In this issue

Young Indian Researchers
Career challenges

It was more than a decade ago that India first spelt out a vision of being a world leader in scientific research. There is a possibility that this vision can be converted into reality, just as the young people of the '90s transformed India from a developing country into an emerging economy'.

Yet it appears that the vision may remain a hope, a dream, a desire. The results of a survey conducted by the Indian National Young Academy of Sciences show that there are too many challenges that the young Indians of today have to surmount to conduct meaningful research.

From finding jobs, to acquiring funding, getting space for official and experimental work, hiring and mentoring research scholars and post docs, to getting empowered to manage and administer to the needs of the team while juggling with increasing family size and responsibilities, all the odds seem to be stacked against young Indians in their journey to become independent researchers.

What can and needs to be done?

Read the General Article on **page 135** in this issue for suggestions on fixing the problem.

Women Scientists
Life trajectories

Today, there are more women than men in STEM post graduate courses. But when it comes to PhD, the situation reverses and there are more men. And when it comes to a career in science, the disparity becomes more prominent. Higher up in the hierarchy of sociology of science, the situation becomes stark.

What are the factors that influence career choices among women in STEM? And having chosen a career in science, how do they balance life and work? What are the factors which help them and what are the hindrances? What are the professional experiences of women scientists that are distinctly different from those of men?

A General article by Anitha Kurup and Anjali Raj explores some of the reasons behind the highly skewed sex ratios in Indian science. Turn to **page 144** in this issue.

Dynamic 3D Cell Culture
From cells to organs

It is now nearly a century since the technique of growing a monolayer of cells on culture media was first developed. The 2D *in vitro* cultures were used to evaluate the toxicity and beneficial effects of drugs and for many other scientific investigations. And then, nearly four decades ago, techniques to grow 3D cell cultures started evolving. Since 3D cultures are closer to the static *in vivo* physiological conditions, the techniques were actively explored by many labs. And then, a decade ago, techniques to simulate the dynamic conditions of *in vivo* physiology started developing.

A Review Article in this issue explores the various techniques, their uses in research and medical applications as well as the advantages and limitations.

It appears that factories for making organs, from stem cells taken from patients, to replace faulty ones, are almost on the horizon.

For an exciting read, to enter this potential path to the future, turn to **page 149**.

Capuchin Monkeys
Tale of semi-prehensile tails

Some new world species of monkeys evolved prehensile tails, which can grasp branches and support their weight when hanging upside down, leaving their forelimbs free – an extremely useful organ for arboreal monkeys during locomotion and foraging for food.

But some other species developed less sturdy, semi-prehensile tails. Their tails can grasp branches, but do not support their full weight. It allows them only to balance without falling down while leaning further down to grasp food with their forelimbs.

The two types of tails differ substantially, points out a Research Article in this issue, after a study of the use of the semi-prehensile tail of capuchin monkeys.

The researchers used the end of a pole to offer palm nuts, a favourite food, to seven bearded capuchin monkeys living in an open woodland area in Brazil. The monkeys have to come to a bifurcating branch, stand on the lower branch, grab the upper branch with their tale and lean forward and a little down to grab the food with their forelimbs. The researchers recorded the process with a high speed camera to analyse the biomechanics.

The capuchin monkeys would come to the lower branch using all four limbs, wrap their tail around the upper branch while shifting their weight to hind limbs, extend one forelimb while increasing the tail flexion around the upper branch, and then extend the other forelimb outward while sliding the contact point of the tail to the tip and tightening it around the branch, bend the knees a bit before reaching for the food about one metre away and slightly lower than the branch that they are standing on. At this point the tail acts like a cantilever, they found.

The mechanics of this tripodal arrangement of the hind limbs and tail resembles the cantilever arrangement for extending electric lines down from poles to electric trains, point out the researchers.

For more amusing details, turn to **page 195**.

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