

The Regents of the University of California

SPECIAL COMMITTEE ON INNOVATION TRANSFER AND ENTREPRENEURSHIP

August 28, 2023

The Special Committee on Innovation Transfer and Entrepreneurship met on the above date at the University Center, Santa Cruz campus, and by teleconference.

Members present: Regents Hernandez, Leib, and Matosantos; Chancellors Christ, Hawgood, Khosla, and Muñoz; and Advisory members Green, Ku, Pouchot, and Timmons

In attendance: Regents Ellis and Tesfai, Secretary and Chief of Staff Lyall, Deputy General Counsel Wright, Provost Newman, Vice President Maldonado, Chancellor Larive, Faculty Representative Steintrager, Staff Advisor Mackness, and Regents Analyst Sheridan

The meeting convened at 9:35 a.m. with Regent Hernandez presiding.

1. PUBLIC COMMENT

Regent Hernandez thanked Chancellor Larive and UC Santa Cruz staff for hosting the meeting. He explained that the public comment period permitted members of the public an opportunity to address University-related matters. The following persons addressed the Special Committee concerning the items noted.

- A. Ed Green, a professor of biomolecular engineering at UC Santa Cruz and faculty director of the California Institute for Quantitative Biosciences at UCSC, stated that he founded three companies from technology developed at and licensed from UC Santa Cruz. This has created internship and learning opportunities for students, as well as job opportunities for alumni living in Santa Cruz.
- B. Cameron Pye, co-founder and Chief Executive Officer of Unnatural Products and a former UCSC graduate student, noted that his company employs 24 employees, half of whom are UCSC alumni. The company also established an internship program for students. He stated that the campus has significantly built up its innovation ecosystem since he founded his company.
- C. UCLA Professor Emeritus Daniel Mitchell urged administrators at the UC Office of the President to contact insurers and instruct them not to cancel the health insurance of surviving spouses of UC retirees, who are eligible for continued health insurance. He stated that this is an error and contrary to UC policy.

2. INNOVATION AND ENTREPRENEURSHIP AT UC SANTA CRUZ

[Background material was provided to the Special Committee in advance of the meeting,

and a copy is on file in the Office of the Secretary and Chief of Staff.]

Chancellor Larive described UC Santa Cruz as a “networked university” comprising a residential campus, a coastal science campus, a Silicon Valley campus, and three affiliated centers: Westside Research Park (home to the Genomics Institute), Scotts Valley Center (which houses UCSC Extension and staff functions), and the Monterey Bay Education, Science, and Technology Center, or MBEST (a technology and economic development hub for the Monterey Bay Region).

She was proud that UCSC is one of five members of the Association of American Universities designated as both a Hispanic-Serving Institution and an Asian American and Native American Pacific Islander-Serving Institution. She was proud that UCSC increased research funding by 63 percent over the past five years, reaching over \$200 million, last year. The campus manages over 350 patents.

Chancellor Larive outlined the campus’ history of pioneering research advances, including the first sequencing of the human genome in 2000. She noted that in the prior week Oxford Nanopore Technologies, based on nanopore sequencing technology licensed from Santa Cruz, announced that it sequenced a complete human genome for the first time.

In 2021, UCSC established the Innovation and Business Engagement Hub to advance innovation and entrepreneurship programs and engage in innovation-led economic development initiatives. The Hub acts as the point of entry for industry partners, investors, and entrepreneurs to connect with the campus’ discoveries. She also described the structure of the campus units that engage in innovation transfer and entrepreneurship.

Chancellor Larive reported that the Chancellor’s Innovation Impact Awards Program was held for the first time this year. It recognizes and celebrates contributions to innovations that have catalyzed transformative change and have had societal impact. Innovation Catalyst Grants provide funding to bridge resource gaps and provide training, mentorship, and support to researchers and entrepreneurs.

Chancellor Larive highlighted other innovation and entrepreneurship programs, including: (1) the Center for Innovation and Entrepreneurial Development (CIED), which empowers student entrepreneurs by providing coursework, boot camps, pitch competitions, and internships; (2) the Center for Information Technology Research in the Interest of Society (CITRIS), which supports early-stage research projects; and (3) the California Institute for Quantitative Biosciences (QB3), a hub for innovation and entrepreneurship in the life sciences that contributes to biotechnology workforce development through undergraduate internships and graduate student fellowships.

Chancellor Larive expressed appreciation for the report of the Regents Working Group and the related Special Committee’s efforts for providing a framework to help UCSC advance innovation and entrepreneurship with limited resources. In particular, the recommendation to augment the campus’ budget will enable UCSC to focus its efforts and build its innovation infrastructure so that it can hire staff to support and to perform additional

functions over time. In the meantime, the partially decentralized operating model will be beneficial to small campuses, allowing them to continue to use Office of the President (UCOP) support and specialized services. In addition, a replacement intellectual property management system will utilize staff time more effectively by eliminating inefficiencies created by outdated centralized software tools. Finally, she stated that the recommendations to build a campus culture that embraces innovation and entrepreneurship, including revising promotion and tenure guidelines, is helpful and dovetails with existing campus efforts.

Chancellor Larive explained that UCSC's long term vision is to drive transformative change and societal impact by leveraging its strengths, including social justice and community engagement. The campus is particularly well-positioned to accelerate activity in two areas: climate action and advanced aviation. She highlighted the work of the Center for Coastal Climate Resilience which advances innovative solutions for building coastal resilience, and Hacking 4 Oceans, an entrepreneurship and coastal conservation course focused on using lean design and innovation methodologies to advance solutions to key ocean problems.

UCSC is also pursuing cutting-edge innovation in the area of advanced air mobility at UC MBEST which is adjacent to Federal Aviation Administration (FAA)-controlled land at the Marina Municipal Airport. She stated that the advanced air mobility industry is poised to disrupt the world of aviation with all-electric, vertical take-off and landing (eVTOL) passenger and cargo aircraft. These new aircraft will reduce carbon emissions while enabling more efficient aerial transport of people and cargo.

Faculty Representative Steintrager asked how UCSC is incorporating humanities and social sciences into its innovation and entrepreneurship (I&E) efforts. Chancellor Larive responded that innovation takes place across all disciplines. Assistant Vice Chancellor for Innovation and Business Engagement Ryan Sharp added that the campus intentionally does not equate innovation with invention. For instance, the nomination process for the Chancellor's Innovation Impact awards was open to the entire campus community and the selection committee included members from all divisions on campus.

Regent Leib asked what else could be done to help the campus achieve its goals. Chancellor Larive responded that the Regents have brought attention to this area, which has been extremely valuable. She noted that the campus will benefit from continued central support for legal services, as well as from the replacement to the Patent Tracking System. Vice Chancellor for Research John MacMillan added that the launch of UCSC's own proof-of-concept fund was driven by the Regents' report and that additional funding would be helpful, as the campus does not have enough funding to invest in all worthy projects. Regent Leib pledged that the Regents would continue to advocate for State monies for a proof-of-concept fund to be matched by the campuses.

3. **INCLUSIVE INNOVATION EQUITABLE ENTREPRENEURSHIP UPDATE**

[Background material was provided to the Special Committee in advance of the meeting,

and a copy is on file in the Office of the Secretary and Chief of Staff.]

Provost Newman introduced Damon Tull, Principal Investigator of the Inclusive Innovation Equitable Entrepreneurship (I2E2) initiative. Mr. Tull said that the aim of I2E2 is to create a more inclusive and equitable innovation and entrepreneurship (I&E) system to support state and national needs. He stated that the exclusion of women and racial and ethnic minorities from access to entrepreneurial capital has led to the loss of an estimated \$16 trillion in U.S. gross domestic product over the past 20 years. He argued that these disparities threaten U.S. global competitiveness as well as its national security. In 2021, of the \$344 billion in venture capital investments, only two percent went to female founders, 1.3 percent went to black founders, and 2.3 percent went to Latino/a founders. Given California's prominence in innovation, if the state had eliminated racial bias in access to venture capital 20 years ago, it would be third largest economy in the world instead of the fifth largest economy.

Mr. Tull remarked that from 2012 to 2022, 6,500 UC alumni founded 5,300 venture capital-backed companies that raised \$204 billion; this represents 14 percent of all venture capital invested during that ten-year timeframe. He asserted that because University of California alumni play a substantial role in U.S. I&E, the University has a responsibility to understand who contributes to innovation.

To this end, I2E2 aims to understand rates of participation, capital flows, and the campus climate and experiences of its students, faculty, and researchers. He explained that the data that I2E2 needs to do so was fragmented and spread across numerous sources at the University. However, recently UC Davis developed technology to uncover the demographic breakdown of UC I&E contributors. This method identified demographic data for 85 percent of all UC inventors and principal investigators.

Mr. Tull provided an update on I2E2's achievements. Since he briefed the Special Committee in January 2023, I2E2 received 97 percent of formal I&E education data from UC campuses; administered and analyzed UC-wide surveys of innovators, funders, and UC technology transfer officers; and submitted preliminary data for external review. In the coming months, I2E2 will conduct a second round of external reviews, finalize its recommendations and reports, undergo a review by a University Institutional Review Board, deliver its report to Vice President for Research and Innovation Maldonado, and develop supplemental reports on each campus to each campus' chancellor.

The reports will provide metrics and a baseline description of the demographics of participants in UC's I&E ecosystem; an explanatory model for understanding what variables need to be adjusted to enhance I&E participation by those groups that have been historically excluded; evidence-based recommendations; and suggestions for interventions to engage non-participants.

Regent Hernandez opined that campus-by-campus data would be more valuable than a general summary. Mr. Tull responded that the data show profound disparities between the campuses. However, it is reported in the aggregate due to Institutional Review Board

requirements, and security and data management concerns. He added that the explanatory model will help the University to understand the situation in more detail and that the goal of I2E2 is to “grow” the pie and divide it well.

Staff Advisor Mackness asked for a preview of the initiative’s recommendations. Mr. Tull responded that there are 1,700 underrepresented faculty at UC who in the disciplines that contribute 80 percent of all inventions, but that only 200 of those faculty participate in I&E activities. However, he noted the caveat that UC only collects demographic data on the two primary principal investigators, not all members of the team.

Advisor Green stated that the ultimate measure of success is whether more funding goes to underrepresented researchers and asked how UC can engage with the venture capital community to foster the inclusion of diverse researchers. Mr. Tull mentioned that he has several ideas to promote investment in diverse researchers’ projects that UC’s Chief Investment Officer should consider.

Regent Matosantos asked what UC’s I&E output might have been absent structural biases. Mr. Tull responded that in 2021, UC research activity was \$7.4 billion. By broadening participation in research alone, it could have been between \$9 billion and \$10 billion. He commented that UC could have an immediate impact on creating more equitable participation by broadening opportunities for graduate students.

Provost Newman pointed out that the percentage of black graduates in science, technology, engineering, and mathematics programs remained flat at nine percent from 2001 to 2016 and declined from five percent to four percent in engineering and from seven percent to four percent in mathematics. She emphasized that unless the University can recruit diverse students into the fields that generate I&E, the numbers will not improve.

4. **INNOVATION AND ENTREPRENEURSHIP IN THE HUMANITIES AND SOCIAL SCIENCES: A ROADMAP FOR TRANSFORMING LIBRARY OPERATIONS**

[Background material was provided to the Special Committee in advance of the meeting, and a copy is on file in the Office of the Secretary and Chief of Staff.]

Richard Andrews, former Associate Director of the Center for New Music and Audio Technologies at UC Berkeley, and Todd Grappone, the Associate University Librarian for Digital Initiatives and Information Technology at UCLA, discussed a project aimed at reinventing the library for the 21st century. The initiative is rooted in the Special Committee’s inclusive approach to innovation and entrepreneurship, which includes the arts, humanities, and social sciences.

Mr. Grappone stated that at the request of the Special Committee, he and his colleagues developed a roadmap for transforming libraries through the use of artificial intelligence (AI) and machine learning. Such tools can be used to enhance the use of the library’s collections by developing new ways of accessing digital collections, developing collections

of data, and coordinating with campus libraries on initiatives to benefit the libraries systemwide. While other major university libraries are already pursuing this, UC is well-positioned to surpass them in harnessing these tools to enhance learning because it has one of the largest collections on the planet.

He noted that if UC does not implement the proposed UC Library AI Program, the opportunity will be lost to leverage an emerging and influential technology that can help make libraries operations and workflows more efficient. Moreover, it will limit UC scholars from using its data collections for AI research and development.

The roadmap proposes the creation of AI tools and workflows to support content and systems; create new tools for content to be curated, published, and stewarded more efficiently; develop tools and services to facilitate accessing the collections; and create more research opportunities.

The proposed timeline for this project is from January 1, 2024 to December 31, 2026. In the first two years, the project team would develop AI-enabled tools and workflows, and in the final year, it would work closely with the Council of University Librarians to incorporate AI-supported tools systemwide and to pursue licensing agreements to offer UC-developed innovations to external clients.

Regent Ellis inquired about the contradiction between being a public institution committed to open educational resources and developing tools and techniques that generate revenue. Mr. Andrews responded that the project's ambition is to freely distribute open-source tools and services that can benefit society in parallel with developing certain tools and techniques that could be licensed.

Provost Newman asked about the effect that AI would have on the library staff, and how they would acquire the skills needed in the future. Mr. Grappone responded that he did not think that AI would replace librarians. Rather, future librarians would be trained to use AI to help students find resources.

Chancellor Khosla asked how this project would be funded without new resources. He noted that library budgets are allocated to staff, collections, and real estate. Mr. Andrews responded that he and his colleagues would work with the Council of University Librarians to identify internal and external sources of funding. Mr. Grappone added that he hoped this discussion would generate excitement about the project. Chancellor Khosla observed that developing AI tools requires a large investment and that journal publishers have the ability to invest in such content. He asked how University libraries with smaller budgets can compete. Mr. Grappone stated that the proposed project is narrower in focus. Chancellor Khosla added that the various campuses' libraries could focus on different elements of the project to collectively enhance the University library.

5. SPEAKER SERIES: DR. SRI KURNIAWAN

[Background material was provided to the Special Committee in advance of the meeting,

and a copy is on file in the Office of the Secretary and Chief of Staff.]

Chancellor Larive introduced Professor Sri Kurniawan, a founding member of the Computational Media department and the ASSIST (Assistive Sociotechnical Solutions for Individuals with Special Needs via Technology) Laboratory at UC Santa Cruz. Her research is cutting-edge, leverages UCSC's tradition of social justice, and has societal impact.

Ms. Kurniawan said that she creates virtual reality (VR) games for people with special needs. She provided a summary of some of the work that students in her laboratory have created, including a multisensory VR game for fire preparedness, a game providing sexual and relationship education and safety for people with developmental disabilities, a VR physical therapy game that helps stroke survivors regain motor skills, and VR games that teach socioemotional skills for people with autistic spectrum disorder and developmental disabilities.

Regent Tesfai commented favorably on Ms. Kurniawan's emphasis on mentorship and crediting students from undergraduates through postdoctoral fellows for their work.

Chancellor Muñoz remarked that "gamification" resonates with youth and is an excellent way to address myriad issues. He could see applications to address stigma for English as a Second Language students. He particularly appreciated the cultural competency demonstrated in the games.

Chancellor Larive observed that *U.S. News and World Report* ranked UCSC's gaming program fifth in the nation.

Regent Ellis appreciated the emphasis on inclusion and remarked on other potential applications. He posited that VR, augmented reality, AI, and Large Learning Models and other forms of machine learning will revolutionize education.

6. GLOBAL UPDATE ON REPORT RECOMMENDATIONS

[Background material was provided to the Special Committee in advance of the meeting, and a copy is on file in the Office of the Secretary and Chief of Staff.]

Provost Newman reported progress on implementing the recommendations of the Working Group's report. She referred to Attachment 1 in the item, a chart summarizing progress.

She outlined a three-part process to solicit and vet a future Intellectual Property Management System (IPMS) vendor to replace the Patent Tracking System (PTS). The Office of the President (UCOP) prepared a Request for Information (RFI) to which seven vendors responded. These vendors were invited to respond to a subsequent Request for Proposals, which incorporated information gathered from the RFI. In June, an evaluation team reviewed and scored the proposals. UCOP is negotiating with the highest scoring vendor and anticipates entering into a contract after review by UC Legal.

She reported that once an IPMS is procured, each campus will enter into an agreement regarding which services will be provided by UCOP. In partnership with the campuses, UCOP will refine a plan to pay for the new system, including debt service related to the acquisition of the new platform, operating costs to run the new system, and retirement costs for the legacy system.

Executive Director of Research, Policy, and Coordination Deborah Motton provided an overview of UCOP's efforts to revise and update systemwide policies related to innovation and entrepreneurship (I&E). The policy governing the management of equity derived from University intellectual property (IP) was revised to permit campus management of equity. The policy no longer applies to those campuses that accepted a delegation of authority. To date, the Berkeley and San Diego campuses have accepted the delegation and UCOP anticipates that two additional campuses will accept the delegation in the coming months.

In addition, Ms. Motton reported that the amendments to the Presidential patent policy, which had not been revised since 1997, are undergoing systemwide review with the expectation that a final, revised policy will be issued by January 2024.

Finally, Ms. Motton addressed guidance on conflicts of interest in licensing. New, clear and concise guidance was issued in April 2023. UCOP continues to review existing conflict of interest, conflict of commitment, and outside professional activities policies in areas other than licensing with the goal of issuing a comprehensive systemwide policy in calendar year 2024.

Provost Newman invited Regent Leib to discuss the Regents' efforts to secure funding for a systemwide proof-of-concept fund and noted that the President's Entrepreneurship Network Council will work on this initiative. Chair Leib emphasized his belief in the importance of a systemwide fund that would be matched by the campuses to bridge the funding gap between research and the investment of private monies to bring a product or service to the marketplace. He suggested that the Merced, Riverside, and Santa Cruz campuses would particularly benefit from access to such funds and should be allocated a greater portion of any such funds. He stated that he and Regent Matosantos have been discussing possibilities with Provost Newman and hope to have a plan for pursuing funding by November. This is one of his priorities during his term as Chair of the Board.

Chancellor Muñoz reiterated that certain campuses would especially benefit from proof-of-concept funds. This investment would accelerate the growth of I&E activity at these campuses to a level commensurate with other campuses.

7. **A CONCEPTUAL FRAMEWORK FOR DEFINING AND MEASURING THE VALUE OF UC'S INNOVATION AND ENTREPRENEURSHIP ENTERPRISE**

[Background material was provided to the Special Committee in advance of the meeting, and a copy is on file in the Office of the Secretary and Chief of Staff.]

Senior Advisor to the Regents Collin Wong-Martinusen reported on his efforts to expand how UC defines, measures, and conveys the success of UC innovation and entrepreneurship (I&E). In addition to reporting disclosures, patents, and revenue, the Working Group recommended assessing the economic and public impact of UC research, as well as developing diversity, equity and inclusion data that measures how well UC incorporates groups that have been historically marginalized into its innovation and entrepreneurship activities.

Mr. Wong-Martinusen noted that UC publishes an annual report summarizing its commercialization activity, comprised of measurements of transactional activity. While these are important indicators of productivity, they are not a compelling way to convey the value of UC I&E or to inspire stakeholders to support investment in UC research. He argued that while data validates, stories inspire. For example, thanks to groundbreaking research at UCLA on prostate cancer that led to a new pharmaceutical, many men will live longer lives.

In consultation with external advisors and Special Committee Chair Park, he recommended that UC should endeavor to provide context alongside transactional measurements of I&E productivity. To this end, UCOP should incorporate into its annual technology commercialization report storytelling and an “innovation spotlight.” UC would choose a theme to spotlight that has captured the public’s attention and highlight the University’s leadership role in creating solutions to problems that the public cares about. The annual report should also include diversity, equity and inclusion data on the participation of diverse populations in UC’s I&E activity. As noted in a prior presentation, there is an effort to collect such data and develop evidence-based recommendations for interventions to encourage engagement by non-participants.

In addition, he recommended that every five years, the University commission an economic analysis measuring job creation, tax revenues, regional economic development in the communities, philanthropic giving to UC attributable to I&E activity, and the impact of I&E on the recruitment and retention of faculty, postdoctoral fellows, and students. Cost projections for these analyses are included in the item to provide the Special Committee with a rough estimate of the necessary level of investment. The ultimate cost would rely on the scope of work and the extent to which the necessary data is readily available or must be procured.

Advisor Ku highlighted the most important lessons of the Special Committee’s work. She opined that the most important measurement of I&E productivity is the number of licenses signed. While licensing revenue fluctuates, more licenses create greater opportunities for revenue. She also held that it is important for the University to foster a reputation that it is receptive to licensing and is a good business partner. She asserted that it is vital to create an entrepreneurial ecosystem and offered UC San Diego as an example of a campus that successfully built an innovation culture and as a result, became a regional powerhouse of entrepreneurial activity. She stated that making proof-of-concept funds available to entrepreneurs is essential and noted that Stanford University operates several smaller funds focused on innovation in different areas. She also noted that while it is difficult to license

discoveries in the physical sciences, the Biden administration is investing in this area. UC should prepare itself for this influx of research dollars. Finally, she reiterated that storytelling is essential so that the public understands the impact of UC research.

8. **UPDATE ON ENTREPRENEURSHIP INITIATIVES**

[Background material was provided to the Special Committee in advance of the meeting, and a copy is on file in the Office of the Secretary and Chief of Staff.]

Provost Newman stated that President Drake appointed 15 members to the newly created President's Entrepreneurship Network Council. The Council aims to strengthen innovation and entrepreneurship (I&E) at the campuses and its work and agenda will be driven by the campuses.

UC Berkeley Associate Vice Chancellor for Innovation and Entrepreneurship and Chair of the President's Entrepreneurship Network Council Richard Lyons described plans for the Council. The Council will determine its three priorities at its first meeting this week and will create project teams to pursue each priority. The broader aim is to measurably advance its goals in the next two years. He remarked that its membership represents diverse fields and campuses and will work in parallel with faculty.

Provost Newman announced that Governor Newsom proposed investing \$2 million in a UC pilot program that will provide support to non-U.S. born entrepreneurs, including faculty, graduate students, and recent alumni. She will provide an update on this line item in the proposed State budget at a future Regents meeting.

Regent Leib offered remarks to conclude the final meeting of the Special Committee. He was pleased that nine of the Working Group's 14 recommendations have either been implemented or are well on their way to implementation.

He thanked the members of the Working Group and Special Committee, and particularly the external advisors, for sharing their deep knowledge and expertise with the Regents. He also thanked the many staff members who worked tirelessly to respond to the recommendations. Finally, he expressed gratitude to Provost Newman for her partnership in bringing the recommendations to fruition and to both Provost Newman and Special Committee Chair Park for their outstanding leadership.

The meeting adjourned at 2:25 p.m.

Attest:

Secretary and Chief of Staff