Activation of the cannabinoid CB1 receptor may involve a W6.48/F3.36 rotamer toggle switch
R. Singh *et al.*
J. Peptide Res., 2002, **60**, 357–370.

Cannabinoid CB1 receptor is a member of the family of G-protein coupled receptors. A similar Rhodopsin (Rho) protein is not constitutive, whereas CB1 is constitutive in action. The differences in the mode of action of two proteins can be traced to a rotamer toggle switch.

Maximum conversion in presence of inert gas
V. Voiculescu *et al.*
J. Indian Chem. Soc., 2003, **80**, 110–119.

The amount of inert gas present in a stoichiometric mixture of gaseous or solid–gas reactions, is important for maximal conversion under isothermal-isobaric or isothermal–isochoric conditions. The authors study two prototype reactions, the first one containing nitrogen in air as an inert component, and the second one containing nitrogen as both inert and reaction product. A survey of 20 oxidation reactions with air, and the corresponding calculations, indicate that conversion is maximum with less than stoichiometric amounts of air for low-to-medium values of the equilibrium constants.

***In vitro* selection of *N*-peptide-binding RNA on a quartz-crystal microbalance to study a sequence-specific interaction between the peptide and loop RNA**
H. Furusawa *et al.*
ChemBioChem., 2003, **4**, 217–224.

RNA-binding proteins are important in cellular regulatory steps at post-trancription, splicing and post-translation, and in the life cycle of RNA viruses. This paper reports a systematic study of sequence-specific binding of RNA to proteins. As opposed to the conventional *in vitro* selection procedures when peptides are immobilized on beads and radioisotope or fluorescent-labelled random RNAs are selected as they pass through a column, a 27-MHz quartz crystal microbalance is used for *in vitro* selection of a box B RNA sequence. This procedure is useful for recognizing and selection of RNA-sequencing binding to a protein without any need for labelling techniques.

Plant-like traits associated with metabolism of *Trypanosoma* parasites
V. Hannaert *et al.*
Proc. Natl. Acad. Sci. USA, 2003, **100**, 1057–1071.

Trypanosomatid parasites cause serious diseases like African sleeping sickness and American Chagas' disease. Trypanosomatids contain enzymes required in glycolytic pathway in compartments called glycosomes. Several of the genes located in the glycosomes appear similar to enzymes found in chloroplast and cytosolic portion in the plant or algal cells. However, glycosomes are absent from other eukaryotes and euglenoids acquire plastids by endosymbiosis.

Surface-enhanced resonance Raman spectroscopy signals from single myoglobin molecules
A. Rita Bizzarri and S. Cannistraro
Appl. Spectrosc., 2002, **56**, 1531–1537.

Raman spectrum of myoglobin adsorbed on silver colloidal nanoparticles at low concentrations has been studied. It has been performed both in solutions and immobilized onto a polymer-coated glass surface. Striking temporal fluctuations in the surface enhanced resonance Raman spectroscopy (SERRS) spectra collected at short times. Development of ultrasensitive spectroscopic techniques led to a perspective of fundamental dynamic processes at the single molecule level. The fluctuations in the Raman spectrum are expected to be detected in single molecule Raman experiments when integration times in the second time scale are taken into account.

Crystal structure of a transcription factor IIIB core interface ternary complex
Z. Sean Juo *et al.*
Nature, 2003, **422**, 534–539.

Transcription factor IIIB (TFIIIB) consists of TBP, TFIIB related factor Brf1 and Bdp1. It is a central component in transcription by RNA polymerase III. A 2.95 Å resolution crystal structure of the ternary complex with 19 bp of U6 promoter DNA is described. The crystals of yeast Brf1–TBP–DNA ternary complex belong to orthorhombic space group $P2_12_12$. The atomic model of the three-dimensional structure is described in the light of data available from extensive surface mutagenesis studies.

A microfluidic system for controlling reaction networks in time
H. Song, J. D. Tice and R. F. Isagilov
Angew. Chem. Int. Ed. Engl., 2003, **42**, 768–772.

A microfluidic system, containing networks of many chemical reactions, is presented that can transform space coordinates into reaction times. This type of network of microfluidic channels is easily fabricated, and is essential for chemical and biological analysis. Both millisecond and minute timescales can be accessed in the same device by altering the channel dimensions and flow parameters. The steady flows can be recorded with a CCD or a photographic camera.

Artificial viruses and their application to gene delivery: Size-controlled gene coating with glycocluster nanoparticles
Y. Aoyama *et al.*
J. Am. Chem. Soc., 2003, **125**, 3455–3457.

Glycocluster nanoparticles (GNPs) containing cytomegaloviral DNA form compactly packed pseudoviral particles, useful for transfection in cultured cells, thereby opening a new vehicle for gene delivery that is serum-compatible and less toxic. These artificial glycoviruses are likely to find use as an alternative in gene therapy.

Genetic control of surface curvature
Utpal Nath *et al.*
Science, 2003, **299**, 1404–1407.

Curvature of biological surfaces is yet to be understood from a molecular genetic point of view. The authors isolate and study *cin* mutant of *Antirrhinum*, a gene that affects leaf curvature during development, introducing a gradual negative curvature. Molecular genetic analysis shows that the gene codes for a TCP protein. It is suggested that the protein works by sensitizing cells to the arrest signal.