# Fernando Peláez – President, SEBiot, Spain

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*The Spanish Society of Biotechnology (SEBiot) is a non-profit organization established by academics and researchers to promote the sector through knowledge exchange and is a Branch Office of the European Federation of Biotechnology (EFB). Its current president, Fernando Peláez, explains the main activities of this scientific society, how SEBiot is funded, and analyzes the main areas of research and challenges for the biotechnology sector in the country.*

**Since this is the first time we have interviewed you, could you start by sharing a brief introduction to your career and responsibilities as president of the Spanish Society of Biotechnology (SEBiot)?**

My background is in biology with a specialty in biochemistry. Following my PhD in Biochemistry and Molecular Biology, I joined the research centre of Merck Sharp & Dohme (MSD) in Madrid in 1989 and worked there for almost 20 years. I began in drug discovery based on natural products from microbial origins. We isolated bacteria or fungi and attempted to make them produce metabolites that could have some therapeutic application. This laboratory was very successful; the research developed there since the mid-50s originated several drugs that reached the market.

My specialty changed more toward microbiology during my time at MSD. I specialized in fungi as head of the fungal program and I became a mycologist which involved further academic work in mycology. I published work in fungal ecology, fungal taxonomy, fungal phylogeny, and also

discovered new fungi that produced interesting metabolites.

In my time at MSD, we patented a significant number of compounds. I am an inventor of approximately 40 patents, however, only one made it to market. This was recently approved and therefore it took almost 25 years to reach the market.

I was appointed as the director of the research centre towards the end of the 90s and remained in that role for around nine years. We were the centre of reference within MSD research laboratories across the world to run screens oriented to detect side effects and undesirable traits in drugs under development. These drugs under development have to be clean on target, and with the right pharmacokinetic profile for it to behave in a safe manner without interfering with other systems. Therefore, the research centre in Madrid ran these screens for the entire MSD community which medicinal chemists then made decisions on which compounds to progress further.

Nonetheless, following a restructuring process for MSD in 2008, the research centre was shut down to consolidate the highly fragmented sites. The assets and people from this subsidiary were then moved to a new centre that the regional government in Andalusia created as a joint venture set in Granada.

However, at that time I was offered the opportunity to join the National Cancer Research Center (CNIO) as director of the Biotechnology Program, supervising the core facilities of the centre, including genomics, proteomics, animal facility, histopathology, flow cytometry, confocal microscopy, molecular imaging, monoclonal antibodies, and mouse genome editing. I am working at the CNIO since December 2008 to date.

As president of SEBiot since 2018, my main role is to lead and coordinate the activities of this scientific society, supported by the Executive Board.

**How would you describe SEBiot’s mission and objectives as a non-profit organization promoting Spain’s biotech sector?**

The Spanish Society of Biotechnology started as an initiative from a group of academic professors and researchers that were working in different aspects of biotechnology in the mid-80s.

The Society provides a network for researchers in biotechnology by organizing meetings periodically. The main activity of SEBiot is the organization of the National Congress of Biotechnology (BIOTEC) which is held every two years. Furthermore, SEBiot is organized into

sections focused on different aspects of biotechnology, with some of these sections having their own internal scientific meetings and activities. Additionally, we provide information to our stakeholders through our webpage and a periodic newsletter (FUTURUM).

SEBiot is a relatively small organization, and in Spain there are many scientific societies. As a result, one of the main challenges for us is to acquire sufficient associates to become powerful. Comparatively, other scientific societies in the country with a longer existence may have more people working in biotechnology than we have. Furthermore, biotechnology is a highly fragmented field, as a consequence of the diversity of activities within the sector, creating additional challenges.

**How is the organization funded?**

We are funded through three mechanisms. Firstly, SEBiot is funded through the fees charged to the members, which are one of the most affordable in Spain across scientific societies. Secondly, we are funded by industrial sponsors whom we offer visibility by sharing their logos and information on their products on our webpage in SEBiot's newsletters. Finally, SEBiot is in charge of the administrative management of a Master of Bioinformatics organized by several prestigious institutions in Spain (ISCiii, CNIO, BSC), which provides further income to the society. Also, by providing assistance to this Master of Bioinformatics, SEBiot aligns its funding with its mission to facilitate the spread and diffusion of biotechnology in all of its branches and activities.

**What is happening in the field of biotechnology in Spain that PharmaBoardroom's audience should know about?**

The importance of biotechnology has become evident for the entire world due to the pandemic. The vaccines used to fight COVID-19 are pure biotechnology and Spain is working on developing its own vaccines. Several organizations are being able to achieve feats in biotechnology with significantly fewer resources than the big pharma companies. A number of the vaccines they are developing may still come to market, particularly as the coronavirus is not yet finished.

**What are some of the recent breakthroughs produced in the Spanish field of biotechnology?**

Biotechnology in the health field has flourished into new companies emerging as spinoffs of academic centres to explore specific knowledge. Just as an example, a new company called Telomere Therapeutics has recently emerged as a spinoff from a research group at CNIO based on their expertise in telomerase [enzyme responsible for maintenance of the length of telomeres by addition of guanine-rich repetitive sequences] and the use of gene therapy based on telomerase to exploit the possibility of tackling some pathology such as fibrosis.

These spinout companies have been occurring increasingly frequently across Spain in the last few years. However, these companies seldom evolve to the next level of introducing a new product to the market or being purchased by a large company. Obviously, this is not surprising, considering the many difficulties and challenges encountered along this process.

**What is missing for these companies to make it to the next step?**

The main problem in Spain is that the funding dedicated to research and innovation is clearly insufficient, and the training or education of the scientists may not always align with the specific biotechnological sectors. The Spanish biotechnology ecosystem is not as mature or comparable to that of the United States, Germany or other advanced countries.

For example, a research group may have results that they identify as the origin of a possible commercial product or service. However, they often lack the resources, knowledge, and professional support from their institutions to become engaged in an innovation project with a chance of success. These groups require further financial scope and expert support to establish a company with the right talent, a clear vision and a realistic strategy to pursue the next steps in the process, and sufficiently clear milestones and objectives to get to the end.

Many years ago, companies would have paid significant funds for any compound with just preclinical data associated. Today, however, companies are increasingly cautious towards licensing, and require clinical data to be provided in phase one or two, which is difficult to achieve from the public sector. Between the last steps of lead optimization and the point of testing human subjects in preclinical development, toxicology studies and manufacturing of the product with good manufacturing practices must be conducted, which are out of the field of expertise of those that originally discovered and characterized the compound. Also, the level of funding required to go through these steps is often beyond the reach of these small companies.

As a result, many efforts are interrupted at this stage. However, initiatives from organizations such as Farmaindustria (the association of pharmaceutical industry in Spain) are trying to bridge that gap by organizing a series of meetings and inviting academic groups that generate results and pharmaceutical companies that may have an interest in their work.

Although there are no easy solutions, some obvious hints can be identified. The institutional and legal support is often weaker than needed, and it should be fostered. Also, incentives to academic researchers working at public institutions to become engaged in innovation projects are not always clear due to the complex regulation, this should be potentiated. Furthermore, the majority of SEBiot's associates are academic, working in universities or independent research centres, few are coming from the private sector, therefore they are often missing the expertise required to get through all the steps in the innovation process. Complementing the research expertise of academic scientists with more business-oriented professionals would be critical to maximizing the chances of success of bringing their projects to the market.

**As a long-time researcher, how would you characterize the strengths of Spain's research efforts?**

Spanish biotechnology is very strong and internationally competitive in many fields, including among others biocatalysis, nanobiotechnology, microbial biotechnology, and cancer research. Spain's productivity of research measured as a number of publications per year on a per capita basis is really significant and we are well-positioned at the international level. However, the system does not favour moving these discoveries to the next level, the innovation phase. Whereas the offices of technology transfer have improved across the last decades, they still lack sufficient people, resources and sometimes the right expertise and experience to accomplish the work.

This is predominantly a numbers game. The chances of succeeding in the innovation process are really low, only one across many newly generated companies ever gets to see commercial success. The fewer companies established in Spain compared to those of other developed countries determines that the overall chances of success for the biotechnology sector are therefore significantly lower.

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