

## Polymer Microstructures

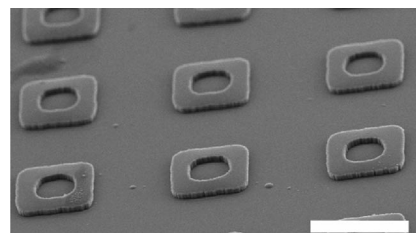
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### Fabrication of Particulate Reservoir-Containing, Capsulelike, and Self-Folding Polymer Microstructures for Drug Delivery

Small

DOI: 10.1002/smll.200600240

**Particulate polymer microdevices** are fabricated using protocols based on a transfer-molding process that allows the controlled assembly of multiple materials to produce functional devices. Specifically, protocols for reservoir-containing (see image; scale bar = 100  $\mu\text{m}$ ), capsulelike, and self-folding polymer microdevices are presented. The encapsulated materials are not exposed to high temperatures or caustic solutions, which is important in drug-delivery applications.



## DNA Sensors

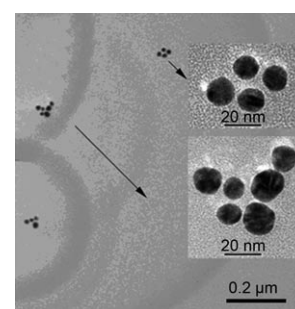
M. K. Beissenhirtz, R. Elnathan, Y. Weizmann, I. Willner\*

### The Aggregation of Au Nanoparticles by an Autonomous DNA Machine Detects Viruses

Small

DOI: 10.1002/smll.200600450

**Virus scanner:** A DNA-based machine that performs a mechanical operation, such as scission or replication, can be used to stimulate the aggregation of Au NPs (see TEM image). The process allows the colorimetric imaging of the machine functions and the optical read-out of DNA biosensing, with a sensitivity limit corresponding to  $1 \times 10^{-12}$  M.



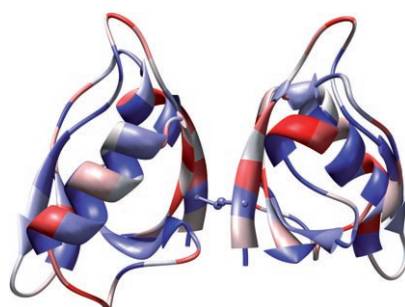
## Peptide Chemistry

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### Bivalent Peptides as Models for Multimeric Targets of PDZ Domains

ChemBioChem

DOI: 10.1002/cbic.200600389



**The power of two.** Dimerization of ligands that interact with dimeric proteins or proteins that contain multiple binding sites seems to be a preferred scenario for enhancing affinity in large signaling complexes. We used poly(ethylene glycol) cross-linked peptides to study dimer-dimer interactions mediated by PDZ domains. Such bivalent peptides bind significantly more strongly to PDZ domains compared to their monovalent relatives, and are easy to synthesize.

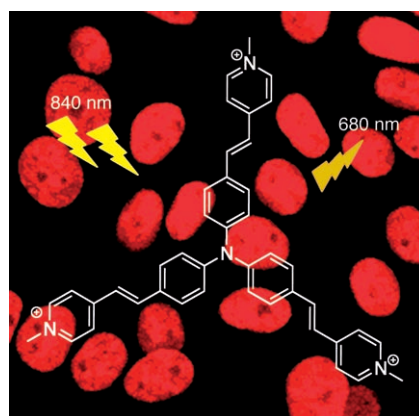
## Imaging Agents

C. Allain, F. Schmidt, R. Lartia, G. Bordeau, C. Fiorini-Debuisschert, F. Charra, P. Tauc, M.-P. Teulade-Fichou\*

### Vinyl-Pyridinium Triphenylamines: Novel Far-Red Emitters with High Photostability and Two-Photon Absorption Properties for Staining DNA

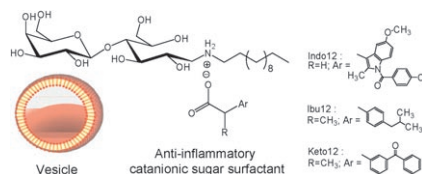
ChemBioChem

DOI: 10.1002/cbic.200600483



**From IR to red:** Red light-emitting vinyl-triphenylamines have been synthesised and evaluated for their two-photon absorption properties. These compounds proved to be excellent on/off probes that fluoresce only in the DNA matrix. Their large 2PA cross sections allow imaging of nuclear DNA with excellent contrast and brightness on IR excitation.

**Anti-inflammatory cationic sugar surfactants:** A cationic assembly (shown here) was developed that associates a sugar-based surfactant with a NSAID. The cationic vesicles ensured a slower diffusion of the NSAID through the skin and could be a promising dermal delivery system for NSAIDs in the course of skin inflammation treatment.

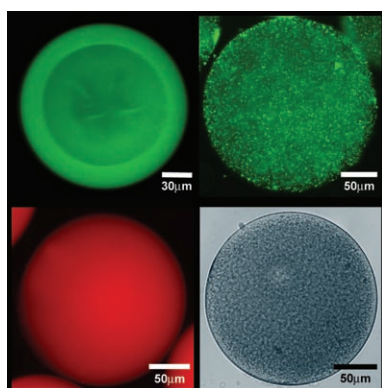


S. Consola, M. Blanzat, E. Perez, J.-C. Garrigues, P. Bordat, I. Rico-Lattes\*

### Design of Original Bioactive Formulations Based on Sugar-Surfactant/Non-steroidal Anti-inflammatory Cationic Self-Assemblies: A New Way of Dermal Drug Delivery

Chem. Eur. J.

DOI: 10.1002/chem.200601449



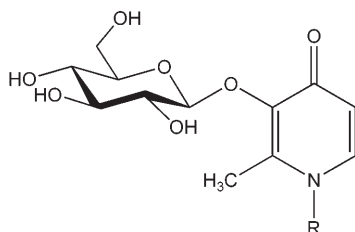
**Microgel structures** such as spherical microgel shells (picture on the upper left) and spherical microgel particles that incorporate quantum dots, magnetic nanoparticles, and polymer micro-particles (other images) have been prepared by a capillary microfluidic technique. Because these particles change their volume with changes in temperature, they may find application in, for example, drug delivery.

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### Fabrication of Monodisperse Gel Shells and Functional Microgels in Microfluidic Devices

Angew. Chem. Int. Ed.

DOI: 10.1002/anie.200604206



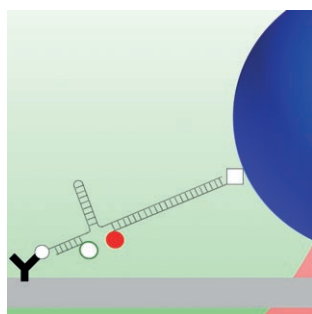
**A trifunctional approach:** 3-hydroxy-4-pyridinones that contain phenol groups for antioxidant functionality are further elaborated with pendant glucosyl moieties for improved blood-brain barrier targeting (see structure; R = phenyl, 4-hydroxyphenyl). Glycosidase removal of the carbohydrate substituents gives ligands that are ready to passivate excess metal ions, especially copper and zinc, in the brain. These molecules are potential prodrugs for treatment of neurodegenerative diseases, including Alzheimer's disease.

H. Schugar,\* D. E. Green, M. L. Bowen, L. E. Scott, T. Storr, K. Böhmerle, F. Thomas, D. D. Allen, P. R. Lockman, M. Merkel, K. H. Thompson, C. Orvig\*

### Combating Alzheimer's Disease With Multifunctional Molecules Designed for Metal Passivation

Angew. Chem. Int. Ed.

DOI: 10.1002/anie.200603866



**Don't FRET:** The first successful combination of optical-tweezers force microscopy and single-molecule fluorescence resonant energy transfer (FRET) is demonstrated with a force sensor based on a DNA hairpin (see picture): as the hairpin is opened and closed by the optical tweezers, the structural change is simultaneously monitored by the FRET emission from fluorescence labels.

P. B. Tarsa, R. R. Brau, M. Barch, J. M. Ferrer, Y. Freyzon, P. Matsudaira, M. J. Lang\*

### Detecting Force-Induced Molecular Transitions with Fluorescence Resonant Energy Transfer

Angew. Chem. Int. Ed.

DOI: 10.1002/anie.200604546