In this issue

Seamounts

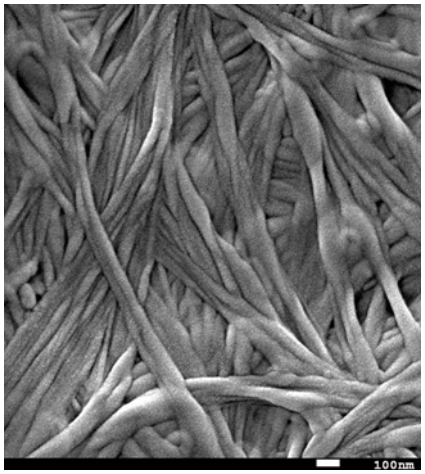
The questions of the birth of a seamount through volcanism and its subsequent death at a subduction zone are of great significance. Till a few decades ago seamounts were regarded as a hazard that were required to be plotted on bathymetric charts to help in navigation. Seamounts being natural laboratories, serious investigations were taken up once their true potential to help unravel the working of the dynamic Earth and her oceans. Their study opens up avenues to decipher the processes such as: geological (plate movements, subduction, and seismic, volcanic and hydrothermal activities), physical (formation of eddies, current circulation), chemical (transport and exchange of solute fluxes, geochemical cycling of elements), biological (biodiversity, endemism, production and distribution of species), and for commercial purpose (favourable site for fishing, exploration and exploitation of metals, marine observatories). The two major constraints in exploring seamounts are (1) their distribution (in thousands) over a large area (million sq. km) of the oceans which makes it difficult to rapidly assess the seamounts with the existing technology and logistics, and (2) several of the aforementioned themes have been examined by researchers in isolation. Some of these concerns have been addressed by the international community by conducting multidisciplinary collaborative studies and the results have thrown up surprises in the working of the dynamic Earth. Although a few Indian researchers have reported on the seamounts existing at diverse locations, unfortunately India is yet to initiate a concerted effort to study the seamounts in their totality. A national programme to evaluate the seamounts in India's Exclusive Economic Zone could be a good starting point. **See page 1382**.

Evidence-based Ayurveda

Ayurveda is not just herbal medicine but a science of life with a holistic approach to health and personalized medicine. Epistemological differences between Ayurveda and biomedicine should be taken into account when designing evidence-based research protocols. Ayurveda is basically pragmatic, systemic and holistic, whereas biomedical sciences are theory-based, structural and reductionist. The classical approach of Ayurveda should not be compromised for convenience of existing scientific research methods. Appropriate research methodology and research protocols should be carefully designed, involving experts from Ayurveda and biomedicine. Patwardhan (**page 1406**) provides an account of a basic scientist, which has resulted in many innovative concepts and projects such as Ayurvedic Pharmacoepidemiology, Reverse pharmacology, Ayusoft, Ayugenomics, Rasayana, Systems Ayurveda Integrative medicine. The knowledge base of Ayurveda, ranging from medicinal plants to personalized therapeutics and scientific advances in biomedicine together can help in improving our understanding of health and disease processes. Basic concepts of Ayurveda such as Prakriti, Agni, Dhatus, Srotas, Rasayana and Shatkriyakal, may provide new leads for biomedical research. Such integrative approaches will facilitate the present quest for evidence-based Ayurveda for affordable and safe healthcare.

Bacterial cellulose and nanoparticles-embedded composites

Cellulose at the molecular scale is a linear polymer of sugar molecules and is synthesized both by plants and bacteria. These linear polymer chains organize into fibres at the macroscopic scale which are then packed into a random three dimensional network-like structure. The fibrous nature of this structure provides mechanical strength because of which plant produced cellulose has been used historically for structural applications. The plant produced cellulose however contains hemicelluloses and lignin along with cellulose because of which its strength is lower compared to the inherent strength of pure cellulose-based structure. Bacterial cellulose on the other hand is pure



except for possible polymorphic forms mixing and hence has much higher strength compared to plant produced cellulose. Another significant attribute of cellulose in general is its sustainability and biodegradability. Both production and degradation do not put additional load on the natural materials cycle and are carbon neutral (negative). The strength coupled with its sustainability and biodegradability, has attracted considerable attention recently to functionalize cellulose and utilize this functionalized cellulose in a wide variety of applications ranging from medicine to electronics. The relatively new functional applications of bacterial cellulose and nanoparticles-embedded composites are reviewed in the article on **page 1398**.