**In this issue**

Intensive studies based on animal models to definitively establish which genes and tissues have a causal role in the development of MetS are largely absent, however.

A Research Communication, page 1157, addresses this lacuna in knowledge by using the male Wistar rat as an animal model to probe into the nuances of MetS escalation. In this study, researchers attempt to induce MetS in the rats by feeding them a specially formulated high-fat-simple-carbohydrate diet for five months.

So, do the rats become obese? Is MetS induced? Is the glucose tolerance of the rat impaired? Does the diet lead to...CHaos?

Let us just say that one would be none the wiser if one continued to indulge in anything too sweet and too fatty.

**Breaking DNA backbone**

ANCHOR one end of a rope ladder, and twist it from the other end. Twist it again. And again. Twist it as many times as necessary to get exactly four rungs between each helix. From afar, what does this structure look like? The twists, the two helices of the side rope, the tiny knots in the side rope stacked one atop the other from one end to the other.

Epiphany. Why it reminds one of the B-DNA double helix of course! The B-DNA double helix comprises two anti-parallel strands which are bonded together by nitrogenous base pairs. Each strand comprises (like the knots in the side-rope) sugar–phosphate groups stacked one atop the other. Given such a precarious structure of DNA, composed of so many different molecules twisted and turned, how is its structural integrity maintained? What stabilizes the DNA structure?

Three molecular interactions stabilize the structure. First, hydrogen bonds—the rungs of the ladder—between the basic pairs of the strands ensure that the strands are joined: Two bonds between AT; three, between GC. Second, stacking interactions between the sugar–phosphate groups, which make the backbone of each strand, ‘weld’ the sugar–phosphate groups to one another. And third, covalent bonds link the AT/GC base pairs to the sugar–phosphate units, thus reinforcing the structure further.

Several studies have computed the strength of these molecular interactions and have established that the contribution of the stacking interaction of the sugar–phosphate to the overall stability of DNA is comparable to that of the hydrogen bonds. However, there have been only a handful of studies that have gone a step further and tried to find out as to how stable the DNA would be without the sugar–phosphate group. In other words, given that the sugar–phosphate groups most assuredly constrain the geometry, and hence the stability of the DNA, how crippling an impediment are they? And if indeed they constrain DNA geometry significantly, what are the differences in DNA stability with the sugar–phosphate backbone, and without it?

A Research Communication, page 1126, computationally ‘breaks’ the DNA backbone, and endeavours to answer each of these questions.

**Seeding solar fertile roofs**

THE dense and crowded rooftops of Indian cities are ‘solar fertile.’ Solar panels can be mounted atop the roofs of medium and high rise buildings, and connected to one another, thus creating an extensive solar grid to meet the anthropogenic demands for electricity. Indeed, a General Article, page 1080, reveals that solar panel grids installed atop medium and high rise building clusters generate enough electricity not only for the building dwellers, but also a significant surplus.

This technology, known as the roof-top photovoltaic module (RTPV), has been around for many years and is being used extensively world over. The European Photovoltaic Industry Association, for instance, estimates that 40% of the EU’s demand would be met by RTPV by 2020.

Given such positives of RTPV, the question begs to be asked: India, being a tropical country, is endowed with a preponderance of solar radiation, then why isn’t RTPV being adopted on a large scale? Yet, installation of an RTPV costs upwards a lakh, but annual savings works out to be around ten thousand rupees. Further, in some states, Tamil Nadu and Gujarat for example, there are government schemes which subsidize the RTPV costs and also pay the owner for producing electricity; yet why aren’t our roofs crackling with electricity? Isn’t it high time we seeded them with RTPV?

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1026 CURRENT SCIENCE, VOL. 108, NO. 6, 25 MARCH 2015