

212b Networks of Hub Scientists in Commercializing Science from Academia, with a Case Study on the Langer Lab

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Biotechnology industry has burgeoned in the past 25 years, largely on the basis of ideas generated in academia: 9 of the 10 bestselling biotech drugs were originally discovered in academia and licensed to biotech firms (Edwards et al. 2003). Of venture backed companies in the Boston cluster, over 50% were founded on the basis of academic licenses. Furthermore, in each of the IPO windows, 30-50% of companies had academic origins and relationships with academics (Edwards et al. 2005). However, our data suggest that the commercial transformation of academia is centered on a relatively small number of institutions and, moreover, within those institutions, it is also skewed to a small number of so-called "hub scientists" who represent a significant proportion of licensing income, technology transfer, and entrepreneurial activities.

We define "hub scientists" as principal scientific investigators who have demonstrated a disproportionate involvement in local startup activity, either through licensing, founding, or advising early-stage life sciences ventures. We have analyzed the role of these scientists in early-stage venture creation within academic centers of innovation such as MIT. In particular, we have tested the relevance of their academic role, patenting activity, department/field, and publications as correlates of their hub behavior. In addition, we have analyzed the importance of the networks of relationships established through these collaborations as drivers of further startup involvement.

Professor Robert Langer's laboratory provides an exemplary case study of a canonical hub scientist in commercializing science from academia. As a joint faculty member in three MIT departments - Chemical Engineering (Course 10), Health Sciences and Technology (HST), and Biological Engineering (BE) - Langer has integrated a diverse group of students, postdocs, and researchers into his lab. Langer and his lab group have not only spawned tremendous innovation in the form of over 500 issued or pending patents but have also driven commercialization of his science, with technologies licensed or sublicensed to over 100 companies. Moreover, the Langer lab has spawned a cluster of startups, seeded with former students and postdocs. In this session, we will discuss the key characteristics and drivers of how the Langer lab has been successful in driving scientific entrepreneurship and commercialization within an academic environment based on a mix of interviews, first-hand accounts and quantitative analysis.