The goal of TEACRS is to prepare talented postdoctoral scientists for productive academic careers that involve research on a biomedically relevant problem. A young professor must develop many talents to be successful on such a career path. These include the abilities to independently design and execute a rigorous research program, to effectively present findings in written and oral formats, to write compelling and well-argued proposals for research funding, and to enthusiastically and skillfully mentor younger scientists who are working on the lab’s projects. He or she must also be adept at the other responsibilities assigned to faculty, such as teaching and university service. Consistent with the emphasis on research training, TEACRS fellows are expected to spend 75% of their time on research activities, under the mentorship of one of the faculty of Tufts University. This document describes the mechanisms by which TEACRS hopes to facilitate this training and the respective roles of the Research Mentor, the Scholar Mentoring Team, and the Career Advisor. The following topics are covered:

- The Research Mentor
- The Scholar Mentoring Team
- The Career Advisor
- The research seminar
- Spring research retreat
- Support for research conferences
- Evaluation of research progress
- Grant writing
- Participation in activities outside of the lab
- Balancing teaching and research
- Making the transition and developing a research project of your own
- Citing the TEACRS grant in publications
- The Mentoring Team Summary Report Form

The general training plan for TEACRS is outlined below, so that you can see how the research, teaching and enrichment components interweave with each other.

<table>
<thead>
<tr>
<th>TEACRS Training Plan</th>
<th>Year One</th>
<th>Year Two and Three</th>
<th>Year Four</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Research</strong></td>
<td>Develop project &amp; initiate research</td>
<td>Research continues</td>
<td>Complete research &amp; develop transition plan</td>
</tr>
<tr>
<td>Entry into TEACRS</td>
<td>Form and meet with Mentoring Team</td>
<td>Mentoring Team meetings</td>
<td>Mentoring Team meetings</td>
</tr>
<tr>
<td></td>
<td>Human subjects &amp; Animal Training (as required)</td>
<td>Publication strategy developed</td>
<td>Prepare &amp; rehearse job seminar</td>
</tr>
<tr>
<td></td>
<td>Attend national research meeting</td>
<td>Present at national research meeting</td>
<td>Complete publications</td>
</tr>
<tr>
<td><strong>Teaching</strong></td>
<td>Attend orientations at partner schools</td>
<td>Develop and present course at partner school</td>
<td>Workshops on pedagogy</td>
</tr>
<tr>
<td></td>
<td>Workshops on pedagogy</td>
<td>Workshops on pedagogy</td>
<td>Mentor an undergrad or PREP trainee</td>
</tr>
<tr>
<td></td>
<td>Attend Graduate Institute For Teaching (GIFT)</td>
<td>Mentor an undergrad or PREP trainee</td>
<td></td>
</tr>
<tr>
<td><strong>Enrichment</strong></td>
<td>Research-focused seminars &amp; journal clubs</td>
<td>Research-focused seminars &amp; journal clubs</td>
<td>Research-focused seminars &amp; journal clubs</td>
</tr>
<tr>
<td></td>
<td>Attend annual IRACDA conference</td>
<td>Attend annual IRACDA conference</td>
<td>Attend annual IRACDA conference</td>
</tr>
<tr>
<td></td>
<td>Responsible Conduct of Research Training</td>
<td>Career counseling; review &amp; update IDP</td>
<td>Career skills workshops</td>
</tr>
<tr>
<td></td>
<td>Career skills workshops</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Begin independent faculty position</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Research Mentor

The Research Mentor is the Tufts faculty member who is directly supervising the scholar’s research. The choice of Research Mentor has usually been made before the application to TEACRS is submitted. This decision is based on sufficient communication between the prospective mentor and mentee to give confidence that a mutually beneficial relationship can be established. Part of this process involves deciding on a research project that can be started quickly once the fellow arrives at Tufts. A proposal describing this project is a required part of the TEACRS application package, in order to show that a clear and feasible plan has been developed for the research training.

We anticipate that the Research Mentor, in addition to supervising the scholar’s research, will also coach the scholar in, and provide opportunities for developing the other skills that make for a successful principal investigator. These include mentoring students in the lab, the writing or reviewing of grants and manuscripts, and the presentation of results at both local and national or international conferences in the field.

The Scholar Mentoring Team

Because of the demands of the TEACRS training, we have the fellows set up meetings with their mentoring team twice each year to provide guidance. The goals of the mentoring team are four-fold:

1. To serve as a resource for the fellows as they plan and carry out their postdoctoral research and to ensure that the scholars will have developed a project that will result in first-author publications and can be used to establish an independent research program

2. To help the scholars develop skills in scientific writing and presentation by providing feedback on the written research reports, manuscript and grant drafts, oral research presentations, and practice job seminars

3. To provide guidance on issues that arise regarding mentoring or responsible conduct of research

4. To help the scholars develop the time management and prioritization skills critical for academic success

In consultation with the research mentor, each scholar should form and meet with a mentoring team within three months of joining the program. The team will consist of the research mentor and two faculty who have expertise relevant to the project. The faculty need not be members of the scholar’s home department. Many scholars have found it useful to bring additional experts onto their team from outside of the department, or even Tufts, as their research evolves in new directions. Some find that having a faculty from a primarily undergraduate institution (PUI), such as a TEACRS alumna, is helpful if a PUI position is the career goal. The mentoring teams should meet every six months, or more often if the research is approaching a critical decision point.

For the first meeting (but not for subsequent meetings), the scholar should prepare a written research proposal (2-3 pages suggested) that describes the background of the project, the long-range goals, and the specific goals to be met in the upcoming six months. It can include preliminary data if available. This report should be distributed to the team members a few days before the meeting. The mentoring team will discuss the proposal with the scholar and provide feedback on the research project and whether the best experimental approach is being taken. The team will also provide feedback on the clarity and style of the written report to assist scholars in fine-tuning their writing skills. Goals for the next 6 months should also be discussed.
After the meeting, the scholar will complete a summary form describing what was discussed during the meeting and send it to the team members, who can then suggest modifications. As there is often wisdom in hindsight, in this e-mail, the scholar could encourage dialog by asking for one concrete recommendation for the next six months that the team member believes would most help in working toward the stated research and/or career goals. These recommendations are not meant to be benchmarks, but advice that the scholar may wish to consider in moving forward. All team members should approve and sign the final summary. The scholar will then submit the summary and the written research report via the TEACRS Trunk site.

The mentoring team will meet throughout the training at 6-month intervals to provide feedback about the current research direction and the next steps as outlined by the scholar. For each of these meetings, the scholar should prepare and deliver to the mentoring team a partially completed summary form. The scholar is also encouraged to include a list of any specific issues about which he or she would like advice. After the meeting, the scholar should complete the summary form, obtain the team members’ input and signatures, and submit the research report and summary form to the TEACRS Trunk site by the designated deadlines.

The mentoring teams work best if meetings are held on a regular basis. To ensure this, we ask that you provide documentation of completed meetings via Trunk by April 1 and October 1 of each calendar year. Scholars who do not meet these dates and have not made other arrangements with the program directors may have their supply and travel budgets frozen until the reports are submitted.

**Preparing scholars for the job market**

Feedback from scholars, research mentors, and career advisors indicated that some scholars would like more support regarding how to develop viable research proposals and publication records appropriate for establishing an independent career, as well as how to make the transition to a faculty position.

Thus, we are asking that scholars explicitly discuss these topics with their mentoring team beginning in Year 2. Accordingly, the scholar’s research reports in Years 2-4 should include outlines for possible publications and plans to bring these publications to fruition. In addition, the reports should describe what steps the scholar has taken towards developing their own independent research program.

One of the mentoring team meetings should be scheduled sometime in March before the last year of training begins. At this point, the research report should include a plan to use the final year to develop the research into a project that the scholar can continue after obtaining a faculty position and that is suitable for the type of academic position that the scholar is seeking. If the scholar plans to spend an additional year in the mentor’s lab beyond the TEACRS appointment, this discussion can be postponed to the following spring. The focus instead can be on possible funding sources to cover the extra postdoctoral year. We hope that the mentoring team members will also be willing to mentor the scholar through the job search process.

**The Career Advisor**

Each scholar is assigned a Career Advisor who is either a member of the Tufts faculty or a former TEACRS fellow and will be notified of this assignment by Dr. Mitch McVey, the Director of Research Activities. The role of the Career Advisor is help the scholar prepare for the transition to an independent position, to be a resource for career advice, and to meet with the scholar approximately twice each year to make sure that the scholar is on track to reaching the goals of the program described above. Career Advisors can change during the scholar’s tenure, especially when specialized expertise is needed.
The research seminar

After the first year, the scholar is expected to present a research seminar once each year to an audience that is broader than that of the mentor's laboratory. Most departments and programs at Tufts have seminar series in which postdocs can participate, and many fields have Boston-area groups that meet on a regular basis. Either of these venues is appropriate, but a poster presentation or short talk at a research conference would not satisfy this requirement. The scholar is responsible for arranging a time for this presentation and informing the mentoring team members, the Program Coordinator, and the TEACRS Program Directors. The Program Directors will then notify the other TEACRS scholars, so that they can also attend and provide feedback. In the fall in which the scholar is conducting a job search, one of these seminars can be a rehearsal for the interview talk.

Spring research retreat

Each year in late spring (usually in May), all of the TEACRS fellows come together for a day-long research retreat. Typically, this retreat utilizes a "chalk talk" format, in which fellows present their current research (and potentially their future plans) without any Powerpoint slides. Because many faculty job interviews now include chalk talks, this is a good way for you to practice this type of presentation.

Support for research conferences

The TEACRS Program has funds to help cover the costs for the scholar to attend one research conference in an area relevant to the scholar's research. The research mentor should send an e-mail to Dr. Mitch McVey, the Director of Research Activities, describing why this meeting is an appropriate one for the scholar. Once this request is approved by the Director, the scholar can work with the Program Coordinator to make reservations for travel and accommodations, and to pay the meeting registration fee. Please note: In order to get reimbursed for TEACRS-sponsored travel, you must have an account in the Tufts eExpense system. The TEACRS Program Coordinator can help you set this up.

Evaluation of research progress

Each year, the Program Directors will review the scholar research progress reports and check in with the research mentor. Tangible progress such as generating results that lead to presentations at national meetings and publication in peer-reviewed journals will be another major benchmark for evaluating research progress. Scholars will also be expected to play a major role in designing the theoretical and technical aspects of the work and as training progresses, become fully independent. The overall goal of the training is to develop independent scientists who will successfully compete for faculty level positions. In the event that a scholar fails to make research progress, the Program Directors, in consultation with the TEACRS Advisory Committee, will consider dismissing the scholar from the program. The Advisory Committee is a panel of Tufts faculty who advises the Program Directors on best practices and helps in the evaluation of candidates to the TEACRS Program.

Participation in activities outside of the lab

Throughout each year, the scholar will be participating in various career development activities that will require them to be away from the lab. As part of accepting a TEACRS fellow, the research mentor has agreed to this arrangement, which averages during the time of the training to be about 75% of the time in research and 25% in other activities. In addition to periodic one or half-day workshops, there are three times when the scholar will be away for more than a day:

1. **Tufts Graduate Institute for Teaching (GIFT)**: Towards the end of May, first-year scholars take part in GIFT, which is an intensive, three-week course on the Medford campus that will prepare the scholar for the teaching assignment in the second or third year. During the GIFT course, the time that the scholar spends in lab will be limited.
2. **The annual IRACDA Conference.** This is a national meeting of scholars from all of the programs like TEACRS and happens usually during the second week in June for 2 and ½ days. Scholars are expected to attend this meeting and present their research there.

3. **The teaching assignment.** This involves being responsible for a full-semester course at one of the TEACRS partner institutions. It is likely that not much research will be done during this semester, and the mentor and scholar are encouraged to discuss ways in which the project can be kept moving, albeit at a slower pace.

The scholar is expected to inform the research mentor of the times when he or she will be out of the laboratory for TEACRS activities.

*Balancing teaching and research*

Depending on the type of course the scholar is teaching and the class hours, he or she may not be able to spend a lot of time in lab during the teaching semester. The scholar should plan ahead as to how to keep things going. They should discuss their schedule with the research mentor so that he knows that you are planning ahead, but perhaps not to expect to see much of you. Some scholars have felt that it was an advantage to be mentoring a student or post-bac trainee at that time, so that the student could help keep the project moving forward. Most everyone has found that it is possible to keep their research moving at least a little, and the periods of the GIFT training and the teaching semester provide a great opportunity to practice the time management skills that will be needed as a new professor. It is not impossible but takes focused effort and determination. The topic of balancing teaching and research will be formally addressed in the fall planning meetings by scholars who completed their teaching in the previous year.

*Making the transition and developing a research project of your own*

By the third year, the scholar needs to start thinking about what might form the basis of an independent research program as a new professor. It is a good idea to bring this up on a regular basis with the mentor and also solicit the input of faculty on the Mentoring Team as well as senior TEACRS scholars or recent TEACRS alumni. Here are some questions that might help plan for the transition:

- Will you continue with the same model system? Is that feasible at the type of institution where you would like a position, or do you need to think about modifications or developing collaborations that will continue once you leave Tufts?
- If you want to go to a PUI, can the research engage undergraduate students? Have you tried this out by mentoring a student at Tufts?
- What do I need to do to get publications from my work, as this supports the premise that I am capable of doing it on my own? If you have not yet published a first author paper from your postdoctoral research, it could raise the question with a search committee as to whether you can carry a research project to completion, a task that is much more difficult if your future lab’s progress relies on the efforts of undergraduates. So, focus on getting the key experiments done and/or find ways to enlist the help of people who could become co-authors. Decide what the “minimal publishable unit” is and what experiments might provide the extra push to a higher-tier journal. Set a deadline for determining which way to go.
**Grant writing**

There will be several opportunities during the TEACRS training for workshops on grant writing. One, offered every other year, is a multi-part series that will involve writing a short proposal, which will then be reviewed by the faculty leading the workshop and the workshop participants. This proposal can serve as a basis for obtaining support for an extra year of postdoctoral training, or for applications to obtain research support as a new faculty member. Scholars who obtain support other than TEACRS are encouraged to continue to participate fully in the TEACRS Program.

**Citing the TEACRS grant in publications**

Each publication, press release or other document that cites results from TEACRS grant-supported research must include an acknowledgment of NIH grant support and disclaimer such as “The project described was supported by Award Number K12GM074869 from the National Institute of General Medical Sciences. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute of General Medical Sciences or the National Institutes of Health.”

TEACRS fellows are also required to comply with the NIH Public Access Policy. Upon acceptance for publication, an electronic version of the final peer-reviewed manuscript resulting from research supported in whole or in part, with TEACRS funding must be submitted to PubMed Central (PMC). The author's final peer-reviewed manuscript is defined as the final version accepted for journal publication, and includes all modifications from the publishing peer review process. In each of our annual progress reports to NIH, we will need to provide a list of any publications resulting from TEACRS support, along with the PMCID number. For additional information, please visit http://publicaccess.nih.gov/.

*Please contact the TEACRS Director of Research Activities, Dr. Mitch McVey (mitch.mcvey@tufts.edu, 617-627-4196), or the Program Director, Dr. Claire Moore (Claire.moore@tufts.edu, 617-636-6935) if you have any questions regarding these guidelines.*