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Swiss Science Concentrates

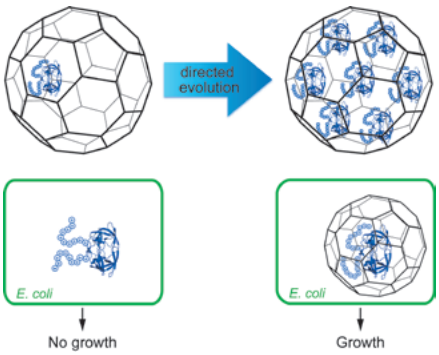
A CHIMIA Column

Short Abstracts of Interesting Recent Publications of Swiss Origin

Directed Evolution of a Protein Container

B. Wörsdörfer, K. J. Woycechowsky, and D. Hilvert*, *Science* **2011**, *331*, 589
ETH Zürich

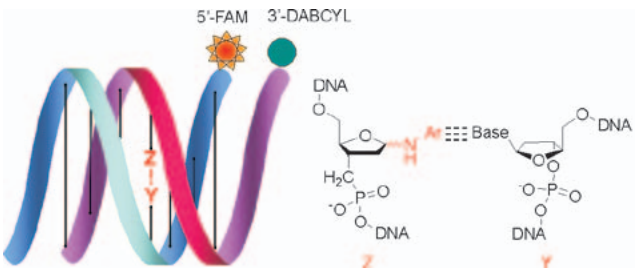
It is widely accepted that compartmentalization is one of the key requirements for the emergence of life. By way of example, encapsulating a toxic protein within a container may offer a competitive advantage to the host. The authors report on the incorporation *via* Coulombic interactions of an HIV protease within a lumazine synthase icosahedral capsid. Four rounds of directed evolution and selection afforded a capsid variant which allowed efficient growth of the host, even at high concentrations of the toxic protease.



A Parallel Screen for the Discovery of Novel DNA Base Pairs

O. Yaren, M. Mosimann, and C. J. Leumann*, *Angew. Chem. Int. Ed.* **2011**, *50*, 1935.
University of Bern

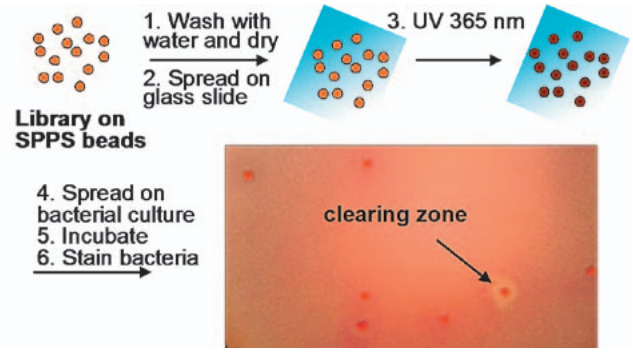
Evaluating aromatic heterocycles towards their suitability as orthogonal nucleobases for base pairing in DNA typically requires multi-step synthesis of each DNA-construct. An ingenious assay is presented which is applicable to high-throughput screening of potential nucleobases. A free nucleobase candidate (a heterocycle bearing an amine) is incorporated *in situ* into a modified DNA double strand. The double strand contains an abasic site opposite a natural base which reacts with the amine to form a hemiaminal. A fluorescence quencher pair, installed at one end of the double helix, serves to assess the relative strength of the resulting base-pairing in a parallel fashion by fluorescence T_m analysis.



Bead Diffusion Assay for Discovering Antimicrobial Cyclic Peptides

V. S. Fluxà, N. Maillard, M. G. P. Page, and J.-L. Reymond*, *Chem. Commun.* **2011**, *47*, 1434
University of Bern

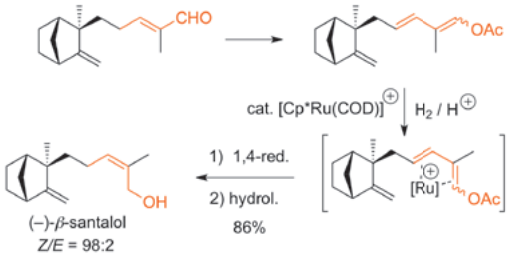
Screening on-bead libraries may lead to false positives. To alleviate this pitfall, the authors report on the generation of a combinatorial library linked to photocleavable TentaGel Macrobeads. This library, consisting of 15,536 cyclic decapeptide analogues of tyrocidine A and gramicidin S, was prepared by solid-phase synthesis. The dry beads were photolyzed and spread on agar plate inoculated with a bacterial lawn. Clear zones formed around beads carrying antimicrobially active peptides. This straightforward method may prove general to explore antimicrobial activities of combinatorial libraries.



The Synthesis of (*Z*)-Trisubstituted Allylic Alcohols by the Selective 1,4-Hydrogenation of Dienol Esters: Improved Synthesis of (–)-β-Santalol

C. Fehr*, I. Magpantay, M. Vuagnoux, and P. Dupau, *Chem. Eur. J.* **2011**, *17*, 1257
Firmenich SA, Geneva

(*E*)-Trisubstituted allylic alcohols, commonly prepared from the corresponding (*E*)-enals, are readily accessible by a simple aldol condensation reaction. In this work, the authors show that these (*E*)-enals can be converted into (*Z*)-trisubstituted allylic acetates (and thus alcohols) by a ruthenium-catalyzed 1,4-hydrogenation of the corresponding dienol acetates. This simple strategy is applied to an industrially feasible synthesis of (–)-β-santalol.



Prepared by N. Bruns, V. Köhler, R. Kramer, P. Mauleón, F. Monnard and T. R. Ward
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