

Working Group Report—Research and Scholarly Distinction

A. Mission Overview

UCR, at its core, is a research university. It aspires to be among the world leaders in research and scholarship and has, in many respects, already achieved this status. Moving forward we must build on our successes while capitalizing on the unique opportunities that extend from our rich history of diversity and inclusion. We must broaden our reach and build strategically from our strengths, while at the same time pursuing new frontiers defined equally by societal responsibility and fundamental curiosity. Our dedication to research and scholarship reflect our shared values and our overarching commitment to excellence in all aspects of the university experience.

Our teaching and mentoring flow naturally from our research and scholarship and support each other in partnership. A university education must nurture critical thinking, and research and scholarship embody critical inquiry. Students at a research university must learn from those already committed to producing knowledge, while the students enrich the community of scholars through their vast skills and potentials along with the great diversity of experiences, ambitions, and responsibilities they bring to the mix. UCR stands at the cusp of greatness and will cross over that threshold through its rich history and bold visions in research and scholarship. The university must allocate resources and adopt strategies to ensure that we can continue to surround our students with top-tier scholars, while extending even further into the global community through our scholarly impact.

Research and scholarship are our responsibility to the daily and long-term pulse of our communities. Research in the natural and social sciences at UCR informs public policy by collecting and interpreting data that then shape a community's ability to solve problems and address needs—from the environment, to creative economies, to health and wellbeing. By investigating and rethinking diverse human experiences, scholarship in the arts and humanities at UCR informs community self-understandings and abilities to think critically and creatively about the past, present, and future. Research and scholarship in the sciences and engineering improve our quality of life and understanding and lead us toward a healthier planet with sustainable development. Together, all facets of our research afford us the opportunity to ask the biggest questions about who we are, where we came from, what lies ahead, and what else is out there—ever testing the imagination to seek the new and remarkable.

The committee recognizes the many existing and unique areas of excellence in RSD at UCR and the excellence of faculty and students in RSD. For UCR to rise to even higher levels, we must remain vigilant and ambitious, even in challenging times, and remember our unique strengths and our special place in the global community. What follows is a roadmap to help pave this path, outlining steps that come from working and dreaming 'within the trenches'—spanning fundamental needs that range from essential, low-hanging fruit to

pie-in-the-sky opportunities that should always remain in our sights and ultimately in our reach.

B. Vision Statement

UCR will be a world leader in targeted areas of scholarly inquiry and will have an RSD profile that is commensurate with those of AAU institutions and the impact of a world class University.

C. Strategies, Actions, and Initiatives

(1) Identify selected areas of current and potential world-class, UCR-distinctive research for strategic investment.

We must recognize opportunities for University-wide research and scholarship around a set of critical societal challenges—as well as fundamental, curiosity-driven, and impactful endeavors—that UCR is particularly well positioned to address.

This path should build on existing and historical strengths while exploring new opportunities: e.g., air quality (pollution and dust); citrus research and plant sciences; genomics; entomology; novel climate and wildfire science; natural hazards; Earth system science; educational, health, and socioeconomic disparities; gender and racial disparities; as well as other challenges linked to the region and beyond, food security, space/planetary sciences, and energy frontiers.

- Capitalize on regional opportunities, such as proximity to NASA's Jet Propulsion Laboratory and the community of SoCal universities, region-specific challenges, etc.
- Choices should allow for adaptability as the market changes. Periodic reviews/updates and path adjustments will be essential.
- Targeted investment of this type will be controversial. Nevertheless, we cannot and should not grow equally in all areas. Rather, we can lead the world in some and eventually many fields.
- Balance targeted investments in applied research with an unyielding commitment to fundamental (basic) research.
- Seek new research and funding opportunities across disciplinary boundaries (more on this below). Identify emerging research targets—fundamental and applied: e.g., ageing, big data endeavors, wildfire science, NASA mission science, health disparities, social justice, and leadership in Salton Sea and other regional environmental challenges.

(2) Cultivate a community of UCR research and scholarship across campus rooted in our diversity.

We must address the challenges faced by underrepresented groups with swift, effective, and permanent change. Continue to embrace the diversity of our community as a resource

and help set the national and international standards for related opportunity, leadership, and impact.

(3) Capitalize on UCR's unique position 'on the edge.'

UCR is positioned along boundaries that offer challenges, opportunities, and responsibilities: **Geographic:** ocean vs. land, urban vs. rural, desert vs. mountain, desert vs. agriculture/developed, residential vs. commercial. Consider associated water rights, traffic patterns, climate and local environmental impacts, and educational and health issues including dust, among other key factors. **Socioeconomic:** wealthy vs. poor and associated racial and ethnic juxtapositions. **Geologic and geo-ecologic:** geohazards (proximal fault zones) and fire science (unique problems and strategies for mitigation defined at the interface between areas of high fire risk and centers of urban and residential development). **Political:** dramatic differences among juxtaposed and intermixed political ideologies (perhaps uniquely so in CA).

(4) Continue to develop the characteristics of an AAU institution in alignment with UCR's history, mission, and vision.

- Elevate and maintain a doctoral-to-undergraduate student ratio to a level consistent with this goal.
- Aspire to dramatically higher goals for external support, increasing foundation and large agency awards in particular (e.g., at the level of major NASA missions and national centers).
- Continue to hire outstanding faculty, including special opportunities that attract underrepresented groups and individuals drawn to our unique programs, facilities, historical strengths, and ambitious new directions.

(5) Double our percentage of graduate and professional students within the next ten years.

In growing these numbers, we should consider success in post-UCR placement among the different fields and departments and target investment accordingly—including market demands and opportunities. Our graduate student numbers are consistently much lower than those of AAU institutions. Increases will impact our global reach/profile, research productivity, and extramural funding. Emphasize Ph.D. programs in this growth but also embrace the value of Master's degrees as gateways to careers and Ph.D. programs.

(6) Facilitate interdisciplinary efforts.

Because the opportunities and problems in the world today are complex and multifaceted, UCR must be committed to interdisciplinary and cross-disciplinary collaborations—including those defined at the interfaces between the natural and social sciences and the humanities. We must explore and incentivize ways in which

interdisciplinary and cross-disciplinary projects and graduate programs can help grow and advance the University's research mission.

- Identify and breakdown the administrative, budgetary, policy, and logistical barriers that challenge interdisciplinary research at UCR.
- Specifically address graduate student obstacles in such efforts (funding and mentoring models including fellowships and TA support).
- Encourage, catalyze, and facilitate team grant submissions by overcoming challenges to administering team grants such as shared credit distribution for cross-programmatic awards.
- Catalyze NRT(-like) efforts. The NSF Research Traineeship (NRT) program is designed to encourage the development and implementation of bold, new, and potentially transformative models for graduate education training in science, technology, engineering, and mathematics (STEM). We should participate at a high level in this and analogous federal programs.
- Increase cross-disciplinary training of graduate students and recruit faculty for joint appointments to facilitate this goal. Create a designated funding stream to build and sustain interdisciplinary graduate programs and to facilitate collaborations among faculty from different units.
- New research initiatives involving interdisciplinary and cross-disciplinary collaborations can build on existing programs at UCR, including the activities based at the Center for Ideas and Society, the UCR California Agriculture and Food Enterprise (CAFÉ), and the Center for Health Disparities Research, among the many campus interdepartmental graduate programs.
- Additional initiatives with broad cross-disciplinary themes include human communication, global health, biotechnology, human ageing, air quality, social justice, and climate change.
- Engage the community as research partners to help define priorities. Build on existing community-engaged research to reframe conventional academic perspectives, expanding the horizons of research goals and distinguishing UCR from its peers.
- Allocate resources in support of interdisciplinary research and training programs that are moved outside the traditional structure of colleges and schools. These could be distributed and administered through the Office of Research and Development (RED).
- Novel interdisciplinary research and scholarship programs should be designed to attract new categories of faculty and students and boost the University brand as an innovative institution.
- Provide incentives for campus interdepartmental graduate programs to promote interdisciplinarity as a standard choice in graduate curricula and doctoral thesis projects.
- Develop new, unconventional metrics of success for cooperative and community-engaged research achievements and include these measures in evaluations of faculty merit and promotion files. Recognize the importance of

interdisciplinary collaborations, appropriately rewarding individual faculty and research programs in collaborative publications and funding.

(7) Build core facilities.

Such shared resources address one of the major problems on campus—that is, the lack of technical support staff, which disproportionately impacts early career scientists (e.g., the challenges of building a large lab during the early years of a professorship).

- Balance centralization of facilities with the specialized needs of individual researchers. There is no one-size-fits-all model, but there are ways to maximize the impacts of major start-up funds, avoid redundancy, and pool resources.
- Substantial University funds should be committed to building, operating, and maintaining shared core facilities.
- Address essential needs of shared and individual labs and other facilities through machine and electronic shops and other supporting services such as access to cleanrooms. These campus shops/facilities provide essential research support and educational opportunities when students are involved with design and construction.

(8) Increase staff support for grant submission and management. Ambitious faculty, students, postdoctoral fellows, and staff must be encouraged and rewarded for frequent high-quality submissions.

(9) Continued/elevated support of media relations to increase our regional, national, and international profile.

(10) Create world-class science museum to serve the public and the UCR research community.

The museum should be hands-on, emphasizing natural history and technology and target learning through a personal, innovative, multisensory experience rather than conventional text-heavy exhibits.

The museum would greatly expand our collective and individual outreach/broader impacts and the University's research and teaching agendas. It should be a 'working museum,' including internships that extend to the community (high school and middle school) and undergraduate and graduate student opportunities. It should foster a culture of training in broader impacts for our students and postdoctoral fellows and faculty. The museum should include community activities (science days, 'meet a scientist', high-profile lectures and lecture series, etc.) and might include an auditorium for lectures and perhaps IMAX capabilities and high quality space for receptions and small conferences. A planetarium and/or observatory would have high impact. The observatory could be placed in a nearby but less developed area to minimize light interference. The museum would become a natural home for broader impacts in federal grant submissions and be ideal for fund-raising and gift targeting. It would integrate with UCR research through, for example, collections

and educational training and could lead to a multi-departmental track (minor) in museum studies (art, education, diverse science and engineering programs, etc.).

UCR should continue to support its downtown museums (UCR Arts), while developing world-class, public-oriented museums on campus with ample parking for buses (school and tour) that feature in any guide to Riverside as one of the top things to do. Similar to the example of the Botanic Gardens (described below), the museums should become a pathway to UCR educational and enrichment programs for students seeking a degree as well as adults looking for personal and professional development while exploring educational possibilities for their children.

Develop public space/opportunities on campus and further utilize existing opportunities. For example, we can build on present successes with the UCR Botanic Gardens. We should seek to connect UCR more strongly with the Botanic Gardens in the minds of visitors and use it as a pathway to UCR education and enrichment programs for people in Riverside (and other visitors). We can imagine elementary and middle school students visiting the Gardens with their families (or on a school trip), participating in a program run by UCR faculty or students, and through this gateway come to see UCR (and a college education in general for the first-gen student) as accessible, available, and appropriate. UCR and the UC campuses operate other natural sites that people visit and might be used as a similar resource (e.g., the University of California Natural Research System).

(11) Increase funding pool to the Office of Research and Development.

Periodically revisit the model for distribution of F&A funds and consider impacts across all disciplines. There are wide-ranging views on whether and how to change this distribution.

Highlight what is needed generally, emphasizing the need for pools of funds to seed new research directions, support infrastructure, etc.

(12) Bridge undergraduate successes and opportunities to RSD.

Find novel ways—such as creating a pipeline of exceptional students (particularly from underrepresented groups) into world-class graduate and professional programs. For example, build on the success of the honors program and the Mellon Mays Undergraduate Fellowship Program. Bring the McNair Scholars Program to UCR and build additional special programs with necessary funding.

One success story is the recent *Summer Learn & Earn* summer program, which provided opportunities for undergraduates enrolled in UCR summer classes to work at the same time (with financial compensation) in research labs. The specifics of this program are already in place, providing a platform for continued and growing success.

(13) Aim high in external support/partnerships.

Existing models: OASIS, CARB (California Air Resources Board), CE-CERT.

Examples of new possibilities: develop (i) an **Inland Empire Research Corridor** emphasizing clean technology, carbon neutrality, water resources, sustainability of arid region agriculture, etc., (ii) a **Center for Renewable Energy: Applications, Technology development, and Entrepreneurship** (CREATE, motivated by our unique regional proximity to world-class geothermal, wind, and solar resources), and (iii) **Center for Integrated Wildfire Research** (drawing on our existing strengths in climate/weather, ecology, plant science, fire science, etc.).

Continue to seek selection for hosting national and state facilities/centers.

(14) Continue to support and grow relationship with UC Mexus.

(15) Support our library system at the highest level, developing and maintaining world-class collections and access.

(16) Further develop relationships between COR (Committee on Research) and RED.

(17) Elevate enrollment among underrepresented groups in graduate programs through community outreach and increased representation among our faculty and become an internationally recognized pipeline to the national professoriate.

UCR has a diverse undergraduate enrollment that is not reflected in its faculty and graduate student composition. The structural impediments affecting growth of diversity in research faculty and graduate programs need to be actively addressed in pipeline programs, faculty hiring, as well as in trainee and faculty mentoring in career advancement. The university must encourage and facilitate recruitment, academic achievement, and retention for researchers from diverse backgrounds.

- Nurture pipelines at all levels: high school to college, college to graduate/professional programs, graduate to postdoctoral fellow, and on to faculty positions. UCR could lead the nation in placing individuals from groups underrepresented in academia into top faculty positions around the nation and become nationally recognized for this achievement.
- Create new opportunities for funding that target underrepresented groups and build on existing successful programs, such as the UC President's & Chancellor's Postdoctoral Fellowship Programs, which are also a direct, subsidized path to UC faculty appointments.
- Achieve these goals beginning with grassroots outreach activities. For example, we should build on the success of the Gluck Fellows Program of the Arts and UCR's Day of Science by repeating, expanding, and adapting for other disciplines. (The Day of Science has been conducted entirely in Spanish, as one path to optimizing community impact.) Such programs should be geared toward families with K-12 children and include games, giveaways, faculty demonstrating inventions and techniques, admission representatives looking for promising high school students, etc. One of the goals should be to highlight career choices that few families will

know—sharing opportunities with the student and parents/care givers, thereby demonstrating that UCR recognizes and embraces the Riverside community.

(18) World-class research and scholarly distinction require world-class support of all aspects of faculty, student, and staff life.

In particular, continued and elevated support of Early Childhood Services and the Child Development Center will ensure that the children of faculty, students, and staff are provided a safe and convenient environment for learning and nurtured creativity and peer interactions. At the same time, parents are able to better perform their many important tasks in research, teaching, and service with the knowledge that their children are receiving the best possible care and education.

D. Closing Remarks

In closing, as a rapidly rising University, UCR is already making significant impact with its research and other scholarly work. We encourage renewed commitments that build on its existing strength and unique position in the state, national, and global communities by expanding its reach in emerging areas, particularly interdisciplinary frontiers defined by societal and intellectual responsibility.

Chair: Xiaoping Hu, Bioengineering

Vice Chair: Timothy Lyons, Earth Sciences

Faculty Members:

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- Katherine Sweeney, Professor of Psychology, CHASS
- Jennifer Merolla, Professor of Political Science, CHASS
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