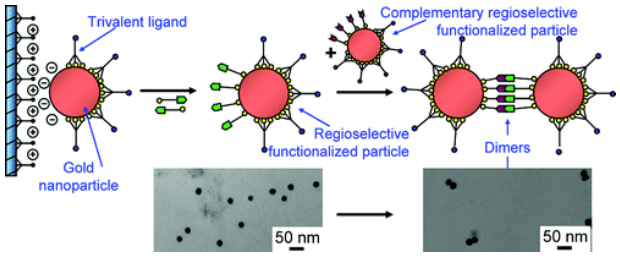
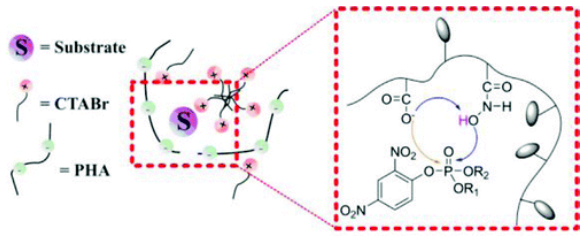
- Controlled Formation of Gold Nanoparticle Dimers Using Multivalent Thiol Ligands
  Hofmann, A.; Schmiel, P.; Stein, B.; Graf, C. *Langmuir* **2011**, *27*, 15165-15175.
  Abstract:



Approaches for the controlled formation of gold nanoparticle dimers are investigated. These are based on a locally confined surface modification of gold nanoparticles followed by bridging two particles with an organic linker. A key factor in these approaches is the use of multivalent ligands. Citrate-stabilized gold nanoparticles are immobilized on a glass surface and mono- and multivalent thiol ligands are investigated regarding their ability to inactivate the nanoparticles sites facing away from the glass. A successful locally confined functionalization is only possible if multivalent ligands are used in this step. The application of monovalent ligands results in less stable particles without a permanent regioselective functionalization. This result can be explained by the dynamic equilibrium between bound and free ligands. Subsequently, the sites of the nanoparticles previously bound to the glass surface are functionalized with thiol ligands additionally bearing a reactive group. Approaches using dithiol linkers, diamine linkers, and coupling complementary functionalized particles are investigated. The highest yield of stable dimers is obtained from conditions where nanoparticles which are regioselectively functionalized with an *N*-hydroxysuccinimide ester are reacted with complementary amino-functionalized particles. The application of nanoparticles with activated carboxyl groups is essential since standard carboxyl activation agents induce an aggregation of the nanoparticles due to a reaction with remaining citrate molecules on the nanoparticle surface which reduces significantly electrostatic stabilization. This versatile approach using complementary regioselective with multivalent ligands functionalized nanoparticles may be also used for the coupling of particles with different size, shape, or composition, as well as a control of the interparticle distance.

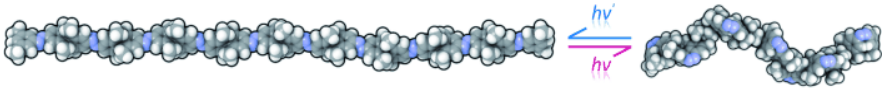
- Polymers Containing Hydroxamate Groups: Nanoreactors for Hydrolysis of Phosphoryl Esters
  Mello, R. S.; Orth, E. S.; Loh, W.; Fiedler, H. D.; Nome, F. *Langmuir* **2011**, *27*, 15112-15119.
  Abstract:



A polyhydroxamicalkanoate (PHA) polymer containing the functional groups hydroxamic acid and carboxylic acid with the ability to accelerate dephosphorylation reactions is proposed. The methodology used to prepare this polymer favored the position of the two functional groups next to each other, which allows for the cooperativity between these groups. This cooperative effect has an important role when one wants to mimic enzymes. The catalytic effect promoted by the polymer was evaluated on the cleavage of the bis(2,4-dinitrophenyl) phosphate (BDNPP) and diethyl 2,4-

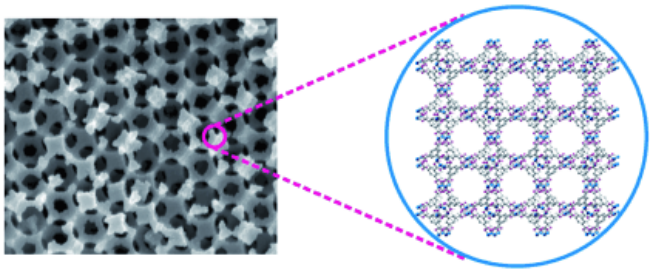
dinitrophenyl phosphate (DEDNPP) esters. Indeed, PHA was very efficient and promiscuous because it increased the rate of both reactions by a factor of up to 10^6-fold. Isothermal titration calorimetry (ITC) experiments showed that the presence of PHA aids the formation of cetyltrimethylammonium bromide (CTABr) micelles. Thus, the effect of the cationic surfactant CTABr on the dephosphorylation of BDNPP by PHA was also investigated, and it was observed that, when CTABr is added to PHA, the reaction is ca. 15-fold faster compared to the reaction when only PHA is present.

- Light-Orchestrated Macromolecular "Accordions": Reversible Photoinduced Shrinking of Rigid-Rod Polymers
  Bléger, D.; Liebig, T.; Thiermann, R.; Maskos, M.; Rabe, J. P.; Hecht, S. *Angew. Chem. Int. Ed.* **2011**, *50,* 12559–12563.
  Abstract:



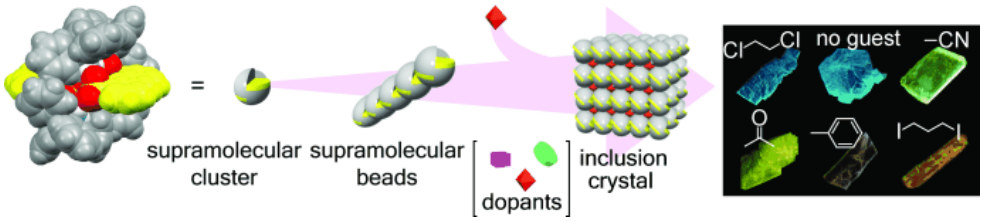
Light can play: Irradiation causes dramatic changes in the shape of rigid-rod polymers incorporating azobenzene photochromes in the main chain. The embedded photoswitches act as hinges, which upon light-induced isomerization lead to reversible shrinking and stretching of the polymer backbone (see scheme), resembling light-orchestrated macromolecular accordions.

- Metal–Organic Frameworks with a Three-Dimensional Ordered Macroporous Structure: Dynamic Photonic Materials
  Wu, Y.; Li, F.; Zhu, W.; Cui, J.; Tao, Lin, C.; Hannam, P. M.; Li, G. *Angew. Chem. Int. Ed.* **2011**, *50,* 12518–12522.
  Abstract:



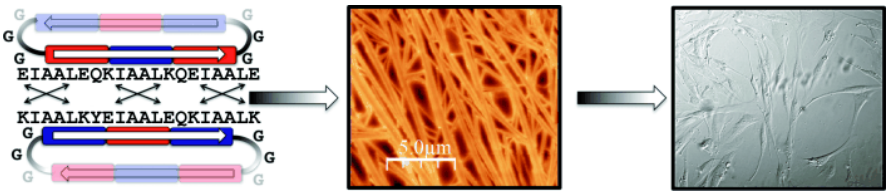
Tuning MOFs: When a metal–organic framework (MOF) with an ordered three-dimensional macroporous structure is integrated into a film, the resulting materials have an additional optical element, which can be used as a general and effective signal transducer. This, in combination with the hierarchical pore structure, makes these films interesting dynamic photonic materials with potential applications in sensors.

- Guest-Responsive Fluorescence of Inclusion Crystals with π-Stacked Supramolecular Beads
  Hinoue, T.; Miyata, M.; Hisaki, I.; Tohnai, N. *Angew. Chem. Int. Ed.* **2012**, *51*, 155–158.
  Abstract:



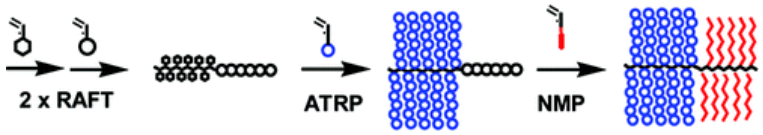
Luminescent jewels: Unusually shaped fluorescent supramolecular clusters assemble into one-dimensional π-stacked supramolecular beads to eventually crystallize with a wide range of solvent molecules (see picture). The included solvent molecules modulate the fluorescence colors of the inclusion crystals from blue to orange-yellow as is known for the colors of gemstones.

- Arbitrary Self-Assembly of Peptide Extracellular Microscopic Matrices
  Bella, A.; Ray, S.; Shaw, M.; Ryadnov, M. G. *Angew. Chem., Int. Ed.* **2012** *51*, 428-431.
  Abstract:



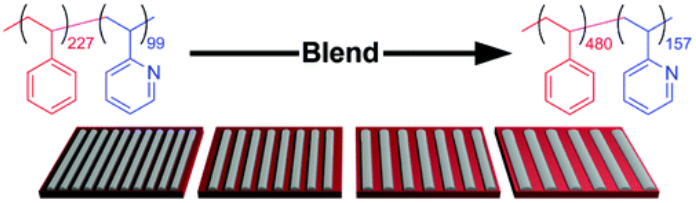
Two faces for one matrix: A single bifaceted cyclopeptide block forms highly branched, porous, and intricate fibrillar networks, which span microscopic dimensions and mimic the extracellular matrix to support cell growth and proliferation (see picture). The peptide block has two domains connected with triglycine linkers (GGG); the domains consist of positively (blue) and negatively (red) charged heptads that provide interactions between different blocks.

- Straightforward Access to Amphiphilic Dual Bottle Brushes by Combining RAFT, ATRP, and NMP Polymerization in One Sequence
  Zehm, D.; Laschewsky, A.; Liang, H.; Rabe, J. P. *Macromolecules* **2011,** *44,* 9635–9641.
  Abstract:



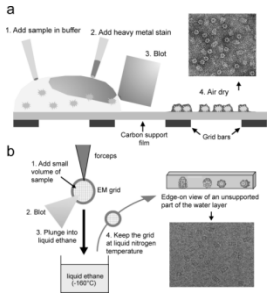
Molecular brush diblock copolymers were synthesized by the orthogonal overlay of the RAFT (reversible addition–fragmentation chain transfer), the ATRP (atom transfer radical polymerization), and the NMP (nitroxide-mediated polymerization) techniques. This unique combination enabled the synthesis of the complex amphiphilic polymers without the need of postpolymerization modifications, using a diblock copolymer intermediate made from two selectively addressable inimers and applying a sequence of four controlled free radical polymerization steps in total. The resulting polymers are composed of a thermosensitivepoly(N-isopropylacrylamide) brush as hydrophilic block and a polystyrene brush as hydrophobic block, thus translating the structure of the established amphiphilicdiblock copolymers known as macro surfactants to the higher size level of "giant surfactants". The dual molecular brushes and the aggregates formed on ultra flat solid substrates were visualized by scanning force microscopy (SFM).

- Rapid Assembly of Nanolines with Precisely Controlled Spacing from Binary Blends of Block Copolymers
  Zhang, X.; Murphy, J. N.; Wu, N. L. Y.; Harris, K. D.; Buriak, J. M. *Macromolecules* **2011**, *44*, 9752–9757.
  Abstract:



Thin films cast from binary blends of structurally homologous polystyrene-block-poly(2-vinylpyridine) polymers were used to obtain horizontal arrays of linear nanostructures which were visualized by metallizing the poly(2-vinylpyridine) blocks with a tetrachloroplatinate salt. By varying the blend compositions of the homologous block copolymers, fine control over the periodicity of lines was realized from 25 to 55 nm using a set of just 4 block copolymers. For neat block copolymers whose equilibrium structures are not horizontal cylinders, blending enabled cylindrical structures to form. The ordering in various films was studied by measurements of defect density, and it was found that in many cases blended films produced patterns of lower defect density than patterns formed from single component block copolymers. Annealing of the polymer films was carried out using a solvothermal microwave annealing technique able to rapidly produce few-defect films. Here the technique is adapted to use a household microwave oven (cost < $100) to rapidly induce self-assembly in under 2 min, enabling broad accessibility.

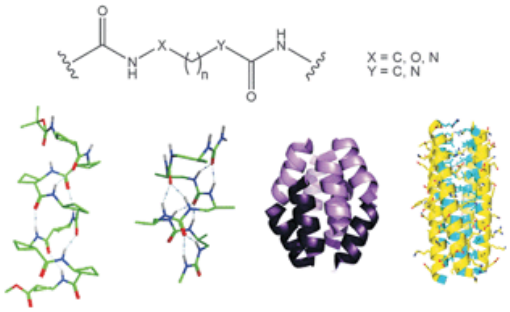
- Structural Analysis of Macromolecular Assemblies by Electron Microscopy
  Orlova, E. V.; Saibil, H. R. *Chem. Rev.* **2011,** *111,* 7710–7748.
  Abstract:



To fully understand biological processes from the metabolism of a bacterium to the operation of a human brain, it is necessary to know the three-dimensional (3D) spatial arrangement and dynamics of the constituent molecules, how they assemble into complex molecular machines, and how they form functional organelles, cells, and tissues. The methods of X-ray crystallography and NMR spectroscopy can provide detailed information on molecular structure and dynamics. At the cellular level, optical microscopy reveals the spatial distribution and dynamics of molecules tagged with fluorophores. Electron microscopy (EM) overlaps with these approaches, covering a broad range from atomic to cellular structures. The development of cryogenic methods has enabled EM imaging to provide snapshots of biological molecules and cells trapped in a close to native, hydrated state.

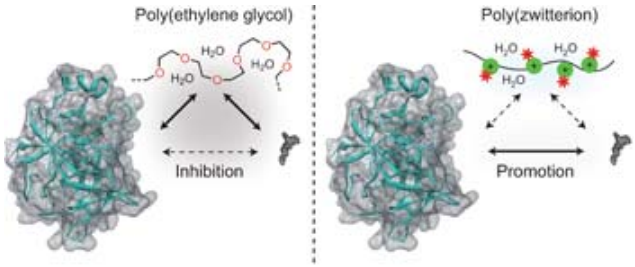
- Peptidic foldamers: ramping up diversity
  Martinek, T. A.; Fülöp, F. *Chem. Soc. Rev.* **2012**, *41*, 687-702.

Abstract:



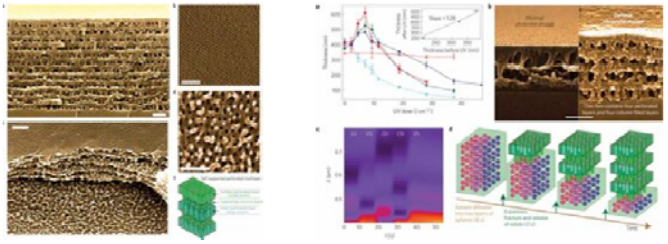
Non-natural folded polymers (foldamers) display considerable versatility, and the design of such molecules is of great current interest. In this respect, peptidic foldamers are perhaps the best-characterized systems, as they populate a number of residue-controlled secondary structures, which have found various biological applications and have also led to the creation of nanostructured materials. This *critical review* covers recent developments related to diverse building blocks and modern foldamer design principles, such as the stereochemical patterning methods. The recent achievements concerning tertiary/quaternary structures and the self-assembling foldameric nanostructures are also addressed (176 references).

- Poly(zwitterionic)protein conjugates offer increased stability without sacrificing binding affinity or bioactivity
  Keefe, A. J.; Jiang, S. *Nature Chem.* **2012**, *4*, 59–63.
  Abstract:



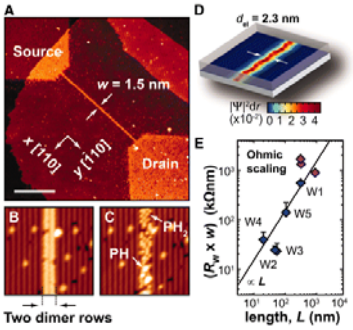
Treatment with therapeutic proteins is an attractive approach to targeting a number of challenging diseases. Unfortunately, the native proteins themselves are often unstable in physiological conditions, reducing bioavailability and therefore increasing the dose that is required. Conjugation with poly(ethylene glycol) (PEG) is often used to increase stability, but this has a detrimental effect on bioactivity. Here, we introduce conjugation with zwitterionic polymers such as poly(carboxybetaine). We show that poly(carboxybetaine) conjugation improves stability in a manner similar to PEGylation, but that the new conjugates retain or even improve the binding affinity as a result of enhanced protein–substrate hydrophobic interactions. This chemistry opens a new avenue for the development of protein therapeutics by avoiding the need to compromise between stability and affinity.

- Collective osmotic shock in ordered materials
  Zavala-Rivera, P.; Channon, K.; Nguyen, V.; Sivaniah, E.; Kabra, D.; Friend, R. H.; Nataraj, S. K.; Al-Muhtaseb, S. A.; Hexemer, A.; Calvo, M. E.; Miguez, H. *Nature Mater.* **2012**, *11*, 53-57.
  Abstract:



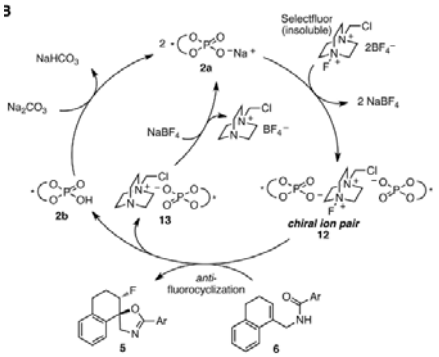
Osmotic shock in a vesicle or cell is the stress build-up and subsequent rupture of the phospholipid membrane that occurs when a relatively high concentration of salt is unable to cross the membrane and instead an inflow of water alleviates the salt concentration gradient. This is a well-known failure mechanism for cells and vesicles (for example, hypotonic shock) and metal alloys (for example, hydrogen embrittlement). We propose the concept of collective osmotic shock, whereby a coordinated explosive fracture resulting from multiplexing the singular effects of osmotic shock at discrete sites within an ordered material results in regular bicontinuous structures. The concept is demonstrated here using self-assembled block copolymer micelles, yet it is applicable to organized heterogeneous materials where a minority component can be selectively degraded and solvated whilst ensconced in a matrix capable of plastic deformation. We discuss the application of these self-supported, perforated multilayer materials in photonics, nanofiltration and optoelectronics.

- Ohm's Law Survives to the Atomic Scale
  Weber, B.; Mahapatra, S.; Ryu, H.; Lee, S.; Fuhrer, A.; Reusch, T. C. G.; Thompson, D. L.; Lee, W. C. T.; Klimeck, G.; Hollenberg, L. C. L.; Simmons, M. Y. *Science* **2012,** *335*, 64-67.
  Abstract:



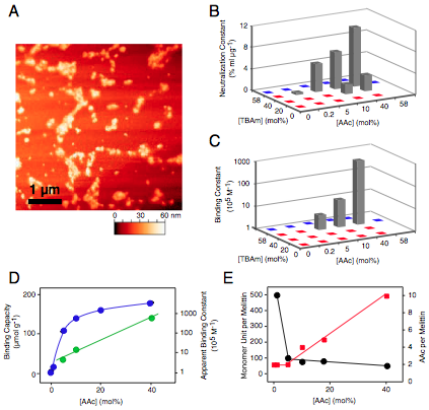
As silicon electronics approaches the atomic scale, interconnects and circuitry become comparable in size to the active device components. Maintaining low electrical resistivity at this scale is challenging because of the presence of confining surfaces and interfaces. We report on the fabrication of wires in silicon—only one atom tall and four atoms wide—with exceptionally low resistivity (~0.3 milliohm-centimeters) and the current-carrying capabilities of copper. By embedding phosphorus atoms within a silicon crystal with an average spacing of less than 1 nanometer, we achieved a diameter-independent resistivity, which demonstrates ohmic scaling to the atomic limit. Atomistic tight-binding calculations confirm the metallicity of these atomic-scale wires, which pave the way for single-atom device architectures for both classical and quantum information processing.

- Asymmetric Electrophilic Fluorination Using an Anionic Chiral Phase-Transfer Catalyst
  Rauniyar, V.; Lackner, A. D.; Hamilton, G. L.; Toste, D. F. *Science* **2011,** *334*, 1681-1684.
  Abstract:



The discovery of distinct modes of asymmetric catalysis has the potential to rapidly advance chemists' ability to build enantioenriched molecules. As an example, the use of chiral cation salts as phase-transfer catalysts for anionic reagents has enabled a vast set of enantioselective transformations. Here, we present evidence that a largely overlooked analogous mechanism wherein a chiral anionic catalyst brings a cationic species into solution is itself a powerful method. The concept is applied to the enantioselective fluorocyclization of olefins with a cationic fluorinating agent and a chiral phosphate catalyst. The reactions proceed in high yield and stereoselectivity, especially considering the scarcity of alternative approaches. This technology can in principle be applied to the large portion of reaction space that uses positively charged reagents and reaction intermediates.

- The rational design of a synthetic polymer nanoparticle that neutralizes a toxic peptide in vivo.
  Hoshino, Y.; Koide, H.; Furuya, K.; Haberaecker, W. W.; Lee, S.-H.; Kodama, T.; Kanazawa, H.; Oku, N.; Shea, K. J. *Proc. Natl. Acad. Sci. U. S. A.* **2012,** *109*, 33-38.
  <u>Abstract:</u>



Synthetic polymer nanoparticles (NPs) that bind venomous molecules and neutralize their function in vivo are of significant interest as "plastic antidotes." Recently, procedures to synthesize polymer NPs with affinity for target peptides have been reported. However, the performance of synthetic materials in vivo is a far greater challenge. Particle size, surface charge, and hydrophobicity affect not only the binding affinity and capacity to the target toxin but also the toxicity of NPs and the creation of a "corona" of proteins around NPs that can alter and or suppress the intended performance. Here, we report the design rationale of a plastic antidote for in vivo applications. Optimizing the choice and ratio of functional monomers incorporated in the NP maximized the binding affinity and capacity toward a target peptide. Biocompatibility tests of the NPs in vitro and in vivo revealed the importance of tuning surface charge and hydrophobicity to minimize NP toxicity and prevent

aggregation induced by nonspecific interactions with plasma proteins. The toxin neutralization capacity of NPs in vivo showed a strong correlation with binding affinity and capacity in vitro. Furthermore, in vivo imaging experiments established the NPs accelerate clearance of the toxic peptide and eventually accumulate in macrophages in the liver. These results provide a platform to design plastic antidotes and reveal the potential and possible limitations of using synthetic polymer nanoparticles as plastic antidotes.

- Nickel-borate oxygen-evolving catalyst that functions under benign conditions.
  Dincă, M.; Surendranath, Y.; Nocera, D. G. *Proc. Natl. Acad. Sci. U. S. A.* **2010,** *107*, 10337-10341.
  Abstract :

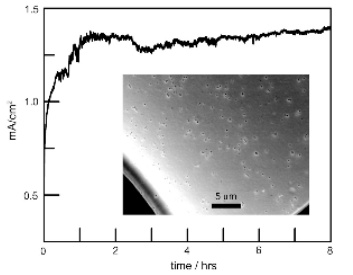
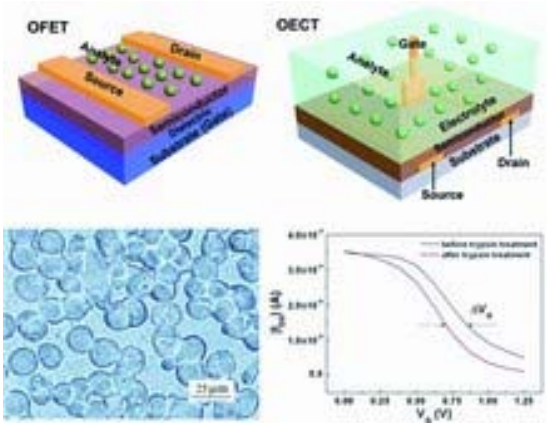


Fig. 3. Current density trace for bulk electrolysis at 1.30 V in 0.1 M B_i electrolyte, pH 9.2, 1 mM Ni^{2+} using an ITO anode. Irregularities are due to bubble formation and to stirring. The inset shows an SEM photograph of a film obtained by passing 10 C/cm² at 1.30 V.

Thin catalyst films with electrocatalytic water oxidation properties similar to those of a recently reported Co-based catalyst can be electrodeposited from dilute Ni2+ solutions in borate electrolyte at pH 9.2 (Bi). The Ni-Bi films can be prepared with precise thickness control and operate at modest overpotential providing an alternative to the Co catalyst for applications in solar energy conversion.

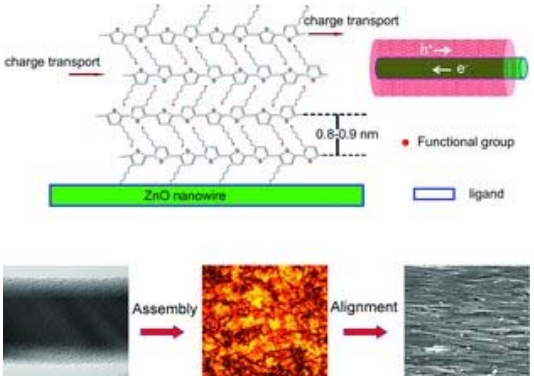
- Organic Thin-Film Transistors for Chemical and Biological Sensing
  Lin, P.; Yan, F. Ad*v. Mat.* **2012,** *24,* 34-51.
  Abstract:



Organic thin-film transistors (OTFTs) show promising applications in various chemical and biological sensors. The advantages of OTFT-based sensors include high sensitivity, low cost, easy fabrication, flexibility and biocompatibility. In this paper, we review the chemical sensors and biosensors based on two types of OTFTs, including organic field-effect transistors (OFETs) and organic electrochemical transistors (OECTs), mainly focusing on the papers published in the past 10 years. Various types of OTFT-based sensors, including pH, ion, glucose, DNA, enzyme, antibody-antigen, cell-based sensors, dopamine sensor, etc., are classified and described in the paper in sequence. The sensing

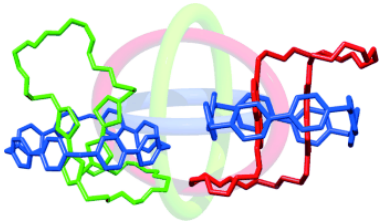
mechanisms and the detection limits of the devices are described in details. It is expected that OTFTs may have more important applications in chemical and biological sensing with the development of organic electronics.

- Directed Self-Assembly of Hybrid Oxide/Polymer Core/Shell Nanowires with Transport Optimized Morphology for Photovoltaics
  Zhang, S.; Pelligra, C. I.; Keskar, G.; Jiang, J.; Majewski, P. W.; Taylor, A. D.; Beigi, S. I.; Pfefferle, L. D.; Osuji C. O. Adv. *Mat.* **2012**, *24, 82-87*,
  Abstract:



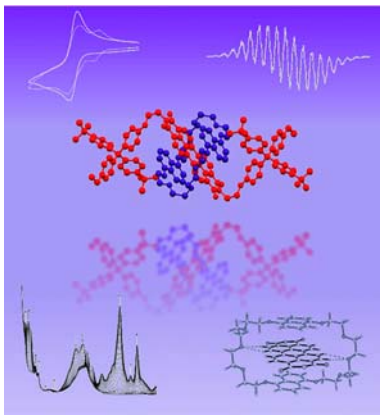
An entirely bottom-up approach for the preparation of liquid crystalline suspensions of core-shell nanowires for ordered bulk heterojunction photovoltaics is demonstrated. Side-on attachment of polythiophene derivatives to ZnO nanowires promotes a co-axial polymer backbone-nanowire arrangement which favors high hole mobility. This strategy offers structural control over multiple length scales and a viable means of fabricating ordered films over large areas.

- Donor–Acceptor Ring-in-Ring Complexes
  Forgan, R. S.; Wang, C.; Friedman, D. C.; Spruell, J. M.; Stern, C. L.; Sarjeant, A. A.; Cao, D.; Stoddart, J. F. *Chem. Eur. J.* **2012**, *18*, 202-212.
  Abstract:



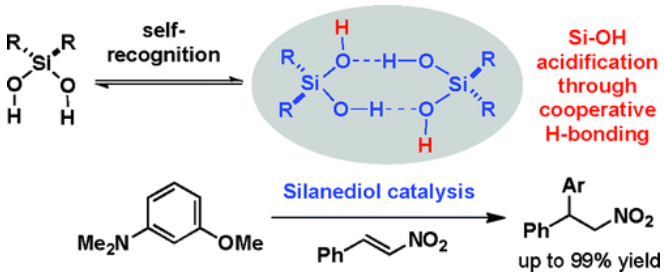
Ringing the changes: Three donor–acceptor ring-in-ring complexes have been prepared as intermediates in the stepwise synthesis of molecular Borromean rings (see figure). Characterization of the complexes in the solution and solid states reveals their stabilities are dictated by CH···O contacts as well as by donor–acceptor interactions.

- A PeryleneDiimide Rotaxane: Synthesis, Structure and Electrochemically Driven De-Threading
  Slater, B. J.; Davies, E. S.; Argent, S. P.; Nowell, H.; Lewis, W.; Blake, A. J.; Champness, N. R. *Chem. Eur. J.* **2011**, *17*, 14746-14751.
  Abstract:



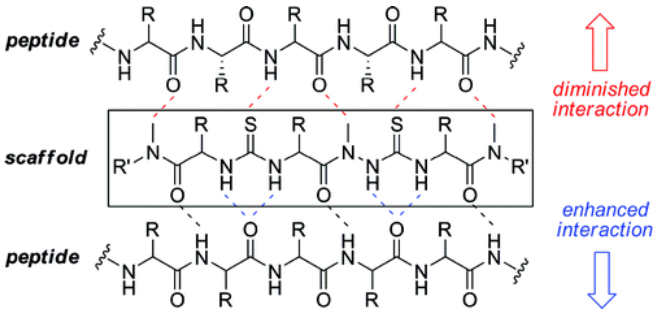
Perylenediimides make excellent building blocks for the formation of [2]-rotaxanes. The rich electrochemistry of the perylene-based recognition site facilitates a pathway to different oxidation states and properties and allows a mechanism for electrochemically driven de-treading of the interlocked species (see figure).

- Cooperative Hydrogen-Bonding Effects in Silanediol Catalysis
  Tran, N. T.; Wilson, S. O.; Franz, A. K. *Org. Lett.* **2012,** *14*, 186–189.
  Abstract:



The importance of cooperative hydrogen-bonding effects and SiOH-acidification is described for silanediol catalysis. NMR binding, X-ray, and computational studies provide support for a unique dimer resulting from silanediol self-recognition. The significance of this cooperative hydrogen-bonding is demonstrated using novel fluorinated silanediol catalysts for the addition of indoles and N,N-dimethyl-m-anisidine to trans-β-nitrostyrene.

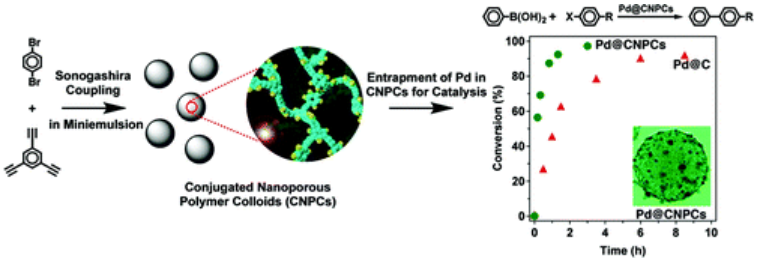
- Synthesis of a New Class of Bis(thiourea)hydrazide Pseudopeptides as Potential Inhibitors of β-Sheet Aggregation
  Klein, J. J.; Hecht, S. *Org. Lett.* **2012**, *14*, 330–333.
  Abstract:



The modular synthesis of a novel pseudopeptide scaffold based on a bis(thiourea)hydrazide motif is reported. This compound class is designed to display “amphifinity”, i.e. association with a peptide

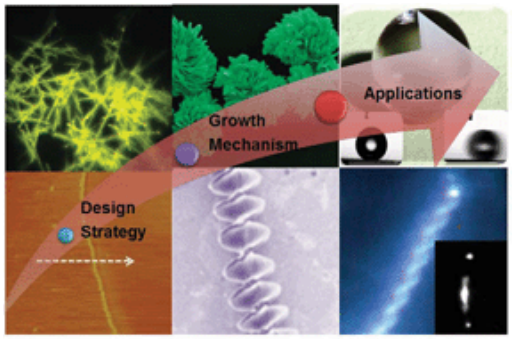
strand on one but not the other face of the scaffold, and hence could potentially inhibit β-sheet aggregation.

- Solution-Dispersible, colloidal, conjugated porous polymer networks with entrapped palladium nanocrystals for heterogeneous catalysis of the Suzuki-Miyaura coupling reaction
  Zhang, P.; Weng, Z.; Guo, J.; Wang, C. *Chem. Mater.* **2011,** *23*, 5243-5249.
  Abstract:



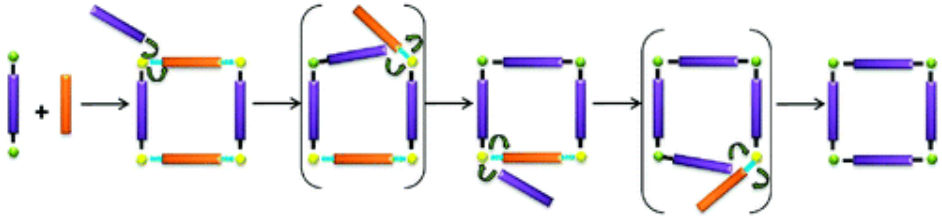
Conjugated nanoporous polymer colloids (CNPCs) consisting of covalently cross-linked poly(*p*-phenyleneethynylene) networks were synthesized by using the Sonogashira coupling reaction in a toluene-in-water miniemulsion. The synthesized CNPCs having a uniform particle size distribution exhibit high porosity with a specific surface area of 421 m^2/g and a dual distribution of pore size in the micropore and mesopore ranges. They are amenable to postfunctionalization and enhancement of their dispersibility in solvents, and retain their native photoluminescence. The modified CNPCs allow for in situ incorporation of palladium nanocrystals to form the Pd@CNPC composite materials. The Pd@CNPCs are validated to have excellent catalytic activity, outstanding reusability, and exceptionally high TOF (44100 h^{-1}) for the Suzuki-Miyaura coupling reaction.

- Solution-processed organic nano- and micro-materials: design strategy, growth mechanism and applications
  Lei, T.; Pei, J. *J. Mater. Chem.* **2012**, *22*, 785-798.
  Abstract:



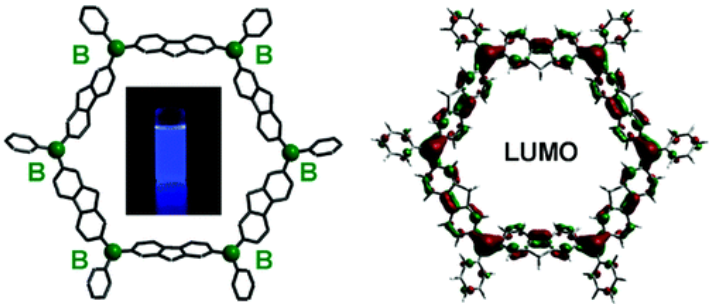
Recently many efforts have been devoted to the investigation of organic nano- and micro-materials due to their unique properties and broad applications in organic field-effect transistors, organic light-emitting diodes, organic photovoltaics, photodetectors and superhydrophobic materials. In comparison with physical vapour deposition, solution processing provides a more convenient and cost-effective approach to obtain organic nano- and micro-materials with various morphologies, including wires, sheets and flowers. In this review, we use the basic concepts of supramolecular chemistry to discuss the molecular design strategy and growth mechanisms of various organic nano- and micro-structures, and their relationship with the corresponding applications.

- Covalent Stabilization: A Sturdy Molecular Square from Reversible Metal-Ion-Directed Self-Assembly
  Olive, A.G. L.; Parkan, K.; Givelet, C.; Michl, J. *J.Am. Chem. Soc.* **2011**, *133*, 20108–20111.
  Abstract:



Supramolecular self-assembly using weak interactions under quasi-equilibrium conditions has provided easy access to very complex but often quite fragile molecules. Wenow show how a labile structure obtained from reversible transition-metal-directed self-assembly of rods and connectors serves as a template that can be converted into a sturdy structure of identical topology and similar geometry. The process consists of Cu(I)-catalyzed replacement of all rods or connectors terminated with pyridines for analogues terminated with ethynyls, converting dative N→Pt^{+} bonds into covalent C–Pt bonds. The procedure combines the facility and high yield of reversible self-assembly with the robustness of covalent synthesis.

- Highly Luminescent, Electron-Deficient Bora-cyclophanes
  Chen, P.; Jäkle, F. *J. Am. Chem. Soc.* **2011**, *133*, 20142–20145.
  Abstract:



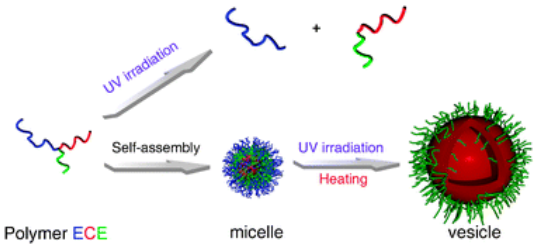
A highly luminescent conjugated organ oboron macrocycle containing six Lewis acidicboron centers was synthesized. Comparison of the optical and electronic properties with those of a hexamericline aroligomer revealed important differences due to delocalization within the highly symmetric cyclic conjugated structure. Exposure of this unique electron-deficient bora-cyclophane to fluoride or cyanide results in amplified fluorescence quenching and can be exploited to switch between an electron-deficient macrocycle and a highlycharged, electron-rich borate cycle.

- Electrochromic conjugated polyheterocycles and derivatives—highlights from the last decade towards realization of long lived aspirations
  Gunbas, G.; Toppare, L. *Chem. Commun.* **2012**, *48*, 1083-1101.
  Abstract:

Electrochromic Conjugated Polyheterocycles

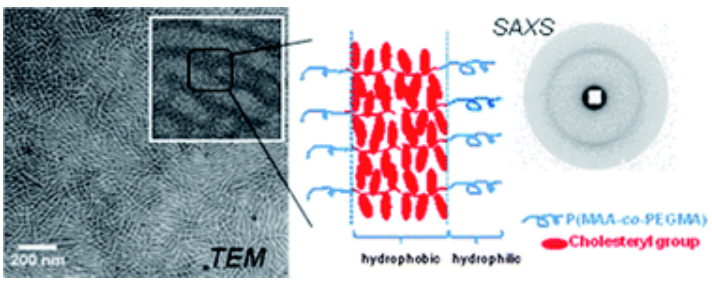
Polymer electrochromism has been considered one of the liveliest branches of conducting polymer research, a tradition continued in the last decade. We have witnessed numerous significant advances, making commercial applications closer than ever. This feature article highlights these advances by separating them into 3 sections. The material design section emphasizes the new molecular structures that have been utilized as electrochromic materials and their promising results. The color control of polymeric electrochromics section focuses on the recent achievements towards realization of full color electrochromic display devices, lastly the advances *en route* commercial applications section demonstrates how some of the major drawbacks towards commercialization have been successfully addressed.

- Micelle-to-vesicle morphological transition *via* light-induced rapid hydrophilic arm detachment from a star polymer
  Du, J.-Z.; Long, H.-Y.; Yuan, Y.-Y.; Song, M.-M.; Chen, L.; Bi, H.; Wang, J.*Chem. Commun.* **2012**, *48*, 1257-1259.
  Abstract:



Micelle-to-vesicle morphological transition has been achieved by light-induced rapid hydrophilic arm detachment from a star polymer. This provides a remote and clean method to control morphology transition of polymeric assemblies.

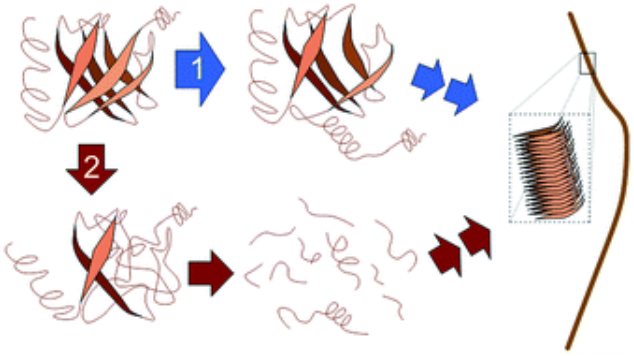
- Amphiphilic liquid-crystal block copolymer nanofibers *via* RAFT-mediated dispersion polymerization
  Zhang, X.; Boissé, S.; Bui, C.; Albouy, P.-A.; Brûlet, A.; Li, M.-H.; Rieger, J.; Charleux, B. *Soft Matter* **2012**, *8*, 1130-1141.
  Abstract:



Well-defined, cholesteryl-based, amphiphilic block copolymer nanofibers have been obtained in a simple, one-pot, ethanol/water dispersion polymerization process using poly((meth)acrylic acid-*co*-

(poly(ethylene glycol) (meth)acrylate) copolymers end-functionalized by a reactive trithiocarbonate end-group as macromolecular reversible addition–fragmentation chain transfer agents (macroRAFT agents). The resulting highly concentrated dispersions were analyzed by TEM (transmission electron microscopy), cryo-TEM, SAXS (small angle X-ray scattering) and SANS (small angle neutron scattering), which allowed the shape and size of the nanoobjects formed *in situ* to be fully characterized and which revealed moreover the presence of a smectic order in the hydrophobic cores. Due to this particular substructure, the nanofiber organization was observed over a broad composition range of the amphiphilic block copolymers.

- Inhibiting, promoting, and preserving stability of functional protein fibrils
  Griffith Jones, O.; Mezzenga, R. *Soft Matter* **2012**, *8*, 876-895.
  Abstract:



Protein fibrils are relevant not only in medicine and amyloid-related neurodegenerative diseases, but also as functional structures in material science or biology. The assembly of protein into fibrils can be promoted or inhibited based on the chosen environmental conditions and interaction with suitable components. We review here the key strategies for promotion and inhibition of protein fibrillation in both physiological and non-physiological conditions in order to create functional designs. The major variables discussed are solvent conditions, metals/ions, biopolymers, aromatic compounds, and surface active components. Due to bias in research directions, deeper investigation has traditionally been carried out for inhibition of fibrillation, but focus has recently shifted. Thus, while various strategies are presented on the breakdown of mature protein fibrils, emphasis is given to the approaches leading to increased rigidity and length of resultant fibrils. We highlight important areas in this field that require further development and promising lines of future experiments.