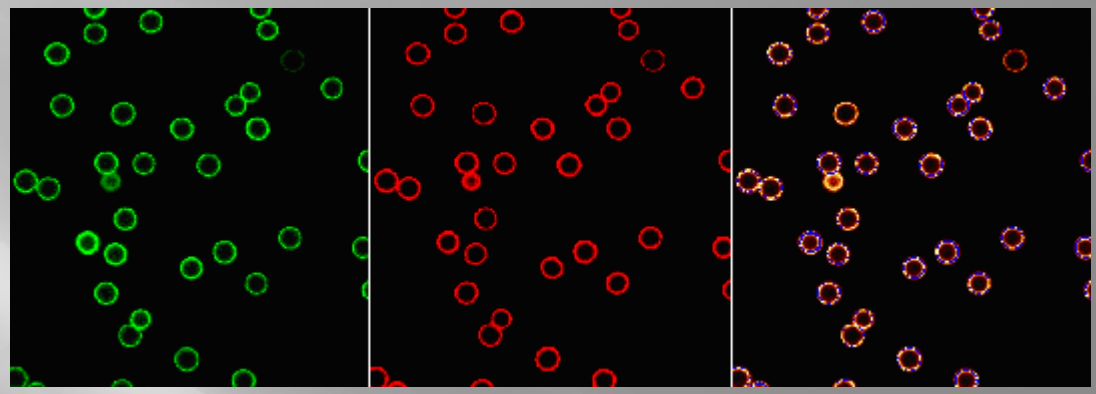
- Plant protection Particles against miner moths

Possible Capsule Solution:

- Sticking Layer
- Appetizer
- Pheromones
- Insectizide (release during digestion)



Oligonucleotid Beads



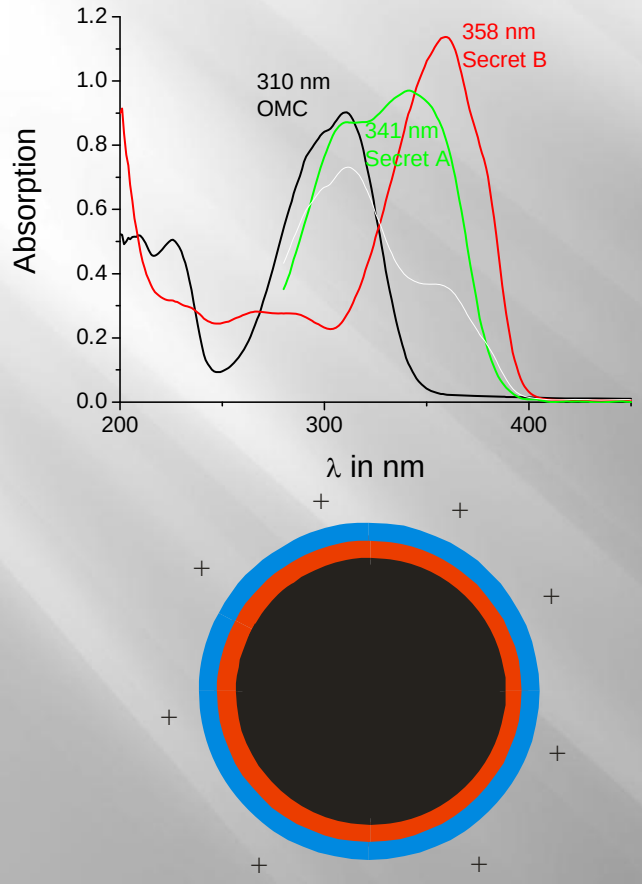
Magnetic Beads with specific Oligonucleotide sequence

Outermost layer labelled with FRET-Donor

Detection of hybridization by FRET-Signal (Acceptor-DNA)

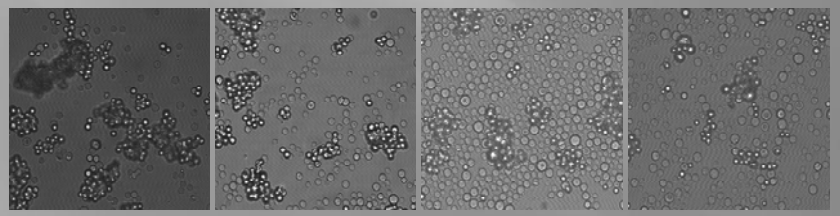
High hybridization capacity due to nanoporosity of LbL

Sun protection

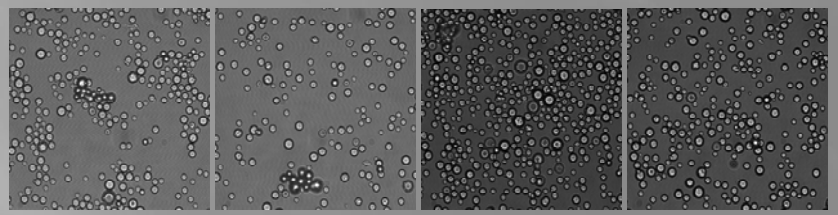


OMC (o-Methoxycinnamate, oil) causes strong radical formation after penetrating the skin → accelerated aging, cancer

Solution: oil encapsulation in 5 µm beads

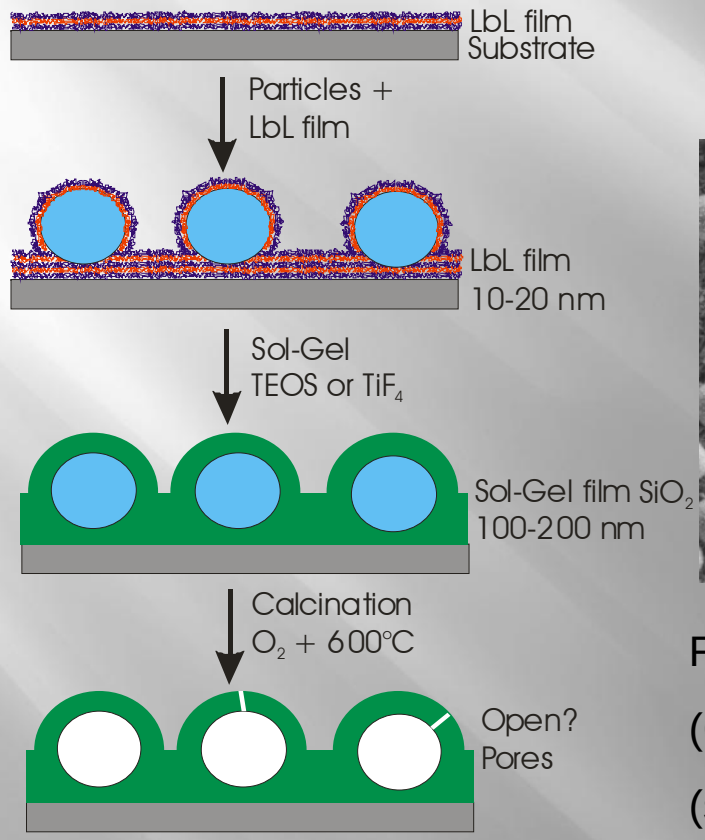


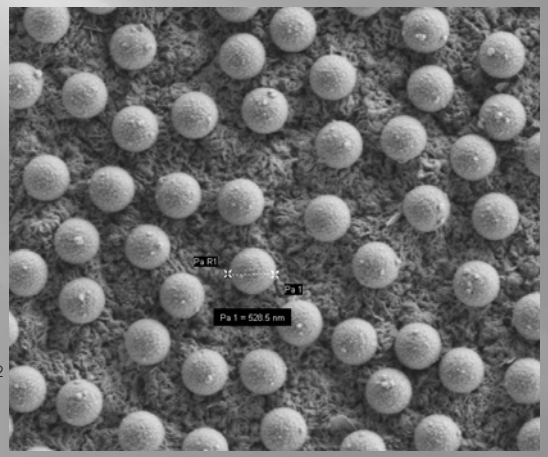
a) EP 6.1 1layer b) EP 6.2 c) EP 6.3 d) EP 6.4



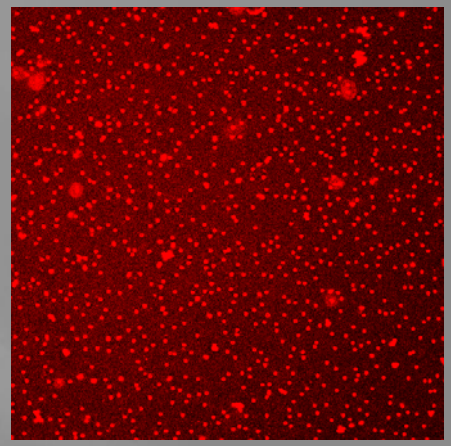
e) EP 6.5 f) EP 6.6 g) EP 6.7 h) EP 6.8

Drug reservoirs on stent surfaces



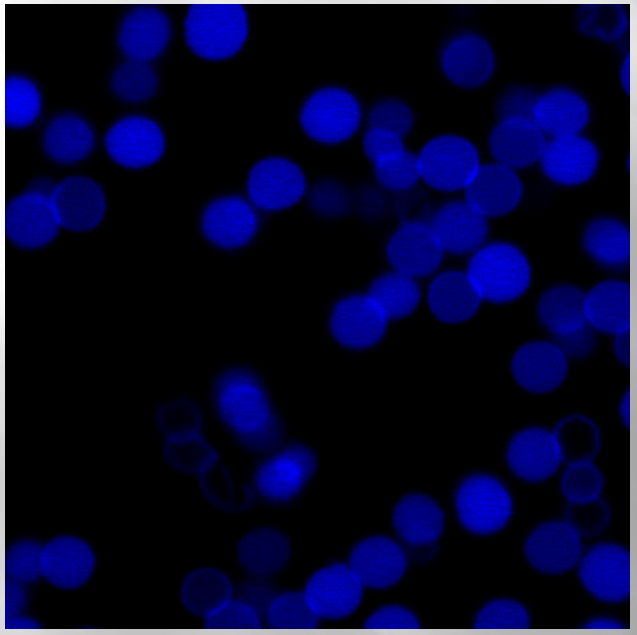


REM-image of calcinated (600°C) Sol-Gel-sample (size 15 µm x 15 µm

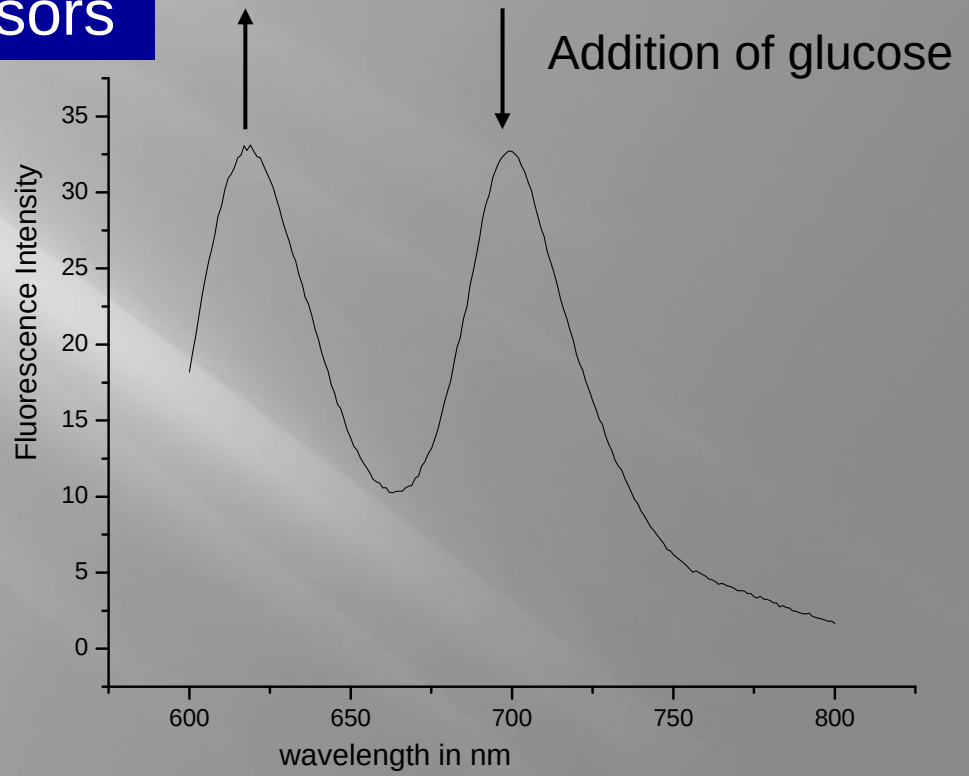


Confocal image model drug filled pores

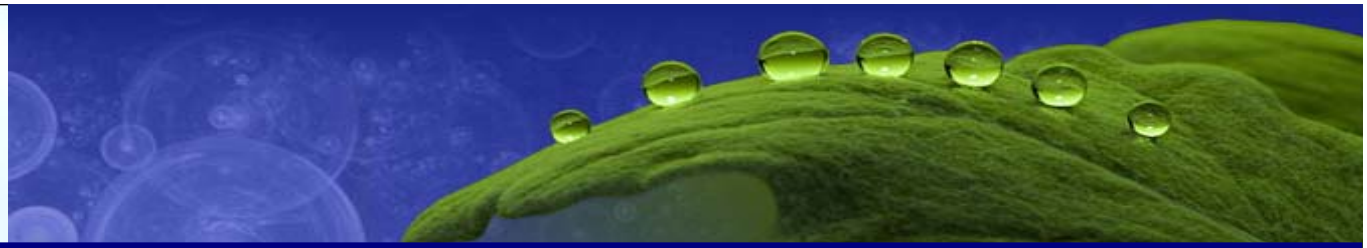
Reversible micro glucose sensors



4 μm capsules filled with ConA-DyeA Dextrane-Dye B Complex + glucose release of dextrane



Fluorescence spectra of microsensor-capsules λ_{exc} = 585 nm



Our partners

QIAGEN

Capsulution

micro particles GmbH

UNIVERSITÄT BAYREUTH

EMC microcollections

HUMBOLDT-UNIVERSITÄT ZU BERLIN

BAM Bundesanstalt für Materialforschung und -prüfung

SÜD-CHEMIE CREATING PERFORMANCE TECHNOLOGY

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