



Researching the
building blocks **of life**

Angsuman Sarkar has obtained his PhD degree from Department of Biotechnology University of Pune in 2004. He went for a post doctoral training in Cold Spring Harbor Laboratory, New York, USA for three years. After finishing there he joined Department of Molecular Biology and Microbiology in Case Western Reserve University in Cleveland, USA as a senior research fellow. Later on he was offered Associateship in the Cancer Biology Department in Cleveland Clinic Foundation, Cleveland, USA. Besides teaching the core courses at the UG and PG level, Sarkar has been involved in teaching advance courses like Animal Cell Technology and Cancer Biology.

Excerpts of an Interview:

Q: You are recently nominated as Fellow of Indian Academy of Cell Biology and executive committee member for Indian Society of Cell Biology for the year 2016-2019. What will be your duties and challenges related to this field of Cell Biology?

Well, this is a great opportunity and I am proud to be nominated in 'All India Cell Biology Executive Body' from BITS Pilani Goa Campus for 2016-2019. I am supposed to be involved in making 'cell biology' a more popular subject among the younger generation. The need of the hour is to bring back the larger pool of good students towards the basic science including biology. We also need to organise few popular talks on 'Cell Biology' across the country including Goa. I am interested in organising one conference in BITS Goa on 'Cell Biology', where I am planning to

invite most of the colleges in and around Goa as well as Goa University. In that conference we should not only focus on research related to cell biology but there also should be a special session where we will discuss how to make cell biology more interesting to the recent generation. As a body we are planning to hold a tripartite meeting of ISCB, APOCB and IFCB in Hyderabad Centre for Cellular and Molecular Biology in January 2018. This will be the first-ever joint meeting of these two International cell biology organisations, and will see cell biologists from across the world coming together to showcase and discuss their work. Sessions on cell biology education, what a career in cell biology means, scientific writing and ethics are also planned. Latest tools available to cell biologists will also be discussed and showcased.

Q: You are involved in setting up the stem cell bank in Goa. Why do you think there's a need to set up this bank? Is it to promote health tourism or is it due to rise in cases of cancer in Goa? Please elaborate.

Yes, I have been working on this project with another medical person in Goa. 'Stem cells' are the foundation of our body. Every organ in our body having its own 'stem cell bank', so during a small injury it can take care of itself on its own. A stem cell has the potential to copy itself throughout its life time. Nowadays among the most advanced clinical trials are those that aim to treat certain types of blood cancers (leukemia), bone (arthritis), skin (burn injury), corneal diseases, with a graft of tissue grown from stem cells taken from these organs.

Particularly in Goa no such stem cell bank exists. Nowadays' parents may want to save

their children's cord blood stem cells for the future requirement but unfortunately in Goa you do not have such facilities. This is problem I faced when I wanted to do it for my son. So you have to depend on some person to send it either to Bengaluru or somewhere else. That means it has to travel out of Goa to another state! Now the question is, when 'Goa has everything' why not a stem cell bank? So I have started working on this with one of the very well-known medical persons in Goa. In future, we want to give Goa its first stem cell bank as well as a modern research center on 'stem cell banking'. As a popular international tourist destination it is also a fantastic idea to deliver this service to other people with much less money. I am sure in near future we will be able to build up this 'dream' in Goa.

Yes, I also do research on cancer biology and now one of the major concerns in Goa is the rise in the cancer patients. Certain type of blood disorders including blood cancer can be treated with the stem cells. But we need to provide an opportunity in Goa so that these patients need not to travel to Mumbai or Bengaluru or somewhere else for such costly treatment.

Q: For a common man the term 'stem cell' sounds complicated. How would you explain this to a lay person and why we need a stem cell bank? Also what's the procedure to follow or in other words how one should contribute to this bank?

A stem cell is a cell in the body that can divide and has the potential to become any specific type of the cells. When an organism grows, stem cells specialise, and take on specific work. For examples, mature tissues like skin, muscle, blood, nerves, all have number

Angsuman Sarkar of the Department of Biological Sciences, **BITS Pilani K K Birla Goa Campus**, has been recently nominated as Fellow of Indian Academy of Cell Biology (FIACB) and executive committee member for Indian Society of Cell Biology for the year 2016-19. He is also involved in setting up a stem cell bank in Goa. In conversation with **NT BUZZ** he speaks about the stem cell treatment and how it can help to heal humanity

of different types of cells. Because stem cells are not yet differentiated, they have the potential to become some kind of specialised cells. Organisms also use stem cells to replenish their damaged cells. During neuronal injury, suffering with arthritis, certain types of blood cancers, certain types of corneal disorders nowadays the most modern treatment is with the 'stem cells'. I am sure people have heard about 'bone marrow transplantation' during leukemia, it is nothing but a stem cell therapy. You will be glad to know in USA in few places they are even treating the myocardial infarct (heart attack) patient where the ejection fraction is well below 20 with the stem cells.

Stem cell therapy, also known as regenerative medicine, promotes the reparative response of diseased, dysfunctional or injured tissue using stem cells or their derivatives. It is the next chapter of organ transplantation and uses cells instead of donor organs, which are limited in supply. For a country like India with such a huge population this kind of therapy may be the best possible way to treat a large number of patients in future.

Therefore, in a stem cell bank such undifferentiated cells are preserved

at a subzero temperature after certain type of processing. Practically speaking any person could donate or contribute their stem cells in such bank. Right now though the most prevalent and popular way to store stem cells from a person's umbilical cord blood during the birth but at the same time there are places where it could be collected from the tooth pulp as well.

Q: Apart from umbilical cord and menstrual blood which are the other sources of stem cell?

In autologous bone marrow transplantation, bone marrow is extracted from bone and given back to the same person to replenish the hematopoietic stem cells, for example in case of leukemia patients.

Adipose tissue (fat muscle) is another rich source of adult stem cells. These multi-potent stem cells can differentiate into many cell types, such as fat, muscle and bone cells, as well as cartilage and nerve.

Human skin, tooth and placental tissue are also the source of stem cells.

Q: The stem cell therapy is marred with ethical and religious controversies. How far you agree or disagree with these issues?

Definitely this is a very genuine and tough question to be answered. I personally feel if a 'therapy' can protect or save a human life, I will go ahead with that but at the same time I must obey the law of the land. Without disheartening somebody's religious sentiment if I can make him or her understand the positive side of the stem cell therapy that is the big plus. I feel that media has and should play a major role in helping this.

Q: Mainly stem cell treatment is associated with diseases like thalassemia, leukemia. Is it capable of treating more diseases?

Yes, in fact stem cell therapy has a vast and huge potential. Diseases like cardio vascular, Parkinson, arthritis, burn injury, liver and kidney disease, diabetes, muscular dystrophy, erectile dysfunction as well as spinal cord injury are possible to tackle with stem cell medicine and regenerative therapy.

Q: Do you believe the stem cell will bring in radical change in medical science and healing humanity?

Yes, I am a person who likes to dream. I always feel that the future medicine will be depending a lot on stem cell and regenerative medicine. This will bring a radical change in the way we are now managing the diseases. In fact in BITS Pilani K K Birla Goa campus we teach such courses for our higher degree students.