Monica Bettencourt-Dias – Principal Investigator & Former Director, Gulbenkian Institute for Science (IGC)



The funding landscape for science in Portugal is facing challenges that stem from a decrease in overall investment and shifting priorities. Despite the evident role of blue-sky research, exemplified by important contributions to critical advancements like RNA vaccines, there has not been a corresponding increase in funding

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Monica Bettencourt-Dias of the Gulbenkian Institute for Science highlights the IGC's pioneering role in biological sciences, supporting scientists and innovators who have significantly contributed to the field globally for over 63 years. She also touches on Portugal's scientific excellence, how the IGC is balancing fundamental research with initiatives for technology transfer and commercialisation, and how it will tackle ongoing challenges related to funding and international recruitment.

Could you provide an overview of the Gulbenkian Institute for Science (IGC) and its significant contributions to the field of biological sciences in Portugal and globally?

The IGC stands as one of Portugal’s oldest scientific institutions, boasting a 63-year history marked by substantial contributions to biological sciences. Renowned for pivotal advancements and innovations, the IGC has been instrumental in incubating scientists, with a focus on providing support for up to nine years, nurturing individuals who have gone on to establish their own labs globally. Its mission extends beyond Portugal, similar to other institutions like EMBL (European Molecular Biology Laboratory), CRG in Spain, and Max Planck, leading to more than 100 individuals passing through the IGC and emerging as influential figures in their respective fields.

Notably, the IGC has been a trailblazer in transforming Ph.D. programs. Pioneering a unique approach, it initiated a program allowing candidates to attend classes with global experts in Portugal for a year, followed by the flexibility to pursue their Ph.D. anywhere in the world. This initiative has resulted in a significant number of professionals returning to Portugal after completing their education abroad, contributing to various sectors, including research, industry, science communication, and science management.

The IGC's impact is evident in the prestigious memberships of its alumni in organizations such as EMBO, where 57 percent of Portuguese members have ties to the IGC. Moreover, it has played a pivotal role in securing 46 percent of life sciences researchers' grants from the European Research Council within Portugal.

Overcoming the challenge of competing with institutions in geographies with higher average wages, the IGC stands out as a pioneering institution, especially in providing shared infrastructure for group leaders, setting up everything from microscopes to sequencing facilities, which is a notable departure from practices in the United States. This shared infrastructure, along with the IGC's commitment to empowering students on their projects, has been a significant attraction for group leaders and researchers. The institute's focus on reducing size to enhance conditions for group leaders has been instrumental in recruiting top talent, with a majority securing European Research Council grants. Despite the general perception of scientific development in Portugal, the IGC's reputation in the scientific community has grown, attracting top-notch researchers from renowned institutions like Rockefeller, Pasteur, Max Planck, and University College of London. The IGC's combination of excellent research conditions and a high quality of life in Portugal has made it an appealing destination for scientists worldwide.

Considering the significant percentage of group leaders coming from abroad, are you observing an increase in international students as well?

The IGC actively fosters an internationalized environment, attracting a diverse student body. While 40 percent of group leaders hail from abroad, the IGC has also seen a notable presence of foreign students and postdocs. However, the global landscape is evolving, with a broader trend indicating increased difficulty in recruiting talent, particularly in the context of students and postdocs. This phenomenon is not unique to the IGC but reflects a wider shift in attitudes post-COVID, where individuals are more hesitant to engage in extensive travel.

Acknowledging this challenge, the IGC is proactively adapting to ensure its continued appeal to international students. The institute is committed to creating conditions that make academic pursuits and scientific careers at the IGC still compelling and worthwhile. By addressing changing attitudes toward travel and career choices, the IGC seeks innovative ways to maintain its position as an attractive destination for aspiring researchers. This adaptability is crucial in navigating the evolving dynamics of global scientific collaboration and ensuring that the IGC remains a top choice for students and postdocs from around the world.

Could you elaborate on how the IGC balances its commitment to fundamental research with initiatives promoting innovation and tech transfer? How does the IGC navigate this challenge while fostering an environment that supports both basic science and potential commercialization efforts?

The IGC's core mission revolves around fostering discovery through blue-sky research,. This model allows researchers the autonomy and flexibility to explore an array of scientific domains, extending beyond the confines of biomedical sciences to encompass areas like evolution and ecology. An illustrative example is a recent addition to the institute focusing on phytoplankton communities within the context of global warming, emphasizing the IGC's commitment to fostering a diverse range of scientific pursuits interlinked by the study of organisms within their environment.

In addition to its predominant focus on research, the IGC has embarked on initiatives to promote innovation within its ecosystem. Over the last five years, the institute established an innovation unit sponsored by the city council of Oeiras, signaling a strategic move toward bridging the gap between research outcomes and real-world applications. This unit introduced pioneering programs, such as a proof-of-concept exercise, designed to empower group leaders and postdoctoral researchers to secure funding for the development of innovative products. Remarkably, this regulatory model has been adopted by numerous other institutions, underscoring the IGC's role as a trailblazer and pilot for fostering innovation. The exercise involves a thorough review by diverse professionals worldwide, including representatives from companies, patent lawyers, and innovation offices, contributing to the institute's mission of nurturing innovation within its community.

While the IGC remains rooted in blue-sky research, the foray into innovation has yielded tangible results. Notably, the institute successfully licensed its first product during the COVID-19 pandemic — a diagnostic tool for SARS-CoV-2 antibodies. This marked a significant stride toward translating cutting-edge research into practical applications with societal impact.

The IGC is undergoing a transformative phase, witnessing a surge in groundbreaking research outcomes and heightened patent activities. This shift reflects a growing openness to diverse approaches and a commitment to translating excellent science into tangible solutions for society. The institute emphasizes fostering a culture where innovative ideas are actively pursued, supported by the IGC. Noteworthy success stories include ventures like Ophiomics, originating from a former IGC group leader specializing in computational evolutionary biology. This company delved into cancer prognosis and transplantation diagnostics using bioinformatics, showcasing the potential impact of the IGC's commitment to blue-sky research. Another example involves another former group leader working on Drosophila, who established a company focused on testing drugs related to epithelium, Thelial Technologies S.A. These success stories highlight the IGC's role in nurturing an entrepreneurial spirit among its researchers, leading to significant advancements. While maintaining a primary focus on fundamental exploration, the institute acknowledges the financial challenges of being a small country with limited funding for scientific endeavors.

Can you provide insights into the current stability of funding for research at the IGC, and what trends or challenges you are seeing in this space? Additionally, given the critical role of basic science in the development of solutions during the COVID-19 pandemic, do you anticipate a shift in priorities towards increased investment in research and science, both in Portugal or across Europe?

The funding landscape for science in Portugalis facing challenges that stem from a decrease in overall investment and shifting priorities. Despite the evident role of blue-sky research, exemplified by important contributions to critical advancements like RNA vaccines, there has not been a corresponding increase in funding. Expectations for a post-COVID emphasis on investing in such crucial science have not materialized in Portugal or Europe.

In Portugal, the investment in science has decreased over the years. A stark illustration is the success rates for obtaining grants, which have significantly dropped—from around 30 percent when we started the lab in 2006 to a mere 5 percent today. This decline poses a considerable challenge for sustaining long-term visions and attracting high-caliber talent. The IGC's core funding, provided by institutions like the Gulbenkian Foundation, has been instrumental in offering stability and enabling a forward-looking perspective for researchers.

The connection with society is another aspect where dedicated funding has made a difference. The City Council of Oeiras, for instance, has been innovative in allocating a significant portion (1-2

percent) of its budget to science. This investment has enabled initiatives that promote internationalization and innovation and connect science with citizens, schools, and society at large. The IGC's outreach programs, supported by this dedicated funding, encompass citizen science, science in schools, and efforts to promote diversity in the scientific community.

The long-term importance of these investments lies in nurturing the next generation of scientists, promoting critical thinking, and fostering diversity. These initiatives not only lay the seeds for future scientists but also contribute to the broader societal understanding and engagement with science. Despite challenges in the funding landscape, the IGC remains committed to advancing fundamental research and maintaining its connection with society through innovative programs made possible by dedicated funding from supportive institutions and foundations.

The IGC has had a historical relationship with industry sponsors, notably Merck. Could you elaborate on how the institute traditionally interacts with pharmaceutical industry partners, both local and international?

The IGC has maintained a longstanding and robust relationship with Merck. This collaboration has involved discussions about research and, more recently, initiatives focused on promoting diversity within science, aligning with Merck's commitment to diversity in its workforce. The partnership has endured over time, showcasing a strong and sustained connection.

In recent years, the IGC has extended its collaborations with the pharmaceutical industry through its innovation office. Engagements include partnerships with Medinfar and other pharma companies, with a specific focus on developing diagnostic tests, such as during the COVID-19 pandemic. These collaborations demonstrate a willingness to work with industry partners on projects that align with the institute's expertise and goals, such as immunology and virology.

While there may still be some resistance within the IGC community to industry collaborations, the innovation office is actively working to address this. Efforts include encouraging open-mindedness among researchers and facilitating discussions about the potential significance of their ideas in collaboration with companies. The institute is becoming more open to engaging with the pharmaceutical sector, recognizing the value of such collaborations.

To further foster collaboration, the IGC is exploring initiatives like internships within the pharmaceutical industry. The goal is to create more fluidity between research and the pharma sector, providing opportunities for students, postdocs, and researchers to gain experience and

contribute to both realms.

How might the increased collaboration with industry impact clinical trials in Portugal?

The collaboration with industry has the potential to significantly impact clinical trials in Portugal. Currently, the country faces challenges due to a stretched National Health System and prolonged approval timelines from ethics committees. The IGC is actively involved in one ongoing trial in Germany, indicating the institute’s commitment to navigating the complexities and contributing to advancements in clinical research. However, addressing the organizational gaps and providing medical professionals with the necessary time for research remains crucial for fostering a more conducive environment for clinical trials in Portugal.

Do you have a final message for our international audience?

Portugal possesses an impressive critical mass in terms of well-trained professionals, making it an excellent destination for science and research investment. The country offers a strong workforce and internationally recognized research institutes. While it’s a great place for commercial offices, it’s also ripe for pharmaceutical companies to consider it for research and development. The government’s investment in organizing clinical trials and biobanks, and regular funding for research, will make it even more appealing for such companies. Additionally, there’s untapped potential for private donors to contribute to research endeavors, and Portugal’s unique connection with many African countries could open up collaborative opportunities, aligning well with the increasing global focus on diversity in pharmaceutical initiatives. It’s a story worth exploring and amplifying on the international stage.

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