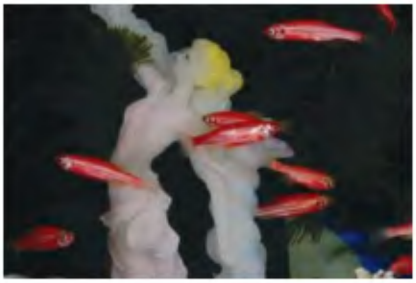
In this issue

Green fluorescent proteins

Discovery of a novel protein, green fluorescent protein (GFP), from the jellyfish, *Aequoria victoria* lead to the identification of a new protein family – GFP-like protein. The phylum of Cnidaria offers the maximum number of fluorescent proteins covering a wide spectrum of colours ranging from blue and green to yellow, pink, orange and red.



The structure of GFP reveals a dimer comprised of two regular barrels with 11 strands on the outside of cylinder. These cylinders have a diameter of about 30 Å and a length of about 40 Å. Small sections of the α-helix also form caps on the end of the cylinders. This motif or folding arrangement, with a single α-helix inside a very uniform cylinder of β-sheet structure, represents a new protein class ($\alpha + \beta$). The protein is comprised of 238 amino acids and has a molecular weight of 26.9 kDa. GFP chromophore is generated in the presence of molecular oxygen by an autocatalytic mechanism initiated by an intrachain ring closure that leads to the formation of a cyclopentyl group from Ser65, Tyr66 and Gly67.

GFP and its mutants soon became popular tools for cell and molecular biology. The development of various sophisticated fluorescent proteins such as photoactivable fluorescent proteins (PA-FPs), Timer, a series of fluorescent sensors and split GFPs has opened up novel applications for *in vivo* fluorescent labelling such as studies of protein expression, interaction activity, movement and turnover, direct measurement of cell parameters and state organelle function and cell motility studies. Study of plant cell biology has benefited tremendously from the use of fluorescent proteins. Development of well-established techniques in genetics, by transient expression or by *Agrobacterium*-mediated plant cell transformation, makes it possible to readily create material for imaging molecules tagged with fluorescent proteins.

In India, several aspects of GFPs have been explored over the recent years. Development of three phase partitioning technique for purification of GFP by Department of Chemistry, IIT, Delhi and improved and simplified screening procedure for monitoring *Leishmania* susceptibility to drugs using flow cytometry by CDRI, Lucknow are a few to mention.

GFP has revolutionized research in medicine and biology. The time is now ripe for increased multidisciplinary collaboration among biochemists, engineers and biotechnologists to tailor proteins and instruments, in tandem, for monitoring applications. See **page 1022**.

Neural representation of an alphasyllabary

One of the most important milestones in the evolution of mankind is invention of writing, which propelled human civilization to grow to the level we see today. Writing is the process by which speech is encoded in a visual form, thereby making language visible and indelible. Reading is the process of phonological recoding of these visible symbols back to speech. However, the neuro-cognitive processes underlying the phenomenon may differ depending on the characteristic features of writing system that need to be decoded. The writing systems used in the world today vary widely on the grain size (spoken form corresponding to written code), transparency (consistency between letter-sound conversion rules) and visual form (structure of the letters). This becomes evident by contrasting English, which has 26 alphabets to represent 44 sounds, with any Indian script with 48–50 aksharas representing as many sounds. Interestingly, the human brain does not have neuroanatomical structures specifically meant for reading. Reading, thus provides, an excellent example of brain plasticity as it is achieved by restructuring already existing neural architecture. The cortical activation underlying representations of different writing systems has been a subject of great interest for researchers to delineate common universal cortical pathways involved in reading no matter what script (orthography) one reads and the script-specific pathways that are unique to reading particular orthography. There has not been a single imaging study on how Indian writing system, considered to be unique on several counts, is processed in the brain. The study by T. Das *et al.* (**page 1033**) is the first ever study that has attempted to capture the orthographic features of Devanagari in terms of functional brain imaging.

Synthesis of silver nanoparticles

Size- and shape-controlled silver nanoparticles and their assemblies find applications in various fields such as plasmonics, disease prevention and control, electronics and catalysis. Commercialization of such applications calls for low-cost production of nanoparticles in bulk quantities that entails continuous flow processing. In this context, rapid, room-temperature and green processes are desirable to minimize capital, design and environmental costs upon scaling-up. Presently, redox reaction based batch protocols have emerged as promising avenues for continuous flow processing. However, typical redox synthesis methods use hazardous chemicals as reducing agents or require significant energy input. So, there is growing interest in the use of environmentally safe 'green' reducing agents. Currently, all the green routes utilize reactions that take several tens of minutes to hours to complete at room temperature, and are thus not ideal candidates for bulk production through continuous flow processing. S. K. Sivaraman *et al.* (**page 1055**) describe a green protocol using tannic acid, a polyphenolic plant extract, as both the reducing and stabilizing agent, and demonstrate its suitability for continuous flow synthesis using a co-axial flow reactor.