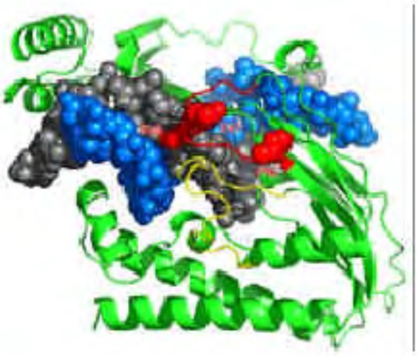
In this issue

Chromosomes to food security

M. S. Swaminathan is widely acclaimed for his innovative use of science to usher in India's 'green revolution', for being the proponent and crusader of the 'ever-green-revolution' and for his role as an ecotechnologist in making science and technology deliver basic human needs through his concepts, now translated into living reality of 'biovillages' and rural knowledge centres. The disconcert, however, is that these magnificent applications of science and technology towards ensuring food security at the household level to millions of rural women and men and linking their sustainable livelihood security with the ecological security of their regions, have rather sadly eclipsed his earlier excellent contributions to basic science – genetics, cytogenetics and mutagenesis of crop plants. During the 1950s and 1960s, the Botany Division of the Indian Agricultural Research Institute (IARI), New Delhi with M. S. Swaminathan emerged as the epicentre of advanced learning and creative research in various facets of cytogenetics, chemical, and radiation mutagenesis, organization of eukaryotic chromosomes and developmental genetics.



Swaminathan had also set up a 'gamma garden' (a gamma irradiation facility) not only for applied mutation breeding, particularly of the vegetatively propagated horticultural crops, but also to assess the effects of protracted chronic exposures on biological systems. In the realm of induction of mutations, besides the goal of obtaining useful mutants in crop plants, the contributions by him and his students on the mechanisms of radiation and chemical mutagenesis, received global recognition.

The Botany Division of the IARI, under the leadership of Swaminathan developed laboratories for genetic studies with *Drosophila melanogaster*, and mammalian cytogenetics. The study of human chromosomes using the peripheral lymphocytes had been published in 1960, but the first laboratory for this kind of work was set up in 1963 in the Botany Division of IARI. To those who asked him curiously about the laboratories of *Drosophila*, mammalian cytogenetics and culture of human peripheral blood in the Botany Division, that too in an agricultural research institute, his disarming, amiable comment was 'How can we really teach genetics without *Drosophila*'! He thereby hinted that two geneticists who contributed to the advancement of our knowledge in genetics through studies in *Drosophila melanogaster* had won the Nobel Prize by 1950, and more would follow.

His work with the late A. T. Ganesan on mitosis in the eukaryotic yeast elucidated the occurrence of cell division *without* the disintegration of the nuclear membrane. Until then, there was even a doubt whether mitosis did occur in yeast at all!

Many today, particularly those below forty-five years of age, might know Swaminathan only as an agricultural scientist, a great intellectual and a policy maker and might even wrongly guess that his Ph D thesis was on a topic related to sustainable food and nutrition security, and/or social and gender equity. While there is nothing wrong at all with such justifiable deductions, we (A. T. Natarajan and P. C. Kesavan), his erstwhile students, would also like to reemphasize his outstanding contributions to basic cytogenetics, mutagenesis, and radiation biology. In fact, some of his former students and associates who have contributed to this special section have indeed carried forward his school of thought to much greater heights for the benefit of humankind. It is as if he has shown us the path, with the belief that we would take his ideas and initiatives forward towards his goals of excellence. Hopefully, that confidence has not been belied.

We are very grateful to all the contributors to the special section (**page 310–367**), to S. Arunachalam and the other members of the Editorial Board of *Current Science*. M. S. Swaminathan's 80th birthday falls on 7 August 2005. The special section is in his honour.

A. T. Natarajan
P. C. Kesavan

Trace metal geochemistry of rivers

Rivers from the southeast Asia play a significant role in delivering and controlling sediment distribution patterns. There is a major amount of sediment being delivered from the southeast Asia Rivers to the oceans. The major Indian rivers including Brahmaputra, Ganges, Narmada, Tapti, Godavari, Krishna and Cauvery along with Chinese riverine and estuarine systems of Yalujiang, Shuangtaizihe, Luanhe, Huanghe, Jiaojiang, Zhujiang, Daliaohe and Changiang in both the regions reflect changes in water discharge and sediment yield, with significant variation of rainfall and vegetation coverage in the drainage areas. Alagarsamy and Zhang (**page 299**) describe the trace metal geochemistry in Indian and Chinese rivers to understand its variation on a global scale in terms of climate, geological conditions and anthropogenic impact based on the particulate/bed sediments studies in Indian and Chinese river/estuary systems. The chemical composition of elements in sediments, suspended particulate matter (SPM) and soil on a world basis and the riverine composition of metals in SPM of India, China and world rivers are compared to understand the regional climatic shift from temperate to sub-tropical conditions.