Enhancing US-Portugal Biomedical research Collaboration

Report on the Meeting that took place on the 27 of March 2017 – USA Ambassador’s Residence, Lisbon

1. Introduction
Under the auspices of the USA embassy, through Herro Mustafa (US Embassy), Avraham Rasooly (NIH), Miguel Castanho (FCT) and Maria Salomé Pais (Lisbon Academy of Science), a large number of Portuguese scientists from the Biomedical field located at institutions from all over the country met to discuss the current state of US-Portugal Biomedical research collaboration. It had become apparent that even though the Portuguese Biomedical community has expanded greatly over the years and has shown very high quality standards, very few if any Portuguese scientist currently participate or have participated as Principal Investigators (PI) on NIH funded grants. This state of affairs raises concerns as to the need to discuss, evaluate and eventually promote new and more dynamic forms of collaboration to bring together these two communities. The meeting that took place in Lisbon was very active and promoted intense discussion looking at the past but mostly thinking about future initiatives that could remedy this situation.

2. A history of mostly individual collaboration
All the panels were unanimous in considering that there is a long tradition of individual collaborations between research groups in Portugal with groups in the US. In many cases these collaborations have resulted in significant scientific success for both sides. However, it was clear that most of these collaborations are informal and only in very few cases the collaboration have resulted in formal NIH funding to the Portuguese partner and always as collaborator not has a PI. More frequently, collaborations have been fuelled by Portuguese graduate students and post-docs, funded by FCT or FLAD (Fundação Luso-America para o Desenvolvimento) who have spent some time in laboratories in the US. Additionally, current programs such as MIT-Portugal or Harvard Medical School-Portugal have promoted scientific collaborations, however, these where funded by the Portuguese side only. There are also many research groups in Portugal that have obtained grants from private American Foundations allowing in some cases to establish fruitful collaborations. Finally, it also important to mention that there is one important Portugal-US initiative intimately associated to the programs developed by FLAD which specifically targets students and researchers to present work at conferences or to spend short periods of time in the US but it is not dedicated to the Biomedical sciences but to all areas of knowledge. This preliminary analysis clearly revealed that there is no national strategy on how to develop a more balanced and fruitful collaboration between Biomedical researchers in Portugal and the US.

3. Priority areas of Biomedical Research
One important question that was discussed extensively was whether Portugal should define priority areas of research to be put forward for the development of more stable collaboration between two sides. Although it was clear that there are important areas such as Neurobiology, Bioengineering and Immunology, these do not exclude others such as pre-clinical and Clinical research in many diseases such as cancer, or cardiovascular diseases. Essentially, it became clear that Portugal might have some unique resources and capabilities that could be of general interest to the US biomedical research community and that could form a basis for further collaboration. These include the reality of a national Health care system in Portugal with well-organized nodes that could provide the basis, for example for researcher driven clinical trials. A highly developed higher education system that has proven to be very effective in training undergraduate students and a strong scientific system comprised of Research Units and Associate Laboratories that together with the Universities provide a very strong system for training graduate students. But there could also be other areas in Portugal
that could provide a unique resource such as the very large marine ecosystem where the search for new bioactive compounds should be appreciated and explored.

4.- Unmet scientific needs in Portugal
Although the Portuguese scientific system is relatively new, it has developed over the past 25 years with great speed and intensity accumulating and developing competences and most areas of including Biomedical Research. In Portugal, Biomedical Research accounts for about 25% of total research and its levels of productivity are very significant reaching publications in top level journals and being recognized with one of the highest levels of European Research Council (ERC) funding. Thus, there are indeed few really unmet needs in this area but at least two stand out. Nevertheless, one area of rapid technological development which Portugal has not been able to accompany is high-end Cryo-electron microscopy. This new technology is beginning to transform the way structural biologists determine the higher order molecular structure of multisubunit protein complexes and should play a major role especially in drug development. No access to this type of infrastructure in the near future will be an important handicap not only for basic biomedical molecular research but also for drug design. A second and also very important handicap is the complete absence of a national approach for the implementation of a large library of chemical compounds that could be used for drug screening. In an age in which the advancement of molecular therapeutics is the front end of Biomedical Research, both of these handicaps make Portugal less likely to make an impact world-wide. Interestingly, a solution for both of these problems could be idealized through enhanced US-Portugal collaboration.

5.- Knowledge transfer and the creation of value
An important discussion took place in a number of the panels raising the question of the application of research results to industry and the creation of value in the Biomedical field. It was agreed that Portuguese scientists have little experience in this area but that the creativity already shown suggests immense possibilities for the future. This is an area in which the US has shown international leadership and which could also form the basis for future cooperation.

6.- Current US-Portugal programs
Currently there only a few programs that address the collaboration between Portugal and the US and only one of them is dedicated to the Biomedical sciences and that is the Harvard-Portugal program which in its current form only really benefits clinical research. FLAD recently developed a specific program for Biosciences but it is in the form of 2 collaborative grants every two years. The other two programs in place such as MIT and Carnegie Mellon, marginally address biomedical research while their major interest is the engineering sciences generally. So, one aspect that was discussed was whether there is a need to redirect some of these programs towards the biomedical sciences and to what extent these programs should continue or be completely reorganized.

7.- Proposed actions
So, the overall conclusion from the Portuguese scientists is that there is no continuous and robust program that promotes US-Portugal Biomedical science collaborations and that there is an urgent need to propose new avenues that could enhance collaboration. Overall, the greatest limitation was considered to be funding, since there is virtually no specific programs that funds these initiatives making it very difficult to sustain activities that started informally regardless of their success. So, it was considered essential that FCT, FLAD and NIH work together to define a set of programs that could promote collaborations that could include:

a) Signature of a bilateral agreement that defines a medium-term program with defined funding from both sides to support scientific collaborations
b) Organize an annually US-Portugal Biomedical congress that could bring together researchers and serve as the basis for funding applications both in Portugal and the NIH

c) Organize a data base of Portuguese scientists working in the US, as well as a data base with all Portuguese students and postdocs currently working in the US

d) Promote the organization of a network of Portuguese scientists that currently have or have held in NIH grants in the past and organize workshops in Portugal trains scientists on how to apply to NIH funding

e) Promote workshops and courses on intellectual property, copyright, licencing, industry contract research, and generally on how to promote knowledge transfer, entrepreneurship, spin-off and start-ups.

f) Finally, to create a new program of collaborative grants (or extend the one FLAD has presently - 2 grants every other year of up US$ 400,000 for 4 years each). Ideally, to guarantee 5 grants of similar amount per year.

8. Conclusions
A rapid and perhaps rather superficial analysis of this meeting and its outcomes provides a very clear impression that US-Portuguese collaboration in Biomedical areas could easily develop and become rapidly very strong. Some of the basic hurdles have been identify and while funding is really an important element, it not the only one. Some of the proposals indicated abode do not involve large sums but could result in major changes in the way US and Portuguese Biomedical researches see one another. This could easily be a first step in developing a more stable and long-term relationship that is essential to build meaningful collaboration for both sides. It is clear that the time is now right for the Portuguese (FCT, FLAD, etc) and US (NIH) agencies to work together and define a program to foster collaborative research.

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