Dr. Sanjiv Narayan: "We need translational mentors"

05/03/2018

Dr. Sanjiv Narayan participated in the CNIC Conference 'Atrial fibrillation: from Mechanisms to Population Science' held at the CNIC in November of 2017.

The dual training of Dr. Sanjiv Narayan, professor of medicine and cardiologist at Stanford University (USA) and biomedical engineer, allows him to have a global vision of medicine and research. Therefore, for years, he has been trying to integrate the computational and analytical methods in clinical practice to improve the results in terms of prevention and treatment for the patients´ benefit. Dr. Narayan is co-founder and director of the Stanford Arrhythmia Center, a center whose mission is to develop a leading therapy for heart rhythm disorders based on patient-centered research. In addition, as Director of the Computational Arrhythmia Research Laboratory, Dr. Narayan has developed an extramural program for atrial fibrillation (AF) and ventricular fibrillation (VF), applying analytical methods and automatic learning models to define the mechanisms of arrhythmias. His work allowed for the identification of rotational activity (rotors) responsible for the maintenance of human cardiac fibrillation. **His studies have shown that ablation based on the removal of these rotors improves the results of therapy in patients with AF**. Thus, the understanding of the factors favoring AF and VF has become an important clinical and research area. Furthermore, Dr. Narayan is a passionate mentor and has tutored numerous graduate students in bioengineering, residents and medical students. Dr. Narayan, participated in the CNIC Conference 'Atrial fibrillation: from Mechanisms to Population Science' held at the CNIC in November of 2017.

- **What is your current area of research?**

For two decades I have been investigating the mechanisms of atrial fibrillation (AF) and how this knowledge can allow us to give patients suffering from this heart disease a better treatment. The work that we have developed in recent years has been based on seminal work by Professor José Jalife and others, and we were able to demonstrate that rotational activity (rotors) can drive the disorganized activity of AF and many patients with ventricular fibrillation. Between 2000 and 2011 we tried to map the AF with the objective of establishing whether or not there is rotational activity, using bioengineering signal processing methods, computational biology and novel hardware design.

At this time, our objective, among others, is to try to understand why there are differences in terms of results when using different mapping systems. That is to say, in some cases the methods show these rotors as 'engines' of AF, but in others they do not. In addition, we also want to determine the underpinnings of AF drivers and their interplay with disorganized activity at the cellular level in humans, as we have already seen in animal models.

- **Does that mean that these ‘engines’ of AF are a target for therapy, present of future?**

We believe that they can be a present target for therapy via ablation. But that is not the only goal of our investigation; our idea is that, thanks to a deeper knowledge of rotors and other drivers, we can facilitate many forms of AF therapy. But for this we need a greater knowledge of the characteristics of the tissue of these drivers control. In the future, this may enable the design of preventive strategies or genetic therapies based on the individual phenotype of each patient.

- **How do you see the treatment of AF in the next 10 years?**

My hope is that in the next 10 years we will have more sophisticated systems to phenotype individual patients and personalize therapy. I expect that we will have continuous sensor systems that will provide us with precise and detailed information about AF as well as other conditions, enabling us to ‘profile’ a patient, discern different diseases that make up AF, and make more accurate decisions. Advances in imaging techniques and biochemical sensors will allow, without doubt, a more specific approach to AF.

- **How did you become interested in science?**

Actually, ever since I can remember I have always liked science. My passion for computer science started when I was 14 years old, but at that time there were limited options to combine computer methods with medicine. I thus studied medicine directly, but always with the idea of going back to computational research. During my residency and fellowship as a cardiologist I discovered that electrophysiology was an ideal avenue to combine my interests in medicine and computer science to treat patients.

- **You have always emphasized the figure of the mentor and, as such, practice in your center. What advice or recommendations do you give young researchers?**

First of all: follow your passion! You'll always be better if you do something you really like. Second, find a good mentor: it is advisable to be in permanent contact with him or her and take time to develop the work. One is not aware of how important it is to have a good mentor until you do or do not have one! I try to be a good mentor to my students in the laboratory. In my opinion, one of the major challenges in clinical science is the lack of training of the next generation of clinician-investigators by current senior figures. Another challenge is the gap between basic and clinical researchers. This is an área that we try to bridge in our laboratory. It seems that at the CNIC this problem has been resolved very well.

- **What is the most passionate thing about your job?**

From a personal point of view, I believe it's fascinating to have the opportunity to apply bioengineering to a field as complicated as biology to treat patients. In the 90s I was already trying to apply artificial intelligence to medicine, but the problem appeared too complicated. The tools may now be emerging, and I think we are at the beginning of the next era in using computational methods to advance systems biology and translational medicine. It is possible that this will define scientific research in coming decades.

- **What's your opinion of the CNIC?**

All institutions should aspire to be leaders in their field. This requires visionary leadership, interdisciplinary science and relevant sources of financing. The CNIC achieved this model exceptionally well, without a doubt. I learned about the CNIC through Dr. Fuster and Dr. Jalife. A center with these characteristics, which uses the latest advances in computational technology, image, genomics, focused on translational research and directed at patients is really something unique in this world and is present here at CNIC.

Dr. Narayan, participated in the CNIC Conference 'Atrial fibrillation: from Mechanisms to Population Science' held at the CNIC in November of 2017 and organized by David Filgueiras, José Jalife and Miguel Manzanares, from the CNIC, and Stephane Hatem, from the University of Sorbonne, Paris.

Source URL:https://www.cnic.es/en/noticias/dr-sanjiv-narayan-we-need-translational-mentors