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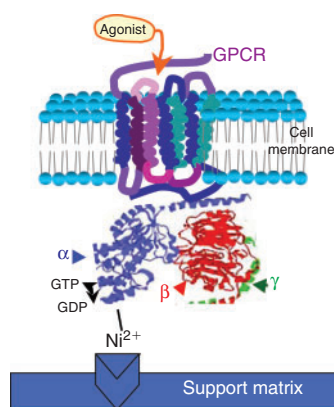
RESEARCH FRONT: Bionanochemistry

Rapid Communication

Molecular Engineering of G Protein-Coupled Receptors and G Proteins for Cell-Free Biosensing

Richard V. Glatz, Wayne R. Leifert,
Tamara H. Cooper, Kelly Bailey,
Chris S. Barton, A. Scott Martin,
Amanda L. Aloia, Olgatina Bucco,
Lakshmi Waniganayake, Gang Wei,
Burkhard Raguse, Lech Wiczorek,
Edward J. McMurchie

Aust. J. Chem. **2007**, *60*, 309–313.



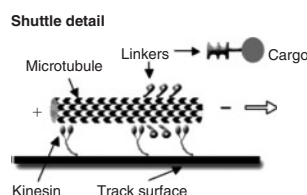
The ability to express and purify modified recombinant proteins so they retain their biological function in a cell-free format has provided a basis for the development of molecular biosensors. The authors here utilize recombinant G protein-coupled receptors (GPCRs) and their G proteins for cell-free detection of various binding partners.

Reviews

Protein Linear Molecular Motor-Powered Nanodevices

David J. G. Bakewell, Dan V. Nicolau

Aust. J. Chem. **2007**, *60*, 314–332.

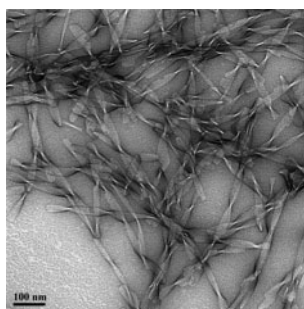


Protein molecular motors are naturally evolved, extremely energy-efficient, nanosized machines responsible for mechanical movement that is essential for many biological functions. In the last decade, research on the use of protein molecular motors in motility assays has lead to many prototypes of hybrid micro/nanodevices. This review describes recent developments in assay motility confinement and unidirectional control.

Amyloid Fibrils: From Disease to Design. New Biomaterial Applications for Self-Assembling Cross- β Fibrils

Sally L. Gras

Aust. J. Chem. **2007**, *60*, 333–342.

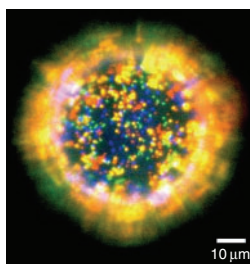


Proteins and peptides can be used to form self-assembling nanofibres that are rich in β -sheet secondary structure and display outstanding properties. This article explores the defining features of these nanofibres, their occurrence in nature, construction in the laboratory, and emerging applications for these nanofibres as novel materials for advancing nanotechnology and bionanotechnology.

Optically Encoded Particles and Their Applications in Multiplexed Biomedical Assays

Bronwyn J. Battersby, Matt Trau

Aust. J. Chem. **2007**, 60, 343–353.



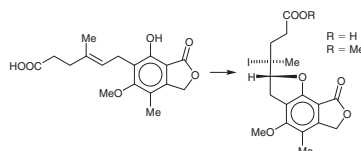
Over the next decade, biomedical researchers will focus on early and personalized diagnosis of diseases such as cancer, and infectious and auto-immune diseases. In order for significant advances to take place in these fields, new technologies are required to ‘read’ quantitative biomolecular information from samples which contain complex mixtures of biological molecules (such as DNA and proteins). In this review, new particle-based technologies for important biomedical applications will be discussed, together with a variety of methods for optically bar-coding particles.

Full Papers

The Stereo Structures of Some Mycophenolic Acid Derivatives

Paul V. Bernhardt, Raymond M. Carman, Tri T. Le

Aust. J. Chem. **2007**, 60, 354–357.



The stereostructures of three iodo compounds derived from mycophenolic acid are available from X-ray crystallography. These structures, which include a tertiary iodide, confirm the stereochemistries previously deduced from mechanistic considerations.

Halogenation of Carbonyl Compounds by an Ionic Liquid, [AcMIm]X, and Ceric Ammonium Nitrate (CAN)

Brindaban C. Ranu, Laksmikanta Adak, Subhash Banerjee

Aust. J. Chem. **2007**, 60, 358–362.

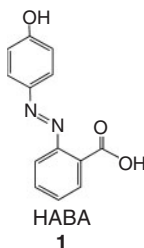


Halogenation of carbonyl compounds is an important process. Here, a novel method for this process using an ionic liquid as reagent is reported. The ionic liquid, acetylmethylimidazolium halide ([AcMIm]X), in combination with CAN promotes halogenations, via a radical pathway, of a wide variety of ketones and 1,3-keto esters at α -positions. This methodology should have further useful applications in green organic synthesis.

Synthesis of a Reversible Streptavidin Binder for Biomimetic Assemblies

Nathan W. Moore, Anthony R. C. Delacruz, Katherine S. Lancaster, Thorsten Dieckmann, Tonya L. Kuhl

Aust. J. Chem. **2007**, 60, 363–368.



The ligand/receptor pair biotin/(strept)avidin are often used in membrane adhesion and biomimetic nanoassembly research. An alternative to biotin is HABA, which binds to streptavidin with a dissociation constant low enough to permit significant rates of dissociation and reversible reassociation, and binds with energies comparable to that for anchoring lipids into bilayers. Further, HABA's optical properties act as a convenient label, with an absorbance peak at 356 nm that shifts to 500 nm after conjugating with streptavidin.

