

### Grow with red

» Inspired by cyanobacteria that can synthesise chlorophyll f by taking energy from the far red end of the light spectrum, a *Science* report suggests incorporating the protein responsible for chlorophyll f synthesis into crop plants.



### Warming up helps

» A study carried out by behavioural ecologists on songbirds known as Adelaide's warblers (*Setophaga adelaidae*) concluded that practice did improve the quality of birdsong. They observed that these birds practised their songs before dawn to warm up.

## NASA plans to send submarine to Titan

Saturn's moon Titan is unique in the outer solar system in that it is the only one of the bodies outside the Earth known to contain liquid lakes and seas on its surface and NASA has unveiled plans to send a submarine into the depths of its largest ocean - Kraken Mare.

NASA is working on sending a submarine into the depths of the Kraken Mare, news agencies reported on Saturday.

The Titanian seas, however, are not composed of water, like Earth's seas, but are seas of liquid hydrocarbons and one of the reasons why NASA wants to go to Titan is "to determine if hydrocarbon based life is possible on Titan," NASA cryogenics engineer Jason Hartwig said in a presentation at the NASA Innovative Advanced Concepts Symposium held this week in Raleigh, North

Carolina. Secondly, with clouds and an atmosphere, Titan is very similar to Earth, apart from the extreme cold and oceans of liquid methane.

But hidden in the methane sea may be clues to how life evolved and potentially some weird extra-terrestrial microbes, the report said. The proposed submarine would carry instruments to measure the chemical composition of the ocean, the currents and tides, and the structure of the ocean floor.

NASA has a proposed launch date of 2038 because of how the Earth and Saturn are aligned with Titan's seasons.

Sprawling over some 1,000 km, with depths estimated at 300 m, Kraken Mare represents an opportunity for an unprecedented planetary exploration mission, NASA earlier said in a statement.

IAN S

## Obesity is linked to at least 8 more types of cancer

A review of more than a thousand studies has found solid evidence that being overweight or obese increases the risk for at least 13 types of cancer. The study was conducted by a working group of the International Agency for Research on Cancer, part of the World Health Organization.

Strong evidence was already available to link five cancers to being overweight or obese: adenocarcinoma of the esophagus; colorectal cancer; breast cancer in postmenopausal women; and uterine and kidney cancers.

This new review, published in *The New England Journal of Medicine*, links an additional eight cancers to excess fat: gastric cardia, a cancer of the part of the stomach closest to the esophagus; liver cancer; gallbladder cancer; pancreatic cancer; thyroid

cancer; ovarian cancer; meningioma, a usually benign type of brain cancer; and multiple myeloma, a blood cancer.

According to the chairman of the working group, Dr. Graham Colditz, a professor of medicine and surgery at Washington University in St. Louis, these 13 cancers together account for 42 per cent of all new cancer diagnoses.

"Only smoking comes close" as an environmental factor affecting cancer risk, Colditz said. "And that's an important message for non-smokers. Obesity now goes to the top of the list of things to focus on."

Obesity is associated with significant metabolic and hormone abnormalities, and with chronic inflammation, factors that may help explain its link to cancer.

Elizabeth A. Platz, a professor of epidemiology at the Johns Hopkins Bloomberg

School of Public Health and a widely published cancer researcher who was not involved in the report, said that this was a "high-caliber working group of respected epidemiologists and laboratory researchers," and that women in particular should take note of the results. "The strongest association they found," she said, "is with uterine cancer. And postmenopausal breast cancer is also connected to obesity, especially estrogen receptor positive cancer. These are important messages that women need to hear." Most of the studies the researchers looked at were observational so they cannot prove cause and effect, though researchers considered evidence sufficient if an association could not be explained by chance, bias or other confounding factors. And most compared any increases in risk to that of an

adult of normal weight having a body mass index of 18.5 to 24.9. For some cancers, the group found that the fatter the person, the greater the risk. In endometrial cancer, for example, compared with a woman of normal weight, one with a BMI of 25 to 29.9 was at a 50 per cent higher relative risk. But her risk more than doubled at BMIs between 30 and 34.9 and more than quadrupled at BMIs of 35 to 39.9. A woman with a BMI of 40 or more was at seven times the risk for endometrial cancer as a woman of normal weight.

The group found only limited evidence that obesity could be linked to three additional types of cancer: male breast cancer; prostate cancer; and diffuse large B-cell lymphoma, the most common form of non-Hodgkin's lymphoma.

The New York Times News Service

The New Indian Express  
HINDU, MONDAY,  
AUGUST 09, 2016,  
Education plus, P. 2

# Can we aim for 50 medals in the 2028 Olympics?

### » SPEAKING OF SCIENCE

Well, the 2016 Olympics are over, and a lot of debate has taken place on why, with about 130 crore people, we are not able to field enough athletes of Olympics class. The belief is that there are people in India who can, given the necessary enabling environment and encouragement, win a hundred medals in the Olympics. Comparisons are made about how China turned around during the last few decades, from a poor record into one that won 70 medals, or America, with a population just one-third of ours, bagged 121 of them.

To me, this debate is curiously similar to the one we hear about the state of science, technology, engineering, agriculture and medicine, (STEAM for short). Given the huge population,

should we not have had several Nobel winners, leaders of thought and movers of the world? Indeed, such soul-searching has been happening in India for almost a century. Indeed, policy planners since Independence have been seized of this question, and put together plans of action that have attempted to improve that state of affairs in STEAM across the country. Things have improved somewhat, but we have a long way to go, we do not have Nobelists (yet) - but at least we are trying out various ideas. In addition, in the areas of STEAM, we have worked on "Mission Modes" for the needs of the country - be it on Atomic Energy, Defence, Space, Green and "Ever-green" Revolution, drugs and vaccines, eradication of several diseases and so forth, with notable success. In the case of athletics and Olympic golds, our national mission is to provide everything that helps to identify "hidden talent" and help them on to the world stage.



The debate on medals is curiously similar to that about science, technology, engineering, agriculture and medicine. PHOTO: PTI

It is here that some of the methods that have been tried and used in promoting STEAM might be of value. The Planning Commission and the Scientific Advisory Councils, have helped in putting together new institutions, granting mechanisms and projects of value. A

similar Sports Advisory Council to the Prime Minister, comprising a handful of non-political people of proven stature and commitment might help. Such a council would advise plans of action for the long term (not just for the 2020 Olympics, but way beyond), which can

be executed through the relevant ministries or better by the Prime Minister's office itself. (Indeed, why do we need a separate Ministry for Sports at all? Should the Ministry for Human Resource Development not suffice? We need to cut the bane of bureaucracy mercilessly).

Two very useful talent hunting schemes which have worked well over the years are the National Science Talent Scheme and the Kishore Vaigyanik Protsahan Yojana which allow high school and college students to spend time in research laboratories for short periods of time, and pursue higher degrees in STEAM. Hundreds of such "science talent scholars" have done well in their careers and several of them shine in their professions. All that the government did was "match making" between the youngster and the host lab and paid the youngster some living cost. The science academics of India have improved in this "match making" and turned many a "summer research scholar" into full-fledged scientists. And the INSPIRE program of the Department of Science and Technology of India has helped literally thousands of school and college students engage in science.

Taking the cue from these, putting together a Sports Tal-

ent Search Scheme on a large scale would enable youngsters spend time to discover and hone their talents in sports. It will also help them spend time with stars such as Sakshi Malik, PV Sindhu, Saina Nehwal, Sania Mirza, Dipa Karmakar, and also teachers such as P. Gopichand, U. Vimal Kumar, Ishwar Singh Dahia, Kuldeep Malik, Jagdish Singh, Bishweshwar Nandi, J. C. Dhillon and others.

Another method used by the science agencies in India is to bring world leaders to come and spend time in labs and universities in India. This allows our youngsters to interact with these famous names, thus helping to boost self-confidence and motivation. Likewise, why not invite Usain Bolt, Michael Phelps, Nadia Comaneci, Mare Dibaba and the entire Ethiopian Marathon team to visit India on a regular basis? Our youngsters will learn a lot from them.

Additionally, funding may be provided to chosen young-

sters to go spend time with such experts and learn for them. In order to do this, it would be useful to hold periodic "Olympiad" competitions across India to identify and bring out hidden talents and nurture them.

India is home to a whole host of physiologically diverse populations; some may be more suited for gymnastics, some for running, some for swimming and some for other sports and games (see p. 21, Down To Earth, August 16-31, 2016 and Shekar Swamy, The Hindu, August 26, 2016). We need to explore this diversity and suit it to the needs of specific sports and athletics.

All these efforts will bear fruit not in 2020 but on a longer term. It takes time, but with effort and commitment, we should aim for at least 50 medals by 2028. A pipe dream? Recall that Mangalyan would not have been possible 50 years ago, when ISRO was born.

D. Balasubramanian  
dbala@lvypei.org