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CASE STUDY

Clearing Hurdles to Academic Startup Formation: How Editpep Became a Company

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Industry has the capacity to move at an incredible pace, and it's wonderful at deploying technology from academia that has reached a certain inflection point.

—ROSS WILSON, FOUNDER

Although Ross Wilson has spent much of his adult life in biology labs, first while earning his PhD and now as head of his own lab, his goal has always been to directly improve human health.

“If I could help one patient, that would be a huge accomplishment,” he said. “That’s motivating.”

Indeed, when he founded Wilson Lab—part of the Innovative Genomics Institute¹ founded by Nobel Prize winner Jennifer Doudna—he set translating research into CRISPR-based² therapies as its mission. In the lab, CRISPR can address many diseases at the molecular level in a cell, but a gulf remains between the lab and the clinic. “My lab is dedicated to the technology that would close the gap, turning these theoretical cures into real-world therapies.”

¹ The Innovative Genomics Institute is a partnership between UC Berkeley and UC San Francisco and has affiliates at other institutions.
<https://innovativegenomics.org/about-us/>

² CRISPR, short for clustered regularly interspaced short palindromic repeats, is used to selectively modify the DNA of living organisms.
<https://www.genome.gov/genetics-glossary/CRISPR>

Executive Director, Life Sciences Entrepreneurship Center and Professional Faculty member Darren Cooke prepared this case study with Associate Vice Chancellor for Innovation & Entrepreneurship and Professor and Former Dean Richard Lyons, and with assistance from Case Writer Elizabeth Whalen, as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

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In November 2021, Wilson made a key discovery that would help close that gap. Augmenting the CRISPR enzyme, which is made up of one piece of protein and one piece of ribonucleic acid (RNA), with a snippet of protein known as a peptide made it possible to deliver the enzyme to the brain, which had previously not been possible. The discovery opens the door to treating some of humanity's most vexing neurological diseases, including Alzheimer's disease and epilepsy.

Wilson immediately saw the promise of the discovery to address a huge unmet need in the private sector, and he wanted to move quickly. "The sooner we get proof of concept in the clinic, the sooner we can gain trust in the technology, and the sooner broad swaths of the population can benefit from this," he said. He considered the option of licensing the technology to companies because he'd seen how much faster industry could move than academia. "Industry has the capacity to move at an incredible pace, and it's wonderful at deploying technology from academia that has reached a certain inflection point."

However, Wilson had licensed some of his previous discoveries and found that the technology wasn't developed to its full potential. In some cases, there was no internal champion for the technology at the licensing company; in others, the company had an existing vision that wasn't built around the technology. To take advantage of the speed the private sector offered and to maximize the benefit of the technology, Wilson decided to start his own company. And then he went looking for people who could help.

By summer of 2022, Malavika "Malu" Kannuswamy was in the midst of her first semester as a student in Berkeley Haas's evening-weekend MBA program. After earning a master's degree in biotechnology and working in the field for a decade, she wanted to apply her experience in research and drug development strategy to building companies. To network, she attended campus events and soon met David Schaffer, Professor of Chemical and Biomolecular Engineering, Bioengineering, and Molecular and Cell Biology and co-founder of eight companies, including 4D Molecular Therapeutics, Inc., which went public in 2020.³ She asked him whether he knew of any early founding companies or professors looking for help. Soon, she received an email from an associate of Schaffer suggesting she connect with Wilson.

Kannuswamy and Wilson talked multiple times in late 2022, ultimately deciding they wanted to work together to start a company—a process that would require money, time, and much more.

Limits on University Support of Academic Startup Formation

Universities have long supported translational research—that is, the kind of work that Wilson's lab does—because they typically own the inventions made by their employees and can generate revenue from licensing those inventions. Many licensees are the academic inventors themselves, seeking to base a company on their discoveries.

Academic founders can access translational research funding that helps move discoveries from the research stage towards commercial viability. However, funding designated for translational research cannot be used for all of the activities necessary to develop a product or form a company, such as customer and market research, incorporation costs, robust intellectual property (IP) protection, or employee salaries for a startup.

³ Schaffer is also Executive Director of QB3, a biology institute that supports research, innovation, and entrepreneurship, and the Director of the Bakar BioEngineering Hub and Bakar Labs.

Without money for these activities, many academic discoveries never develop into viable products or services and instead fall into the “valley of death.” On one side of the valley, public sector entities, usually universities and governments, provide funding for the research necessary to make a discovery. On the other side, as a product or service grows closer to launch, investors step in. Between research and launch, though, lies the unpredictable valley where the product must be developed and where funding is often scarce. Though funding for translational research and federal Small Business Innovation Research (SBIR) grants can narrow the gap, they’re often insufficient to carry fledgling ideas all the way across the valley.

Universities seeking to provide more than translational research funding to academic startups must tread carefully. In the U.S., research universities are nonprofit organizations, and tax law restricts how nonprofits can support for-profit entities, including early-stage startups. Violating these laws could cost a university its tax-exempt status, a risk universities aren’t willing to take.

Faculty incentives can also create hurdles to academic startup formation. Faculty advance by publishing peer-reviewed journal articles, not by building products or services with real-world applications. They also often work long hours just to keep up with teaching and research responsibilities, leaving little to no time for entrepreneurship. Moreover, faculty members often have little experience pitching to investors or setting up companies.

In addition, building a company, even one based on an extraordinary scientific discovery, requires collaboration among multiple people with different skillsets. Universities, on the other hand, are organized by field of study. Business experts, scientists, engineers, and lawyers work and study in separate departments housed in different buildings and may rarely, if ever, cross paths.

Innovation and Entrepreneurship at UC Berkeley and the UC System

Most universities can and do support innovation and entrepreneurship to varying degrees, and UC Berkeley and UC system administrators have recently examined what that support should look like.

In 2018, the UC Berkeley Executive Vice Chancellor and Provost commissioned a report to assess technology licensing, the campus climate for entrepreneurship, and the state of student entrepreneurship.⁴ Schaffer was lead author on the report, *Entrepreneurship at UC Berkeley*, which states that translating knowledge into innovative products “amplifies the university’s societal benefit, and can thus be viewed as a natural extension of our research mission.” Furthermore, revenue from entrepreneurship can generate “new and sustainable revenue streams” that would help fund the public university.

The report also compared UC Berkeley to a small group of other universities along multiple dimensions and offered recommendations for how UC Berkeley could better encourage entrepreneurship. Three of the recommendations stand out: creating an office dedicated to entrepreneurship, having that office appoint a leader for entrepreneurship at the level of Associate Vice Chancellor, and suggesting that entrepreneurship be considered in tenure and promotion decisions in the same way that textbook writing or society service is.

Action on the first two recommendations quickly followed. By 2020, UC Berkeley had added an Innovation & Entrepreneurship team to the Office of the Vice Chancellor for Research and hired as its leader Richard Lyons, former dean of Berkeley Haas. Lyons became UC Berkeley’s first

⁴ The full report is available at: https://vcresearch.berkeley.edu/sites/default/files/2018-08/Entrepreneurship_at_Berkeley.pdf

Associate Vice Chancellor for Innovation & Entrepreneurship and Chief Innovation & Entrepreneurship Officer.⁵

Support for Innovation and Entrepreneurship at the UC Systemwide Level

Between 2019 and 2021, the Regents Working Group on Innovation Transfer and Entrepreneurship reviewed how the UC system of campuses supported entrepreneurship and innovation along seven dimensions, including funding. In many ways, the group’s high-level recommendations aligned with those of the 2018 UC Berkeley report. (See **Exhibit 1**.)

The UC Board of Regents soon codified many of the Working Group’s recommendations, including the mission statement shown in Exhibit 1, in a new policy on innovation transfer and entrepreneurship published in May 2021.⁶

Eleven months later, the UC Office of the President sent a letter to campus administrators addressing the issue of tenure. The letter asks administrators to work with their faculty to “credit less-traditional activities as well as basic research in the review process” for appointment, merit review, promotion, and tenure. The letter provides 15 examples of these activities, including “creation and contributions to start-up companies or services” and “commercialization and impact of research and other scholarly activities.”⁷

Proliferating Entrepreneurship Resources

For more than two decades, aspiring business founders at UC Berkeley have had access to a range of innovation and entrepreneurship resources, from academic programs to research-and-development support to startup competitions.

And those resources have multiplied quickly. Indeed, the 2018 Entrepreneurship at UC Berkeley report noted, in the section on the state of student entrepreneurship, that “student entrepreneurs uniformly found the ecosystem [of available resources] to be disorganized and time-consuming to map and filter for relevance. Students described being ‘intimidated’ by all the choices, ‘stumbling’ into relevant programs, and being ‘unaware’ of program deadlines until it is too late.”

Since the report’s publication, more resources have sprung up, resulting in a diverse and potentially overwhelming ecosystem of options. (See **Exhibit 2**.)

A Unique Solution to the Startup Funding Problem

More than 30 of the UC Berkeley entrepreneurship resources provide funding, and five of those are what’s known as shared-carry funds (called “shared-return funds” in **Exhibit 2**)—a type of venture capital fund that few, if any, other universities have set up.

Money comes from institutional investors, including other venture funds, and some accredited investors. Investments go to for-profit startups, and those startups can use the money for anything the business needs. No rules require the money to go only to translational research.

⁵ View the UC Berkeley Vice Chancellor for Research organizational chart at <https://vcresearch.berkeley.edu/about-us/organizational-chart>

⁶ Regents Policy 5105: Policy on Innovation Transfer & Entrepreneurship was approved on May 13, 2021. <https://regents.universityofcalifornia.edu/governance/policies/5105.html>

⁷ Recognizing Innovation Transfer and Entrepreneurship in the Academic Personnel Process, https://iande.berkeley.edu/sites/default/files/recognizing_innovation_transfer_and_entrepreneurship_in_the_academic_personnel_process.pdf

The funds operate in virtually the same way as other venture capital funds. The general partner receives 20 percent of the carry, or profits, with the balance going to the limited partners. The key difference is that the general partners then donate half of their carry to UC Berkeley.⁸

Some of the funds support only founders affiliated with UC Berkeley. Some support founders affiliated with any UC campus, and one, the Berkeley SkyDeck Fund, invests in companies that go through the Berkeley SkyDeck program.⁹ Investment from these shared-carry funds has helped UC Berkeley startups traverse the valley of death, but other challenges remain.

Creation of the LSEC Venture Grant Program

The wide range of UC Berkeley entrepreneurship resources resolved some of these challenges and has supported the formation of many startups. However, the range of resources also become a hurdle: many would-be founders are unsure where to start or how to navigate all the options, and there is not one best path through the ecosystem, as evidenced by the various approaches taken by other successful Berkeley startups. (See **Exhibit 3.**) As a result, would-be founders got stuck in an endless stage of planning.

To address this issue, UC Berkeley founded the Life Sciences Entrepreneurship Center (LSEC) in June 2021 to “foster life sciences entrepreneurship by leveraging, coordinating, and building upon existing campus resources.”¹⁰ Lyons serves as LSEC’s faculty director, and Darren Cooke as executive director, bringing his experience as an engineer, patent attorney, investor, and founder of the Bio Track at Berkeley SkyDeck to the role.

In LSEC’s first few months, Cooke conducted several hundred customer discovery interviews with multiple stakeholder groups, including startup founders, UC Berkeley faculty, venture capitalists, and graduate students. He had no set script; instead, he asked open-ended questions designed to help him understand market needs in the academic entrepreneurship space. He discovered that students were interested in entrepreneurship but confused about where to start, an echo of the 2018 Entrepreneurship at UC Berkeley report. He also learned that both would-be founders and outside experts thought educational programming on business-focused topics, such as IP, business models, and pitching, would be very valuable. (See **Exhibit 4.**)

By mid 2022, LSEC had built programs to fill gaps in the existing innovation and entrepreneurship ecosystem, including I-Corps @ LSEC and Bio Startup Speed Teaming. The first teaches aspiring life sciences founders an industry-standard method to test an idea for market viability. The second introduces scientists to business experts through ten-minute meetings, enabling at scale the kind of connections Kannuswamy sought out through Schaffer.

As he was building LSEC, Cooke also met with life sciences faculty members interested in starting a business. The interactions frequently played out in a similar way. Cooke would show the faculty member a webpage describing entrepreneurship resources. The faculty member would say, “Oh, that’s a lot. That’s confusing. Should I apply to Berkeley SkyDeck?” Cooke would respond, “Yes, definitely.” The faculty member would ask, “Should I do the I-Corps program?” Cooke would respond, “Yes, definitely.” The conversation would continue like that until they’d covered several

⁸ Limited partners in the Berkeley Frontier Fund also pledge 25% of their profits to UC Berkeley.

⁹ Berkeley SkyDeck requires “a team member (founder, employee, advisor) affiliated with UC Berkeley, any UC campus, or Berkeley Lab (Lawrence Berkeley National Lab). An affiliate is a student, alumni, faculty, staff, postdoc researcher, or visiting scholar. Founders who are foreign nationals without any of these affiliations are eligible to apply through the Global Founders Program.”
<https://skydeck.berkeley.edu/apply/>

¹⁰ LSEC Venture Grant Program, <https://lsec.berkeley.edu/venture-grant>

resources. Soon enough, the faculty member would have their lab conduct more experiments rather than progress towards founding a business.

“That was the inspiration for me for the Venture Grant program,” Cooke said. “I thought, what if we just stitched the resources together so that there’s a clearer path?”

Building the path was relatively easy. Of the vast number of campus resources, a few logically fit together to support company formation. Successful applicants to the LSEC Venture Grant program would, in the order they chose and as relevant to the company:

- Receive funding: a \$100,000 grant for translational research and up to \$200,000 investment from the Berkeley SkyDeck Fund that wasn’t restricted to translational research.
- Be admitted to the highly competitive Berkeley SkyDeck accelerator and participate in the culminating demo day to pitch over 1,000 investors.
- Participate in QB3’s SBIR grant-writing workshop, opening doors to additional funding.¹¹
- Participate in the I-Corps @ LSEC program to conduct customer research.
- Participate in Bio Startup Speed Teaming to meet potential team members.
- Get access to community events at Bakar Labs, an on-campus incubator for promising bioscience startups.
- Optionally participate in the IP Law Practicum course to help understand the company’s IP.
- Optionally sponsor a project in Lean Transfer, a course in the Berkeley Haas MBA program to teach students how to assess the commercialization potential of a technology.

(See **Exhibit 4** for a more detailed description of the Venture Grant program components and eligibility requirements.)

Cooke also hoped that companies formed through the Venture Grant program would ultimately become tenants at Bakar Labs, part of the Bakar BioEnginuity Hub run by Schaffer.

¹¹ The SBIR grant is offered by the U.S. Small Business Administration.

End of Preview

For more information, and to access the full case study,
please visit our website:

cases.haas.berkeley.edu

Exhibit 1

From the University of California Regents Working Group on Innovation Transfer and Entrepreneurship May 2021 report: *From Discovery to Societal Impact: A Roadmap to Unleashing UC Innovation and Entrepreneurship*.

From Key Findings: Recommendations for the University

Based on its inquiry, the Working Group recommends broad-based reforms, increased investment and/or systemic modernization in the following seven areas which are discussed in the body of the report:

- Governance
- Patent Tracking System (i.e., information technology infrastructure)
- Funding
- Policy
- Culture/Reputation
- Enforcement
- Performance Metrics¹²

The Working Group urges the adoption of the following mission statement to guide the University's innovation transfer and entrepreneurship programs at both the campus and systemwide levels.

- Promote the translation of UC's discoveries into useful products, services, and innovations that not only provide value to individuals and society, but also endeavor to uplift the human condition.
- Inspire the passion of our faculty and student inventors, as well as provide the problem-solving and collaborative support necessary to translate those ideas into real-world solutions having societal benefit; and
- Pursue fair value for our intellectual property so UC can continue to grow its excellence in scholarship, research, and global impact.¹³



Source: From Discovery to Societal Impact: A Roadmap to Unleashing UC Innovation and Entrepreneurship, <https://regents.universityofcalifornia.edu/regmeet/may21/g1attach.pdf>


¹² From Discovery to Societal Impact: A Roadmap to Unleashing UC Innovation and Entrepreneurship, <https://regents.universityofcalifornia.edu/regmeet/may21/g1attach.pdf>, page 9.

¹³ *Ibid*

Exhibit 2 UC Berkeley I&E Ecosystem

UC Berkeley I&E Ecosystem: 2000

<p>ACADEMIC PROGRAMS</p> 	
<p>NEW PRODUCT R&D SUPPORT</p> 	
<p>PRODUCT/MARKET FIT SUPPORT</p>	
<p>STARTUP SUPPORT</p>	<p>HAAS BUSINESS PLAN COMPETITION</p> 
<p>FUNDING SUPPORT</p>	
<p>SHARED CARRY FUNDS</p>	<p>LEGAL SUPPORT</p>
<p>ENTREPRENEURSHIP & IP SUPPORT</p> <p style="text-align: center;">UC BERKELEY OFFICE OF TECHNOLOGY LICENSING</p> 	<p>RECRUITING SUPPORT</p> 



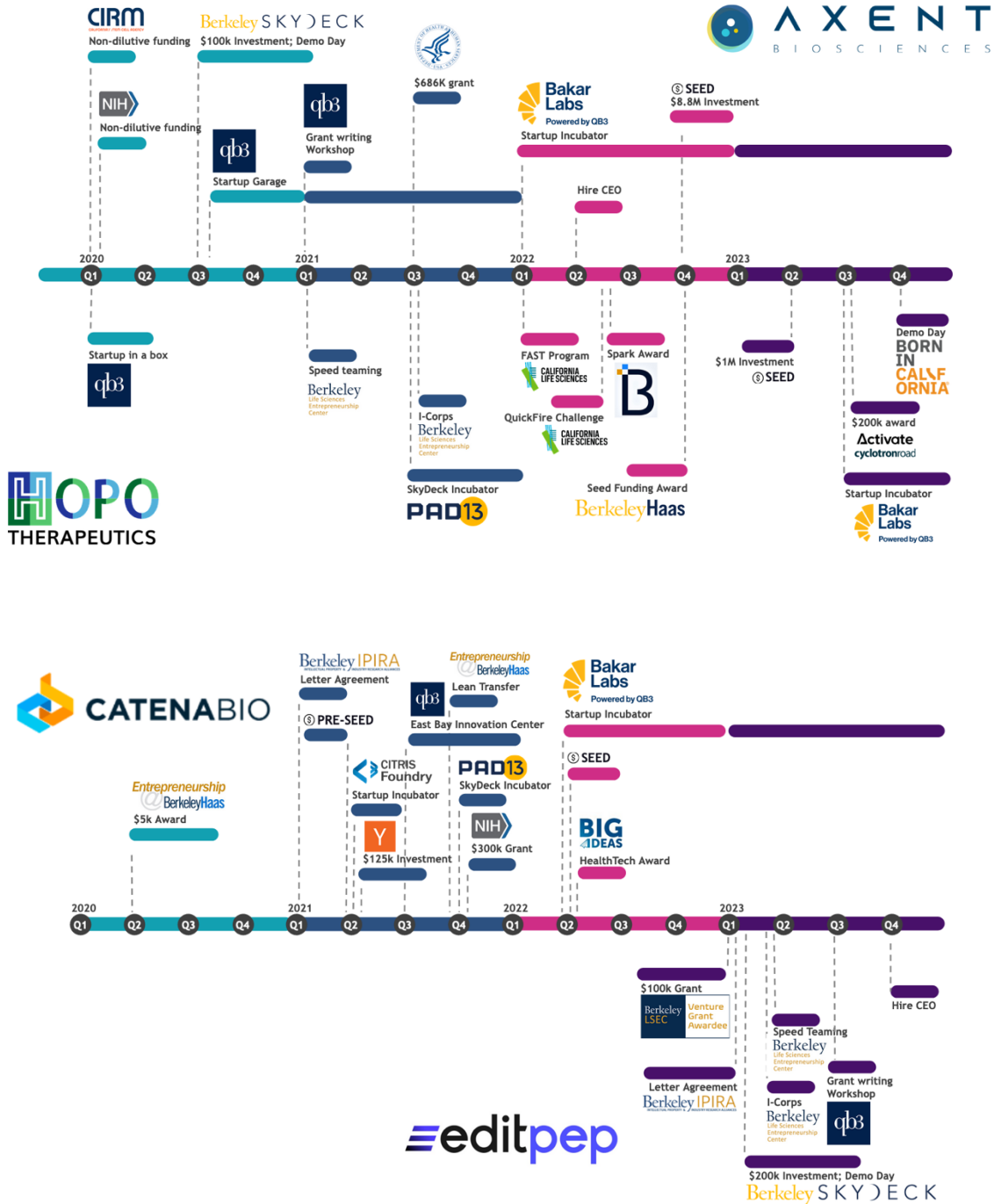
UC Berkeley I&E Ecosystem: Today

<p>ACADEMIC PROGRAMS</p> 	<p>NEW PRODUCT R&D SUPPORT</p> 
<p>PRODUCT/MARKET FIT SUPPORT</p>	
<p>STARTUP SUPPORT</p> 	<p>FUNDING SUPPORT</p> 
<p>SHARED RETURN FUNDS</p> 	<p>LEGAL SUPPORT</p> 
<p>ENTREPRENEURSHIP & IP SUPPORT</p> 	<p>RECRUITING SUPPORT</p> 



Source: Case Authors

Exhibit 3 Timeline showing how Editpep proceeded through the parts of the LSEC Venture Grant program, as compared with other successful academic biotech startups from UC Berkeley



Source: Case Authors

Exhibit 4 LSEC Customer Discovery Interview Findings

Pain Points

- Interest in entrepreneurship from students but confusion about where and how to start.
- Would-be founders and new startups want low-lift educational programming, and outsiders agree they need it to avoid mistakes (team, IP, business model, pitching).
- Need for science-business-engineering matchmaking to form complete team.
- Would-be founders most want to learn from other founders who are one or two steps ahead.

Other Themes

- Desire for longitudinal advisor relationship, not just one-hour meeting.
- Academic founders must understand difference in R&D for paper vs. to build a company.
- Recent successful founders went out of their way to find resources.
- “Entrepreneurship” and “networking” may be scary terms to some in science.

Source: Case Authors