

## **German American Conference October 2022 – Whitepaper Lessons from Boston Life Science Cluster**

As Germans trained in science in Germany and the US and with combined over 30 years work experience, on October 29, 2022, we conducted a workshop at the German American Conference at Harvard with students and life science professionals and would like to share our experience from the Boston life science cluster. With its unique combination of universities, hospitals, venture capitalists, startup companies, experienced operating personnel and large pharma and biotech companies, Boston features the world's premier life science cluster, and Germany can benefit from its inspirations. We would like to focus here on its research and translational aspects in particular:

### **Research:**

**Academia:** Germany features world-class science and research; however Principal Investigators are more accessible at US universities and engage in regular discussions with their students since quality of teaching is being evaluated. Many laboratories in the US publish more papers and in higher-impact journals than German universities. At the same time, research at German universities is often more applied than the basic research at US universities. Despite the recent discussion on affirmative action, US laboratories feature more international students than German universities – due to the high quality of the research and the English language. In the US, students very early on also learn to write and present their research fluently. Admissions committees also take not only past achievements into account but also assess learning agility.

Many academic laboratories have collaborations with the private sector and therefore build relationships that benefit research because of e.g. data availability, but also might benefit their students for future employment opportunities.

**Funding:** Despite grants from the European Research Council, funding is more abundant for US research (e.g. DFG spent EUR 3.6bn vs. NIH USD 55 bn). In the US, NSF also funds smaller research and HHMI is funding established researchers. Philanthropic funding is also more widespread in the US (see e.g. the Wyss Institute at Harvard or the Blavatnik fund for startups at Harvard and Yale).

Funding in Germany is relatively evenly distributed whereas funding in the US is focused on institutions on the East and West coast.

US universities also exhibit very thorough branding, marketing, and alumni relations with which they augment their funding and enhance their community.

While studying is almost free at German universities, in the US fees can be as high as \$50 000 per year, leaving students in debt for years, but motivating them highly to provide their best efforts in their studies.

**Processes:** It was also mentioned that necessary procedures (like ethics approval for animal studies) were more efficiently conducted at US universities. Germany is a role model in its privacy regulations but needs to be careful that these don't stifle innovation.

While German students often choose their focus topics relatively early, flexibility (academic and geographic) is higher at some US universities like Harvard and Stanford where doctoral students conduct rotations between different laboratories before choosing.

Lastly, the US public is highly skeptical of science; while the German public condemns GMOs, the recent pandemic demonstrated that the German public largely trusts scientific messages from science politics.

### **Translational Science:**

**Technology Transfer** has developed significantly at US universities; with their mandate to translate basic science into benefits for society, these offices have become more and more sophisticated, and some generate significant income for their universities.

There are also a number of initiatives (e.g. the Blavatnik Fund at Harvard and Yale or LaunchPad at Stanford) that support the translation of scientific ideas into startup companies that can then be funded by investors.

Cross-functional collaborations (e.g. between biology and engineering at the Wyss Institute at Harvard) are also wide-spread in the US.

**Collaborations** between science in the academic and public sector is widespread in the US; In Germany however, academics regard the pharma and biotech industry suspiciously while it is often too cumbersome for industry to engage with academics. In the US, there are many entrepreneurial role models: several credible academics who have founded a number of successful startups (e.g. Robert Langer, a professor at MIT, is one of the co-founders of Moderna).

**Risk:** Germany is adverse to risk and rather unforgiving in case e.g. a company fails; in the US however, it is well known that 90% of startups fail, but the experience that executives gather during their time is well regarded, nevertheless.

**In summary,** Germany can benefit from the learnings of the Boston life science cluster. With world-class research, but an aging population, it could further attract international researchers by providing additional funding for research, facilitating translational efforts and providing (tax) incentives for startups.