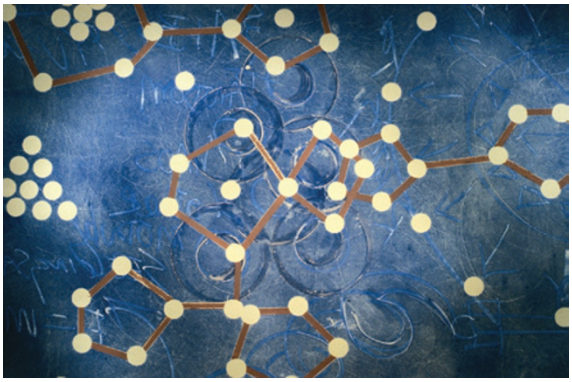
IN BRIEF



CHEMICAL SYNTHESIS

A predictably selective aliphatic C–H oxidation reaction for complex molecule synthesis.

Chen, M. S. & White, M. C. *Science* **318**, 783–787 (2007)

Utilizing unactivated aliphatic (sp^3) C–H bond oxidation in organic synthesis requires catalysts that are highly reactive and predictably selective. Chen and White report an iron-based small-molecule catalyst that uses hydrogen peroxide to oxidize a broad range of substrates. Predictable selectivity was achieved solely on the basis of the electronic and steric properties of the C–H bonds, and enabled the predictable oxidation of complex natural products at specific C–H bonds with useful yields. This type of reactivity stands to enable aliphatic C–H oxidation as a method for streamlining complex molecule synthesis.

AMYLOID DISEASES

Alzheimer's disease peptide epitope vaccine reduces insoluble but not soluble/oligomeric Aβ species in amyloid precursor protein transgenic mice.

Petrushina, I. *et al. J. Neurosci.* **27**, 12721–12731 (2007)

Vaccination of patients with Alzheimer's disease (AD) with fibrillar amyloid-β peptide ($A\beta_{42}$) induced low titres of antibodies and serious adverse events. Petrushina and colleagues describe an epitope vaccine composed of two copies of $A\beta_{1–11}$ fused with a promiscuous non-self T-cell epitope that eliminated autoreactive T-cell responses and induced humoral immune responses in a mouse model of AD. There was a positive correlation between anti-$A\beta_{1–11}$ antibody concentration and a reduction of insoluble cerebral Aβ plaques, which was not associated with adverse events.

BIOTECHNOLOGY

Microscale culture of human liver cells for drug development.

Khetani, S. R. & Bhatia, S. N. *Nature Biotech.* 18 Nov 2007 (doi:10.1038/nbt1361)

To assess the potential liver toxicity of drugs, there is a need for cell-culture models that maintain higher-order cellular processes. Khetani and Bhatia present a miniaturized, multiwell culture system for human liver cells with optimized microscale architecture that maintains phenotypic functions for several weeks. Utility of the model was assessed through gene-expression profiles, phase I/II metabolism, canalicular transport, secretion of liver-specific products and susceptibility to hepatotoxins.

G-PROTEIN-COUPLED RECEPTORS

Probing cell type-specific functions of G_i *in vivo* identifies GPCR regulators of insulin secretion.

Regard J. B. *et al. J. Clin. Invest.* 8 Nov 2007 (doi:10.1172/JCI32994)

To help elucidate the function of the many G-protein-coupled receptors (GPCRs) whose role is not understood, Regard and colleagues developed a pertussis toxin-based genetic method that achieved tissue-specific inhibition of G_i-mediated signalling pathways *in vivo*. Using this model the authors showed that 3-iodothyronamine, a thyroid hormone metabolite, and the protease-activated receptor 2 could regulate insulin secretion and may contribute to physiological regulation of glucose metabolism.

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