Boosting the career development of postdocs with a peer-to-peer mentor circles program

Chantal Kuhn & Zafira Castaño

Mentor circles combine the advantages of both mentoring networks and peer-to-peer mentoring.

Different metrics show that only 15–20% out of the more than 56,000 postdocs¹ in the United States will become tenure-track faculty members², even though this is the career aim of nearly 80% of postdocs. This disparity makes it essential that postdocs become aware of alternative scientific career opportunities outside of academia and strategically develop skills that are necessary for their chosen career paths. Unfortunately, current postdoctoral training in the United States rarely includes consultations concerning career paths or the type of mentoring required for one to develop the necessary skills for future success. This clearly limits career options for many bright research fellows.

Effective mentoring is critical for professional success at every career level, particularly at times of transition. During the past decade numerous US institutions have developed mentoring programs for high school students, PhD candidates and faculty staff at universities^{3–7}. Results from these initiatives have clearly shown that effective mentorship is highly predictive of an individual's success^{5,8–10}. DeCastro *et al.*¹¹ nicely recapitulate the multiple requirements and responsibilities of a good mentor: teaching scientific knowledge and encouraging critical thinking; cultivating skills such as grant writing, research design, data analysis, manuscript

writing and publishing; assisting mentees in choosing the proper career path and obtaining a job; providing opportunities for networking; and giving encouragement and personal advice. However, today's scientific world is extremely dynamic and versatile, making it imperative to develop mentoring networks composed of individuals with different backgrounds, experience and scientific expertise to enable optimal career development^{12,13}. It is difficult for a single mentor to fulfill these expectations. For this reason we developed the Mentoring Circles Program (MCP) at Brigham and Women's Hospital (BWH) in Boston. This program is designed to help postdocs find their best career fit by showing them scientific opportunities inside and outside of academia, as well as each career path's requirements, advantages and disadvantages. Guided self-assessment helps postdocs to identify and develop the skills required to advance toward the profession that best matches their career aspirations. A major focus of the program is empowering our mentees to take responsibility for their own career development while guiding and supporting them during the academic year.

Why a mentor circle program?

Traditional academic mentoring consists of pairing a junior trainee, such as a postdoc, with an experienced senior investigator in the same academic discipline, often his or her primary investigator. Recently, this traditional mentoring approach has been moving toward mentoring networks and peer-to-peer mentoring¹¹. The MCP combines the advantages of both mentoring networks and peer-to-peer mentoring.

The professional development and networking resources offered by programs like the MCP not only provide the specific technical and logistical support to increase postdocs' chances of success, but also nurture

a supportive and protective environment where individuals are empowered to productively navigate through both their failures and their successes. Participation in a mentor circle exposes postdocs to different experiences and points of view, strengthens their ability to work on a team and collaborate with and support other people, and expands their network. The peer-to-peer component creates a closer and more approachable relationship between mentees and mentors who have encountered or are currently experiencing similar difficulties. Mentees can also identify with and be inspired by other mentees' or mentors' success stories, as seen in the following testimonials from those who participated in the program in its inaugural year:

"My mentor was the first person to show me my potential career options. This is an excellent program where each member is responsible for its success, and to maximize your gain, you have to see it as an environment to better yourself in multiple areas, not just the one you have in mind." —MCP 2013–2014 mentee¹⁴

"I'd like to become a mentor—I think this program really makes a difference. I learned how to organize my time, to improve my networking skills and to make effective presentations." —MCP 2013–2014 mentee

"There were even times when I gained more than the mentees, specifically when trying to guide and advise a group of exceptional scientists with different personalities is a learning experience on its own." —MCP 2013–2014 mentor¹⁴

"The MCP is the most gratifying experience I have had in my career. Getting the perspective of leadership in an informal setting was extremely valuable to improve my knowledge, communication skills, and challenge myself." —MCP 2013–2014 mentor

Chantal Kuhn is in the Department of Neurology, Ann Romney Center for Neurologic Diseases, Brigham and Women's Hospital, Boston, Massachusetts, USA and at Harvard Medical School, Boston, Massachusetts, USA. Zafira Castaño is at Harvard Medical School, Boston, Massachusetts, USA; Division of Hematology, Department of Medicine, Brigham and Women's Hospital, Boston, Massachusetts, USA; and the International Mentoring Foundation for the Advancement of Higher Education, Dedham, Massachusetts, USA. e-mail: zafiracastano@gmail.com

Structure and development

Recognizing the need to provide a comprehensive and coordinated approach to professional development and career advancement for postdocs with different career interests, the Postdoc Leadership Council created the MCP at BWH in 2013, inspired by the mentoring program of the Association for Women in Science^{3,4} (<http://mass-awis.org/mentoring-circles/>) and supported by the BWH Center for Faculty Development & Diversity. A planning group, consisting of two codirectors and a committee of four people, supervised the process. The pilot program, MCP 2013–2014, was based on three circles, each composed of two mentors and five mentees. Mentors were senior postdocs in the last years of their postdoctoral training at BWH with different career path interests. Mentees were junior postdocs in their first two years of postdoctoral experience at BWH. During the second year (2014–2015), MCP expanded to seven circles, and in the third year (2015–2016) MCP expanded its mentorship to eight circles. Mentors and mentees were primarily matched according to their career interests. To guarantee confidentiality, we avoided placing postdocs from the same labs into the same circle. Aware that diversity is a valuable asset, we aimed for a good mix in terms of gender and nationality. We conceptualized the MCP as a career learning and skill-development experience and recommended a minimum of one circle meeting per month for one academic year, from

September through May. Sessions focused on different topics about career development that were important for the respective mentees, according to the participants' specific needs (Table 1). The longitudinal nature of the program fostered trust and facilitated the development of informal, nonhierarchical relationships¹⁵. To promote open discussion, we required that participants agree to maintain strict confidentiality. Over the past year or two, we have assembled various resources for a mentoring tool kit (Table 1).

Events at the MCP

Mentor training event. This event serves multiple purposes: introducing the mentors to the program directors and to each other, informing the mentors about the background and concept of the MCP, and discussing topics that might be interesting for the different circles. The MCP codirectors provide the mentors with hard and soft copies of useful resources and tools (Table 1) and discuss upcoming questions with the support of former MCP mentors.

Kick-off event. The circles meet for the first time during this event, which consists of an introduction about the MCP by the codirectors, a keynote presentation on a topic related to career development by an invited speaker, a Q&A session with former MCP participants, and time for networking. Joanne Kamens, executive director of Addgene, was the keynote speaker at the 2013–2014 and 2014–2015 MCP kick-offs, and Lauren Celano, founder of Propel

Careers, was the keynote speaker for 2015–2016. The presentation by the MCP codirectors aligns the participants' expectations by giving concrete examples of topics that can be discussed at their meetings and communicates how to get the most out of the MCP—that is, through regular meetings, active participation and constructive feedback. Roundtables for each circle facilitate networking between mentors and their mentees, who are encouraged to discuss their expectations from the program.

Mentor mid-year meeting. In addition to being constantly available to give counsel and support, the MCP codirectors host a mid-year meeting to follow up with mentors and learn about encountered problems and success stories. Mentors have found it very helpful to discuss their issues with each other and to exchange ideas on how to improve their respective mentoring circles.

Mentoring celebration. In May, when the MCP officially ends for the year, an event is organized to honor the commitment of the participants, in particular the mentors. The mentoring celebration consists of a keynote speech by an experienced mentor, a short discourse by the codirectors, acknowledgment of the mentors and a networking event with food and drinks.

Assessment and evaluation of the MCP

When registering for the program, participants filled out a self-assessment survey that allowed them to examine their expectations of the program and their subjective baseline skills.

Table 1 MCP session topics and contents, 2015–2016

Session topic	Session content	Resources
Career development plan	Create short-, mid- and long-term goals, and follow up on them regularly	1
Self-assessment	Identify strengths and weaknesses	2
Identify relevant career paths in science	Evaluate interests for new career opportunities, and find those opportunities	3–11
How to transition and transfer your skills	Identify what skills can be transferred to scientific jobs outside of academia	12, 13
Work on developmental needs and resources to fulfill them	Identify classes, seminars, diplomas and/or certificates that might be important for your development	2, 14 and participants' organization events
Network	Improve and identify the network that will enhance your professional life	15–18
Get prepared for interviews	Practice in informal interviews, and improve your skills for the interview process	19, 20
Scientific communication	Improve basic communication skills; practice elevator pitches and scientific communication	21, 22
Update CV/biosketch/résumé	Work on your CV and use the feedback from circle members to improve it	23
How to write a letter of recommendation	Get advice on writing the perfect recommendation letter	24–27
Work–life balance	Be happy and work happier!	28
Solving international postdoc problems	Determine whether there is a real problem and identify a solution	29

Resource URLs: (1) <http://myidp.sciencecareers.org/>; (2) <http://pda.bwh.harvard.edu/mentoring/mentoring-tools/>; (3) <https://www.careereducation.columbia.edu/resources/tipsheets/non-academic-career-options-phds-sciences-engineering-and-mathematics/>; (4) <http://www.nextscientist.com/alternative-careers-for-phd-students/>; (5) <http://www.academiccareer.manchester.ac.uk/foryou/postdoc/stay/>; (6) http://www.apprise.ox.ac.uk/academic_career_paths/; (7) <http://www.theguardian.com/higher-education-network/blog/2014/mar/05/careers-higher-education-phd-doctorate-employment/>; (8) <http://www.universityaffairs.ca/opinion/the-black-hole/finding-a-suitable-home-for-your-research-program-part-1-reviewing-the-offer/>; (9) <https://targetjobs.co.uk/career-sectors/science-and-research/285505-beyond-science-alternative-graduate-careers-for-scientists/>; (10) <http://www.careers.ox.ac.uk/options-and-occupations/sectors-and-occupations/science-alternatives/>; (11) <http://www.sciencedirect.com/science/book/9780125893763>; (12) http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2004_05_14/nodoi.7805445794410933401; (13) <http://www.theguardian.com/higher-education-network/blog/2014/jan/10/researchers-developing-transferable-skills/>; (14) <http://www.brightandwomens.org/view/viewEvents.aspx?audience=1>; (15) <http://bwhmentoringtoolkit.partners.org/mentoring-and-your-career/exercise/>; (16) <http://www.propelcareers.com/>; (17) <http://www.massbio.org/>; (18) <https://www.linkedin.com/>; (19) http://www.careereducation.columbia.edu/sites/cce/files/columbia_cpg_14-15.pdf#page=34; (20) <https://www.careereducation.columbia.edu/resources/tipsheets/finding-a-job-interviewing/>; (21) <http://www.postdocjournal.com/>; (22) <http://courses.improvandy.com/courses/elevator-pitch-handbook-pdf/>; (23) http://www.careereducation.columbia.edu/sites/cce/files/columbia_cpg_14-15.pdf; (24) <http://www.limeconnect.com/blog/detail/writing-a-letter-of-recommendation-for-yourself/>; (25) <http://www.petersons.com/college-search/letter-recommendation-writing-yourself.aspx>; (26) <http://work.chron.com/write-letter-recommendation-myself-20249.html>; <https://medium.com/starts-with-a-bang/getting-the-best-letter-of-recommendation-e78258141bb9>; <http://www.truman.gov/letters-recommendation>; (27) <https://hbr.org/2010/04/how-to-ask-for-a-reference-let-1-2/>; (28) <http://www.worklifebalance.com/>; (29) <http://www.nationalpostdoc.org>

Figure 1 MCP participants' responses to the self-assessment survey. **(a)** In response to the question, "How much did these skills improve after one year at MCP?" mentees reported substantial improvement of their knowledge and skills during the course of the program. Graph represents the average ranking $\pm$ error SD ($n = 9$). **(b)** Percentage of promotions among mentees after one year in the MCP.

A second self-assessment at the end of the program provided a measure for improvement. All surveys were anonymous to encourage robust and confidential self-assessment and feedback. Two independent scientists evaluated the results of the surveys.

Both initial and final surveys included questions on the participants' skills. The final survey asked the mentees to evaluate the program and the mentors, and it also provided room for feedback on the most and least helpful elements of the program and on ways to potentially improve it. Participants represented a diverse group of individuals in terms of gender (66.6% of the participants were female), nationality, career aims and needs. The self-assessment revealed significant improvement of the participants' knowledge and skills during the course of the program. Mentees reported (with 60% participation in the survey) that their competency in development of career skills, exploring nontraditional careers, learning how to transition to industry, academic problem resolution, networking, interviewing skills, CV preparation, grant writing, science communication and improvement of work-life balance had improved (**Fig. 1a**). In the mentors' evaluation (83.3% participation), the program received the maximum score: 5 out of 5. All

mentors strongly agreed that the program had met their expectations and indicated that they would highly recommend it.

One year after the end of the first MCP program, 46.6% of participating mentees were promoted to instructors/junior faculty (20%), college professors (6.6%) or staff researchers (6.6%), and 13.3% moved to industry scientist positions (**Fig. 1b**).

Participants also reported substantial improvement in their confidence level and their ability to accomplish mentoring goals. Furthermore, they indicated that the program had a positive impact on their career development. Achievements directly attributable to participation in the program included reception of fellowships, successful oral presentations and job interviews, increased networking and nominations for governmental fellowships.

The fact that an average of 40% of the MCP participants continued their involvement in the next year's MCP demonstrates a high level of satisfaction and enthusiasm.

Social impact and future

Our program encourages its participants to become leaders and role models for other peers, progressively transmitting the

benefits of their mentoring experience to their colleagues and friends. As an example, one of the mentors from MCP 2015–2016 is developing a grant circle program for the postdoctoral community, in which postdocs will work together in a mentor-mentee relationship to improve their grant-writing skills.

Results from surveys and testimonies confirm that the MCP significantly promotes the career development of postdocs at BWH. Building on the success of the past three years, we currently sense a growing enthusiasm for the program, based on the increasing number of applicants each year; the positive outcomes attributed to the course, both publicly and privately; the development of a growing, interconnected community of mentors; and requests from other universities to help them establish their own mentor circles programs. We will continue to offer and evolve the MCP annually with the goals of enhancing the careers of the postdoctoral fellows with the BWH community and having a positive impact on society. We hope that this description of the MCP will assist other institutions that are considering developing similar mentoring programs.

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