

## Trickle down research: Do we need to turn from top-down to bottom-up?

One can never be certain as to when the whole thing exactly began. Or whether the precise spark was from a 'News and Nature, or something else.

Or if the seeds of the decision to fund heavily on 'genomics' and 'proteomics' were actually sown in the airport waiting lounges. But one can be certain of this, that, overnight, classical microbiologists sprout into genomicists, biochemists purifying proteins turn into proteomicists, and even a spattering of knowledge of 'MS Word' and 'BLAST' embolden a few to stake claims on bioinformatics. Both funders and funded close their eyes to the scam.

As we once again stare blankly at the Olympics medal tally, we perhaps need also to introspect on matters closer to our hearts. And as we confront ourselves with the fact that a developing country like Brazil, with far less scientific manpower than we boast of, succeeded in sequencing the genome of the first plant pathogenic bacteria (*Xylella fastidiosa*) some years ago, and that China accomplished the genome

of rice in under four years, we simply cannot afford to fool ourselves any longer. We may want to dismiss these achievements as being largely technical and organizational in nature, but that is not entirely true. And it would be unfair, and more importantly, unwise, to dismiss these achievements in such a casual manner. Some measure of introspection is called for. For example, is our 'lack of delivery' the consequence of a bias towards a top-down approach? Wherein, starting from the simple decisions of 'celebrating science day' to more complex issues like participating in programmes in drug discovery, genomics, biodiversity or nanotechnology, and changing the directions of research interests are direct consequences of a dictat from above. Most often they only give rise to FGCs (fund grabbing converts), because such transformations into new research areas cannot occur meaningfully, overnight, unless one is already infused with a good measure of exposure, or thought, in these areas. Or is it our unwillingness

(or sheer indifference?), as participants of large interlab projects, to recognize that 'the chain is as strong as its weakest link', simply because the projects have been generated top-down and lack that extra commitment? And if that is not the only problem, is it the scientists' lack of sufficient and continuous exposure to modern areas, or simply a consequence of a general lack of rigour at the bench level? Hopefully someone somewhere has answers to these questions or solutions to these problems. But one increasingly gets the uncanny feeling that we tend to rely a little too heavily on a 'trickle-down research' approach that is in danger of trickling into nowhere. Is it time we turn from top-down to bottom-up? But, for that, we need a good, strong bottom.

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## Yumthang: less-known valley of flowers in Sikkim Himalaya

While on a trip to Sikkim Himalaya for the collection of *Pedicularis* species, on the way to Shivamandir from Gangtok by road, we came across a beautiful valley full of flowers, only 8 km before Shivamandir and ca 140 km away from Gangtok, the capital of Sikkim. The flowers covered the ground like a colourful carpet (Figure 1). This 'valley of flowers' situated in Yumthang is not well known to the people of the country and also to the outside world. The well-known



**Figure 1.** View of Yumthang – valley of flowers.

valley of flowers in Garhwal Himalaya, Uttaranchal attracts tourists from all over the world, thereby generating a lot of revenue for the country as well as for the State.

The valley of flowers in Sikkim lies at an altitude of 3500 m asl, which is ideal for the growth of herbaceous flora. On one side of this beautiful valley is the Teesta river and on the other side there is a road. While travelling on this road, the valley extends to about half a kilometre and runs along the road.

Some of the herbs found in this valley are *Pedicularis siphonantha* Don (Scrophulariaceae), *Potentilla kleimiana* W. & A. (Rosaceae), *Artemisia indica* Willd., *Anaphalis hookerii* C. Bel., *Aster pseudomellus* Hook., *Senecio chrysanthemoides* DC., *Lactuca dissecta* D. Don (Compositae), *Ajuga bracteosa* Wall. ex Benth. (Labiatae), *Swertia bimaculata* Hook.f. & Th (Gentianaceae), *Poa sterilis* Bieb (Poaceae), etc. The view of flowers in this valley is fascinating. This valley can be developed into a tourist place as it is approachable

by road, unlike the valley of flowers in Garhwal Himalaya, where one has to trek for about a day.

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