ACRA

Academic Career Readiness Assessment

Winner of the First Prize 2019 AAMC Innovations in Research and Research Education Award

Clarifying Training Expectations for Future Faculty in the Life Sciences

Laurence Clement, PhD
Jennie Dorman, PhD
Rick McGee, PhD

Developed with the support of Burroughs Wellcome Fund

UCSF Office of Career and Professional Development
Student Academic Affairs

What is the Academic Career Readiness Assessment (ACRA)?

The Academic Career Readiness Assessment (ACRA) is a rubric developed by the Office of Career and Professional Development (OCPD) at the University of California, San Francisco (UCSF) with a grant from Burroughs Wellcome Fund. In 2019, it received the Innovation in Research and Research Education award from the Association of American Medical Colleges. The goal of ACRA is to provide life science graduate students and postdoctoral scholars with the information they need to explore, plan for and apply to faculty positions at different types of institutions, regardless of their understanding of the intricacies of the U.S. education system and independently of the mentoring they receive. The rubric can also be used to inform faculty hiring practices and provide transparency in the faculty hiring process.

Plan on using ACRA? Contact Laurence Clement, Director of Research in Career Education, UCSF Office of Career and Professional Development, laurence.clement@ucsf.edu. Help us continue to improve graduate and postdoctoral training by completing our trainee survey: http://bit.ly/ACRAtrainee or our faculty survey: http://bit.ly/ACRAfaculty. Receive updates about additional tools and publications through our email list at career.ucsf.edu/ACRA.

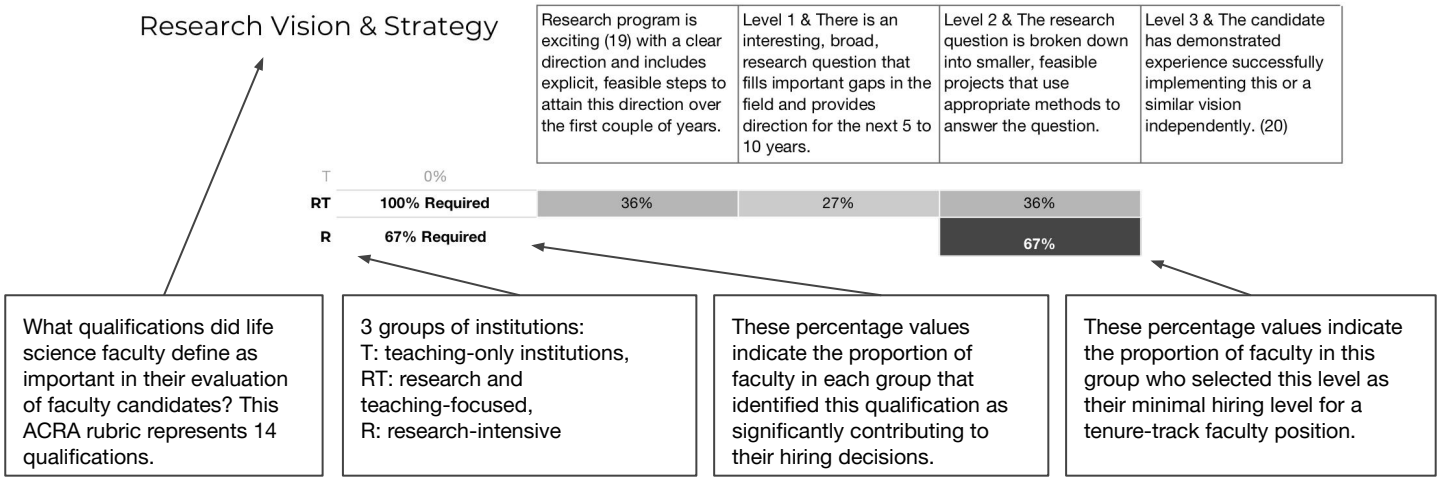
Who developed ACRA?

Laurence Clement, PhD - University of California, San Francisco
Director, Research in Career Education, Office of Career and Professional Development
Associate Adjunct Professor, Department of Social and Behavioral Sciences
PI, Burroughs Wellcome Fund CGT grant "A Career Readiness Framework for Research Trainees" (2015-2017)

Jennie Dorman, PhD - Research Director, University of California, San Francisco

Rick McGee, PhD - Associate Dean for Professional Development, Northwestern University Feinberg School of Medicine - Associate Professor of Medical Education, Scientific Careers Research and Development Group

How to read ACRA:



How was ACRA developed?

The ACRA rubric is the result of a study which involved interviewing eighteen biology and biochemistry faculty across the country who have experience participating in the hiring of new tenure-track faculty in their field [1]. It aims to describe the qualifications (such as publications, teaching experience, or commitment to diversity) that contribute significantly to hiring decisions for life science faculty positions at three groups of institutions. Institutions were categorized using the 2015 Carnegie Classification of Institutions of Higher Education [2] as follows:

- R group: research-intensive institutions with limited teaching requirements (R1 institutions, referred to as R institutions in this study, n=4 faculty representing 5 institutions),
- RT group: institutions with both research and teaching requirements (including Primarily Undergraduate Institutions (PUIs) and Liberal Arts Colleges (LACs), or RT institutions in this study, n=10 faculty),
- T group: teaching-only institutions (such as Community Colleges, or T institutions, n=4).

In the October 2019 version of ACRA, we have included the responses of these faculty to a survey intended to confirm language used in the ACRA and identify minimal hiring levels for each type of institution (T: n=3, RT: n=12, R: n=3).

[1] *Faculty positions in the life sciences: Improving trainees' awareness of hiring criteria. J.B. Dorman, T.A. Nguyen, N. Saul, R. McGee, A.C. Goldfien, L. Clement. American Society for Cell Biology Annual Meeting. December 2016. Poster Presentation.*

[2] http://carnegieclassifications.iu.edu/index.php

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Qualification		Level 1	Level 2	Level 3	Level 4
T					
Teaching Practices		Candidate shows awareness of their limited teaching abilities and is interested in developing teaching skills.	Level 1 & Candidate is familiar with the evidence supporting the use of active learning strategies in the classroom.	Level 2 & Candidate demonstrates that they can use active learning strategies effectively in the classroom.	Level 3 & Candidate reflects on own teaching effectiveness and uses an iterative process to teaching to improve curriculum (1).
	T	**91% Required**	18%	27%	27%	18%
	RT	**91% Required**	14%	36%	32%	9%
	R	42%	32%	11%		
Teaching Experience		Candidate has had significant responsibilities (2) as a teaching assistant.	Candidate has been fully responsible for organizing (3) and teaching a course.	Candidate has been fully responsible for organizing (3) and teaching a course with a comparable student population (4).	Candidate has been fully responsible for organizing (3) and teaching a variety of courses (5) with a comparable student population (4).
	T	**100% Required**	18%	18%	55%	9%
	RT	**86% Required**	27%	36%	14%	9%
	R	21%	21%			
Commitment and Ability to Serve a Diverse Student Population		Candidate demonstrates the sensitivity, respect for individuals of all backgrounds, and the interpersonal skills to interact with them.	Level 1 & Candidate has immersed self in a diverse community, or has mentored, advised or taught diverse populations of students.	Level 2 & Candidate has used strategies to support learning of diverse populations of students.	Level 3 & Candidate can articulate a personal experience with equity or social justice that inspires them to improve learning experiences of diverse populations of students. (6)
	T	**82% Required**	27%		45%	9%
	RT	**82% Required**	59%	9%	3%	9%
	R	34%	32%			3%
RT						
Inclusion of Undergraduate Research Experiences in Research Plan		Candidate demonstrates a clear understanding that they will be working with undergraduate and/or Master's students.	Level 1 & Candidate understands the implications of doing research with non-PhD students on scope of project.	Level 2 & Research plan is specifically tailored to the institution's undergraduate and/or Master's population.	Level 3 & Candidate is able to propose projects of different calibers for different student populations. (7)
	T	9%	9%			
	RT	**91% Required**	18%	9%	55%	9%
	R	5%	5%			
Experience Conducting Research with Students		Candidate can articulate a scientific mentoring philosophy that meets the needs of the non-PhD student population served by this institution.	Level 1 & Candidate has experience conducting research with non-PhD students	Level 2 & Research conducted with non-PhD students produced preliminary data.	Level 3 & Data produced by non-PhD students was included in a scientific poster or paper.
	T	27%	18%	9%		
	RT	**82% Required**	45%	36%		
	R	16%	13%	3%		

T: Teaching-Only institutions (n=11)

RT: Research- and Teaching-Focused institutions (n=22)

R: Research-Intensive institutions (n=38)

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RT

R

Qualification		Level 1	Level 2	Level 3	Level 4
Research Feasibility with Available Resources		Candidate demonstrates ability to develop a research program within the limitations of the start-up funds. (8)	Level 1 & Candidate demonstrates the ability to independently manage and run the equipment required for their research program. (9)	Level 2 & Research program is feasible in the institution's research and geographic environment, which includes some minor constraints. (10)	Level 3 & Research plan is tailored to the non-R1 institution's highly limited resources. (11)
T	9%	9%			
RT	82% Required	14%	9%	36%	23%
R	66% Required	16%	26%	24%	
Verbal Communication of Research		Can present research clearly and effectively to labmates.	Can present science clearly to scientists in the same sub-discipline (for example, to other microbiologists).	Can present science clearly and effectively to scientists outside of subfield.	Can present science clearly and effectively and can spark the interest of scientists outside of subfield and non-PhD students.
T	27%	9%		9%	9%
RT	73% Required			14%	**59%**
R	87% Required		3%	**61%**	24%
Publications		Candidate has produced a few papers, regardless of authorship or impact.	Candidate has produced first author papers during postdoc and (12) PhD (regardless of impact) (13).	Candidate has produced first author papers during postdoc and (12) PhD, with at least one paper contributing significantly to the field (14).	Candidate has produced first author papers during postdoc and (12) PhD, at least one of which was published in Cell, Nature, or Science (15).
New T	18%		18%		
RT	77% Required	9%	**64%**	5%	
R	100% Required		3%	**95%**	3%
Research Vision & Strategy		Research program is exciting (16) with a clear direction and includes explicit, feasible steps to attain this direction over the first couple of years.	Level 1 & There is an interesting, broad, research question that fills important gaps in the field and provides direction for the next 5 to 10 years.	Level 2 & The research question is broken down into smaller, feasible projects that use appropriate methods to answer the question.	Level 3 & The candidate has demonstrated experience successfully implementing this or a similar vision independently. (17)
T	9%	9%			
RT	77% Required	41%	18%	18%	
R	87% Required	13%	29%	34%	11%
Funding Plan		Candidate can suggest specific funding agencies and program names to fund proposed research program. (18)	Level 1 & Proposed research program is ambitious and impactful enough to be funded by an R01 grant. (19)	Level 2 & Candidate has developed specific aims that can be realistically achieved with a first R01 grant. (20)	Level 3 & Candidate has developed a funding plan beyond the first R01 grant. (21)
T	9%	9%			
RT	45%	45%			
R	68% Required	8%	24%	34%	3%
Research Independence		Candidate has the technical expertise to run their proposed research program independently. (22)	Level 1 & Candidate shows ability to lead a research program, by developing own ideas and new collaborations independently. (23)	Level 2 & Candidate's proposed research program does not appear to be in competition with their current advisor's. (24)	Level 3 & Candidate can provide evidence of independence through advisor's recommendation letter.
T	0%				
RT	59% Required	27%	23%	5%	5%
R	82% Required	11%	32%	24%	16%

T: Teaching-Only institutions (n=11)

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R: Research-Intensive institutions (n=38)

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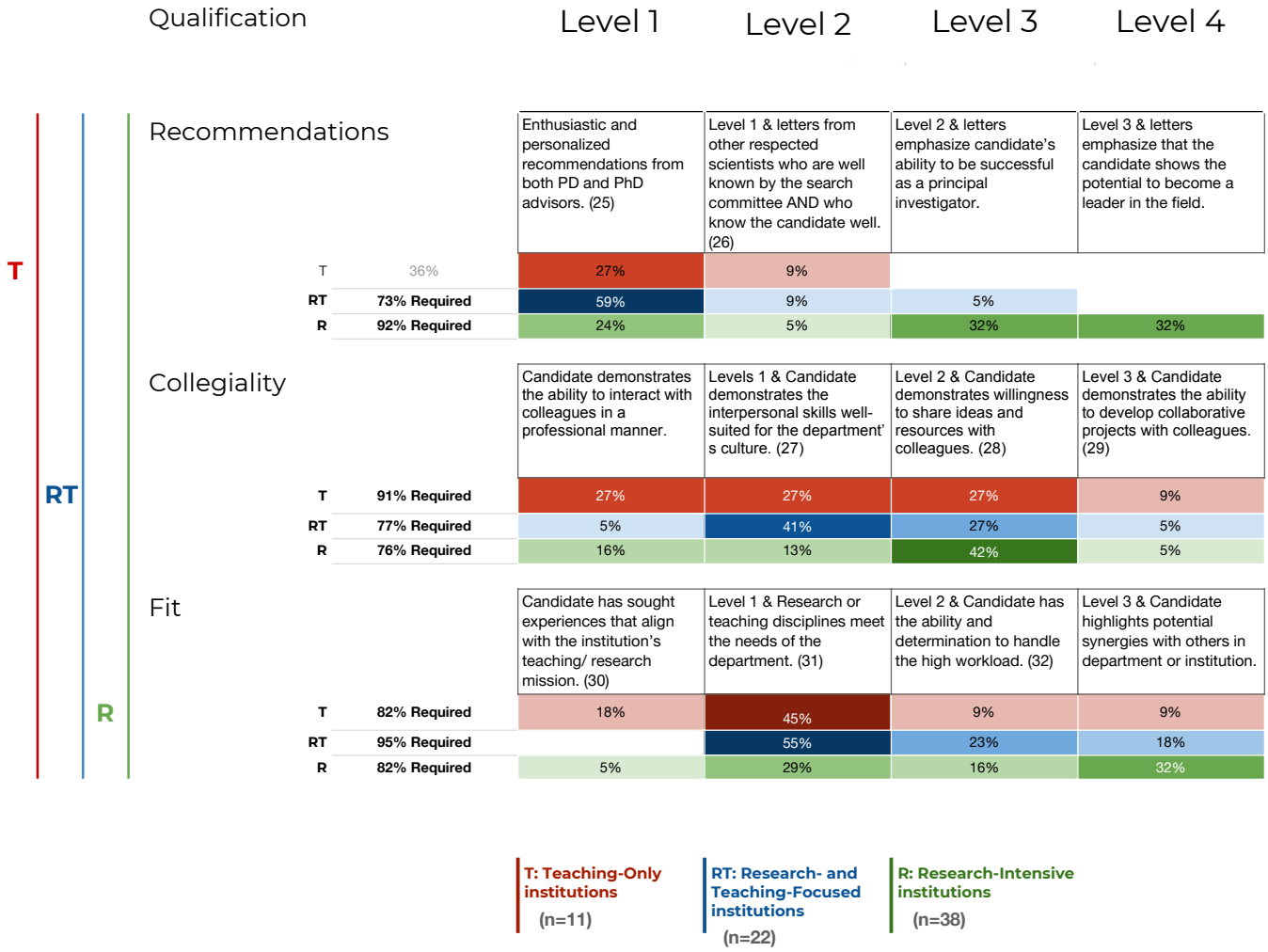

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ACRA Supplemental Information

1. An additional level was suggested as being advantageous, but not required for a faculty position at T and RT institutions: “Level 4 & Candidate has collected evidence on student learning (discipline-based education research).”
2. Including curricular and management responsibilities and substantial interactions with undergraduate students. These candidates should be able to demonstrate their effectiveness through course evaluations, their philosophy through their teaching statement and their potential in the teaching demonstration. These candidates should also show potential for being mentored as a new faculty.
3. Including curricular responsibilities (syllabus, lecture, assignment and exam development). Candidates should be able to demonstrate their classroom management skills in the interview.
4. In particular, lower-division undergraduate students.
5. For e.g., at an RT institution as a Visiting Assistant Professor, and at a T institution as an Adjunct Faculty.
6. An additional level was suggested as being advantageous, but not required for a faculty position at T institutions: “Level 4 & Candidate has collected classroom or institutional data around equity and has engaged in efforts to create an equitable learning environment for students.”
7. The research program should include projects that are compatible with the institution’s typical course schedule, diverse levels of research skills (novice vs. advanced) and education levels (freshman, senior, Master’s student).
8. At R1 and R2 institutions, this is mainly applicable to candidates who come from large, highly funded labs (for e.g., HHMI-funded labs) and whose program scope needs to be tailored to the resources available to a junior PI in the first few years, as they grow their team.
9. At R1 and R2 institutions, this is mainly applicable to candidates who require high-end equipment.
10. At some R1 and R2s, this may mean the absence of a certain type of facility, or a lack of space in the animal facility, or the distance from the medical school for work on human subjects or samples.
11. At RT institutions, where start-up funds are limited and core facilities often nonexistent, research requiring some animal models or expensive equipment may not be feasible. Candidates are expected to tailor their research plan the specific resources of each institution.
12. The word “and” here refers to the frequency of publications during a candidate’s training. “And” indicates that the hiring committee is looking for a consistent pace of publication, both during graduate school and postdoctoral training. Some RT institutions indicated that they were looking for candidate has produced at least one first author paper during postdoc or PhD (regardless of impact or frequency)
13. The number of papers required to get a faculty job offer was related to the level of research at that institution per the Carnegie Classification, i.e. R2 institutions required a dozen publications, if not of high impact, while R3 and M1 institutions required “a couple” of publications (for e.g. two first author publications during the PhD and two during the Postdoc).
14. Faculty have reported that hiring committees often discuss a paper’s contribution to the field beyond the impact factor of the journal in which it is published, considering important journals to specific subfields, and work that shows potential to advance science, as well as the creativity of the research and the novelty of the findings.
15. The faculty members in our sample did not necessarily require these types of publications, but did describe a tension within hiring committees with other faculty members around this. Some suggested that there may be an implicit bias in favor of candidates with these types of publications.
16. For e.g., research question is exciting, or methodology is cutting edge. The emphasis at R1, R2 and RT institutions is on getting other faculty excited about this research. In addition, at RT institutions, faculty members will be looking for a research program that is exciting for students.
17. This can include having previously identified a gap in the field and developed and conducted experiments to fill this gap as a postdoctoral scholar, or having previously collected preliminary data to demonstrate the technical feasibility of the program.
18. R3, M1 and M2 institutions prefer a candidate that has at least given some thought to the type of funding program that could support their research plan.
19. At R1 and R2 institutions, the research program is assessed through the lens of an R01 grant study section. Candidates are expected to demonstrate creativity, as well as to discuss the potential impact of their research program on their field.
20. Candidates are expected to present specific aims that are within the scope of R01-funded grants.
21. This can include specific aims for large grants other than the first R01 grant.
22. In the case where the program relies on collaborations, these collaborations will be maintained in new position.
23. This stage corresponds to a shift from the postdoctoral to the faculty identity. In addition to having a clear research vision and strategy, the candidate will need to demonstrate an ability to envision alternative approaches, evaluating results, and setting new directions for a project.
24. Because the projects are distinct, or because the advisor and candidate plan to maintain clear boundaries.
25. This enthusiasm is more impactful when expressed by a scientist who is not typically as enthusiastic about applicants, and when it is personalized, i.e. specifically describes the candidate, their accomplishments and their potential. In addition, having the recommender reach out directly to the search committee can be influential. Note that some RT (but no R) institutions have reported following up with candidates who are missing a recommendation letter from one of their PIs.
26. Either through personal connections or because the PI has a strong reputation in the field.
27. At R institutions, this involves demonstrating curiosity for other faculty’s work and ideas, while at RT institutions, it involves getting along with colleagues. At T institutions, this fit is often demonstrated through other competencies, like Teaching Potential, Teaching Experience or Commitment to Serving Diverse Students, as a sort of compound competency.
28. At RT institutions, this may involve sharing of equipment, space and materials. At T institutions, it involves discussing and sharing curriculum and course materials, and discussing interaction with students.
29. At RT institutions, this may be collaborating on research or educational projects. At T institutions, it may look like team-teaching, collaborating with a colleague on the development of new curriculum or the development of a learning community.
30. For example, when applying for position at a T institution, the candidate has sought out opportunities to teach to align with the institution’s teaching mission.
31. At R1 and some R2 institutions, this means that the candidate’s research expertise does not compete with existing research programs. At RT, T and some R2 institutions, the teaching discipline potentially covered by the candidate fill a gap in the department.
32. At RT institutions, this means a high teaching load. At R2 institutions, it means a high teaching and research load.

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