Interview: Professor Xavier Nassif – Institut Necker Enfants Malades (Necker Institute for Sick Children) (INEM), France

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The Director of the newly formed Necker Institute for Sick Children reveals how

the *inspiration behind INEM was to bring people together in order to create a common scientific policy and campus spirit and why collaboration between clinicians and researchers is crucial in a, which is heavily reliant on scientific innovation.*

The Necker Hospital for sick children was set up almost a century ago in 1926. However, the Necker-Enfants Malades Institute is a very recent initiative which was only set up in 2014. What do you hope to achieve through the establishment of this molecular science center?

There are two research institutes linked to the Necker hospital; the Imagine Institute for Genetic Diseases and the **Necker-Enfants Malades** Institute (INEM). The Necker Campus was reorganized resulting in the creation of these two institutes, both roughly the same size. Beforehand, we had INSERM units (National Institute of Health and Medical Research) each of which had between twenty and fifty researchers. They were all linked to a clinical department but their size meant that there was no real common scientific community. The inspiration behind INEM was to bring people together in order to create a common scientific policy and campus spirit, providing the additional

advantage of our research being more visible from the outside. Besides that, we have a structure called the federal research structure hosting facilities for imaging, genomics, proteomics, amongst others. We share everything and these platforms are being supported financially by the two institutes.

What is unique about this institute?

What is unique is the will of our scientists to link up with the hospitals. The real world is the patient. The hospital clinicians here are very much linked to our institutes and allow us to discover new therapies for the benefit of patients. This is something that has always been unique at Necker. Stethoscope has been discovered at Necker, the first kidney transplantation took place here and then the first gene therapies were carried out here in the early 2000s by scientists from the Imagine Institute. So Necker has a history of novelties. If you look at the research teams, many of them are headed by people who have a background in clinical duties.

What are the main priorities which you set yourself upon taking on the role of Director and what are the main challenges that you have faced?

The number one priority for the Director of INEM is to recruit the best talent capable of true innovation and able to attract grants. We have already recruited four talented young investigators in the last eighteen months including a professor who just won an award from the European Research council. This is particularly important just now as some of our current Principal Investigators (PIs) are close to retirement age.

What are some of the ground-breaking research projects being carried out by the institute just now?

The INEM is divided into two departments; the first is dedicated to cell biology in which we have people working on cystic fibrosis, metabolic diseases, autophagy and neurobiology. There are two teams working on nephrology which is a tradition at Necker, including one group researching prostate cancer. The second department, made up of five teams dedicated to immunology, infectiology and hematology. Immunology research is very important for the hospital because a lot of our patients are immundepressed so understanding the immunology of those patients is fundamental.

In France, collaboration between the public and the private sectors used to be a touchy subject. Does INEM collaborate with private institutions such as pharmaceutical or med-tech companies?

Some people believe that scientists and researchers should not collaborate with the industry, on the other hand, the future of our country like many others is heavily reliant on scientific innovation. I truly believe that an academic institution should have links with the economical world. For instance we will be moving in a new building in a couple of years and I intend to rent some of space to companies. This will be an opportunity for these companies that will be located within an outstanding academic environment. The networking opportunities this will create will allow companies to collaborate with our teams and will benefit our teams, the PI who will be able to develop collaborations and the post doctorates and PhD students when they are looking for employment.

France has long been considered a pioneer in medical research and innovation. What are the most notable evolutions you have noticed over the last few years?

What my colleagues are doing at the Imagine Institute is wonderful. The fact that human genome sequencing has been made available for patients is a true innovation. There is no doubt that French scientists participate in major innovations. It is sometimes difficult to know where an innovation is coming from. For instance in my field, microbiology, antibiotic resistance is a real challenge and a new antibiotic, Avibactam, should be soon available. This antibiotic, even though it will be sold by a foreign company, was first discovered in France.

What is your assessment of France’s capabilities in the research and development arena nowadays in comparison to other leading innovators such as the US?

I believe that we have very good French scientists with a great potential for innovation. However, the difference between the French and some other systems is that the flexibility of some foreign systems is likely to make it easier for an innovation to go from the bench to the clinic.

What would you say are the main challenges faced by researchers today?

The main challenge and threat is funding. The France National Research Agency (ANR), which is the major funding agency, is funding only nine percent of the applications it receives, which is too low. A good funding percentage would be around 20-25 percent. Nine percent of funding means that a lot of good projects will be rejected. The dark side of this is that to reach a decent level of funding by the ANR, we are not talking billions of euros but rather of a few hundred million for the ANR so that it can support promising initiatives.

What is your vision for the future of the INEM for the next five years?

I would be very proud if the INEM had recruited 3 to 4 very prestigious well funded investigators making discoveries of clinical relevance. In addition a criteria for success would be to have establish close tights with private companies being hosted in half a floor of our building

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