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Ã¢â?¬Å?Regenerative medicine must be introduced as an organized disciplineÃ¢â?¬?

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Q: Please explain the relevance of regenerative medicine in present context and how significant it is as an alternative to existing form of medicines?

Dr Sen: Regenerative medicine is the natural future progression of medicine. There was a day when transplantation was not possible and then we came to the era where we could take organs from a dead body or from a life donor and provide it to a recipient. But the biggest issue related to transplantation is human rejection and human compatibility of the organs. Now we are moving into the next era where you don't just transfer the body of the adults. Tissue engineering, organ engineering is what you have and that generates organ or tissue. But this is gradually coming up to be huge because anything that is a success in medicine helps to establish a big business. From a healthcare as well as economic point of view, if you are not positioning for this, then you would be playing catch up later on and people will get care. So the goal here is to form the discipline and today you saw the national facility. So that's already a big acknowledgement and then gradually starting diabetic programs, curriculums so that the next generations are trained as expert. So this is not really an alternative, but a natural progression, the future of regenerative medicine.

Q: Do you think regenerative medicine has really taken off in India? When could we expect to see the real results (translation into products) on ground?

Taken off means these are the seeds of what AIIMS is currently doing and starting to formulate. So yes, there is a very strong interest and I think that within the next three years there should be some programs that are in place, that are actually training people and generating new science and within the next five years I anticipate that there would be an impact on patient care and this can happen parallely. There are certain parts of science that are ready to be taken to people. I have noticed that in India there are numerous entities on their own in their way that can be significant if involved.

Q: What is the role that you see for regenerative medicine in future? How can Indian public and private researchers help?

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First of all, the role is extremely widespread. So regenerative medicine from the replacement of joints as AIIMS director, Dr M C Mishra mentioned in the conference, a lot of people are now suffering from burn, acid burn, thermal burn. Tissue engineered skin can come back and drape you. So if you have a stroke, you take neuro tissue trying to replace parts of the brain and try to replace part of the heart after you have had a heart attack. I mean there is hardly anything that you can name where regenerative medicine would not have any application. Now will they all be applied at the same time? No they will not be applied all at the same time. The low inkfruits in my opinion today are the skin, cartilage, bone, vascular grafts. As we learn more from these organs, we will gradually move into the heart. The heart does a lot of prevential work. But clinically so far it

never did. It is same with the brain, you mess around with those organs and you can kill the person, so you have to be concerned about safety. Thus it is a natural progression and it will work across organ systems.First of all to recognize, this is a field which should be introduced as an organized discipline in all the institutions. You know, a kid comes in and they don't know what even exist. So there has to be departments, there has to be a key part of regenerative medicine. A critical part of regenerative medicine is to have an inter-disciplinary team, a team comprising of bio materials expert, bio pharmetics expert, engineering expert, medicine experts and surgical experts. So it's a truly physics experts, chemistry experts, mathematical modeling experts.

Q: Where do the challenges lie and how can we overcome these? What kind of support is required to accelerate the efforts?

You really need an inter-disciplinary team all of which does not usually have to be under one roof of the hospital. So to form those teams, we need to create the curricular activities that train our next generation doctors and then there also needs to be an assessment of what are the most burning needs of the Indian public and prioritize them accordingly. A few years ago there was no transplantation. So I want to become regeneration expert. Now they don't even know about it. And how to overcome these challenges, that can happen through wide recognition and establishment of departments and curriculum and diploma courses, degree courses, basic science side and create the inter disciplinary teams.

A clear partnership is required where the academia is working with the government working and also the industrial department. Academia will provide policy in a sustainable manner and again industry will work with academia. So the academia provides solution and the government enables that. So that type of a triangular relationship is a must. State collaboration with experts as well wherever they are. So that you are not trying to rediscover the wheel all by yourself and killing a lot of time. Especially a coDr Sen who also represents medicine and health sciences at the university's global gateway initiative, in an exclusive interview with the BioSpectrum, spoke about collaboration, product translation and the way forwarduntry like India that has certain unique characteristics which will provide data to the rest of the world because of the high volume.

Q: How can India and US collaborate and share knowledge in the area?

I think it should be great when India and US together partners in this. Now India has a national facility for regenerative medicines, so that is already an organization, there is admission for that and I was proud to inaugurate it. Secondly, we need to have a plan for the faculty visit, student visit and exchange program where on one hand there would be program which will be laid here and block the conversation. On the other hand, there will be some people who will go to our place, learn certain things and come back and then travel back and forth. And related to that, there needs to be a bi-national funding mechanism in the US and that will support the step up. The US money will support the US efforts and the Indian money will support the Indian efforts. It is a partnership between two equals and those are clearly some of the expectations and I am also hoping that at some point in the near future there would be specialization courses may be at the post graduate level or the master's level for regenerative medicine.