CAREER DEVELOPMENT PROGRAM GOALS AND OUTCOMES

In today's extremely competitive job market, career success for early-stage scientists both inside and outside of academia requires more than just research expertise. In addition to the research and technical competencies gained through mentored research in the laboratory, today's scientists also need to develop proficiency with a wide array of non-bench professional skills. A recent report from the National Cancer Institute recommended a number of skills that would help graduate degree holders prepare for biomedical research careers. Among others, these skills included communication (writing, presenting, negotiating, and persuasion), leadership development (collaboration, mentoring, supervisory skills), and project management (planning, budgeting, organizational skills, problem solving; Mason et al., 2016). Similarly, a 2011 report by Monster.com identified the skills most important to recruiters and hiring managers: along with general characteristics of hard workers, this list included communication, problem solving, team work, logical thinking, time management, leadership, and organization (Monster.com, 2011).

To begin addressing the skills gap, the Career Development Office (CDO) has created a structured career development program that will provide our trainees direct opportunities to acquire these high-demand skills. Together with the world-class discipline-specific research training programs at CU Denver/Anschutz, this program will help prepare our trainees to become well-rounded, highly-qualified candidates for a myriad of scientific professions. Although proficiency in these competencies is expected by the completion of a postdoctoral fellowship, it is appropriate to begin developing these competencies at the predoctoral level. As such, this program is designed to benefit both pre and postdoctoral trainees. The specific goals of this program have been adapted from the National Postdoctoral Association's Core Competencies for postdoctoral fellows*, and are outlined in detail below.

*The original core competencies can be found at http://www.nationalpostdoc.org/?SixCoreComps#iv.

GOAL 1: COMMUNICATION SKILLS.

The ability to effectively communicate is essential to be effective as a researcher; however, these skills are often not explicitly addressed through the research process. As such, the CDO provides multiple venues and formats for pre and postdoctoral trainees to acquire knowledge about effective communication, and ample opportunities to acquire practical experience with effective communication. During the pre or postdoctoral training period, trainees should become proficient with the following items:

- *Writing:* e.g., Scientific publications; Grants/applications; Curriculum vitae, resume, and cover letters; Research and teaching statements or portfolio; and Letters of recommendation or collaboration.
- *Speaking:* e.g., Presenting research to scientific and lay audiences; Conference and seminar presentations, including posters and PowerPoint; Job interviews and job talks.
- *Teaching and Mentoring:* e.g., Teaching methods and pedagogy; Learning styles.

Goal 1: Communication Skills (continued)
- *Interpersonal Communication Skills:* e.g., Style, tone, and non-verbal cues; Negotiation (e.g., in difficult economic times, formal conversations with PIs/mentors about continued funding of the postdoc position); Performance reviews/feedback; Conflict resolution, including difficult conversations/minimizing conflict.
- *Special Situations:* e.g., Networking; Managing the news media.

GOAL 2: LEADERSHIP AND MANAGEMENT SKILLS

Leadership and management skills are critical for career success both inside and outside of academia. Indeed, leadership and the ability to effectively manage time, projects, budgets, and personnel is required to succeed as an academic independent investigator just as it is to succeed in a myriad of non-academic careers (e.g., industry, government, business, etc.). As such, the CDO provides workshops and seminars designed to formally address leadership and management skills. During the pre or postdoctoral training period, trainees should become proficient with the following items:
- *Personnel Management*: e.g., Recruiting, hiring, and terminating personnel; Mentoring and retaining personnel; Conducting performance reviews and providing feedback; Working with individuals of diverse backgrounds; Managing conflict/having difficult conversations.
- *Project Management*: e.g., Establishing priorities; Short and long-term planning; Time management; Establishing/maintaining effective collaborations; Developing/managing budgets; Tracking use of and ordering supplies and equipment; Recordkeeping in print and electronic media; establishing data backup protocols; Running a meeting; Delegating responsibilities.
- *Leadership Skills*: e.g., Identifying and clarifying goals; Motivating/inspiring others; Understanding the long-term strategic vision and helping others to see where their work/roles fit in this picture; Understanding how to use appropriate leadership styles in any given situation; Serving as a role model.

GOAL 3: PROFESSIONALISM

Professionalism is an expectation of many careers, but often is not formally discussed. Professionalism encompasses many different contexts, including, the laboratory, the University, the specific field of study, the societies that serve those disciplines, and in an online environment. In addition to the professionalism learned in the mentor's laboratory, the CDO provides workshops and seminars designed to formally discuss professionalism. During the pre or postdoctoral training period, trainees should become proficient with the following items:
- Assess and uphold workplace etiquette, performance standards, and project goals.
- Comply with rules, regulations, and institutional norms.
- Respect, evaluate, and enhance the intellectual contributions of others.
- Advance and promote the discipline by participating in public and professional service activities, such as professional societies, editorial and advisory boards, peer review panels, and institutional committees.

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Goal 3: Professionalism (continued)
- Advance and promote the discipline by participating in partnerships with government agencies, foundations, and/or nonprofit organizations, such as funding agency grant panels or other advocacy/advisory boards to contribute to the advancement and promotion of the discipline.
- Identify and manage apparent and actual conflicts of interest, ethical violations, and violations of expected professional behavior.
- Create and maintain a professional online presence.

Career Development Program Competency Proficiencies:

Successful participation in the CDO career development program will allow participants to gain proficiency in communication, leadership and management, and professionalism skills, which will be demonstrated by the following knowledge and abilities:

Communication skills:
- Ability to effectively communicate to diverse audiences in writing (e.g., writing for lay and technical audiences, CVs or resumes, cover letters, emails).
- Ability to effectively communicate to diverse audiences in speaking (e.g., speaking to lay and technical audiences, teaching, job interviews, job talks, negotiation).
- Understanding of effective interpersonal communication and demonstration of these abilities in diverse settings (e.g., understanding of different communication styles, conflict resolution, networking).

Leadership and Management skills:
- Ability to identify and clarify goals and to understand the long-term strategic vision, and an ability to help others to see where their work/roles fit in this picture.
- Understanding of how to use appropriate leadership styles in any given situation.
- Ability to mentor and to motivate others.
- Awareness of personality traits and how to use those effectively in varying situations.
- Ability to manage time and demonstrate short and long-term planning.
- Ability to develop and manage a budget.
- Ability to run a meeting, establish priorities, and delegate responsibilities.

Professionalism skills:
- Understanding of appropriate workplace etiquette and performance standards.
- Ability to comply with rules, regulations, and institutional norms.
- Ability to respect, evaluate, and enhance the intellectual contributions of others.
- Ability to be cultural-responsive and inclusive.
- Ability to advance and promote the discipline (e.g., by participating in public and professional service activities, partnering with government agencies, etc.).
- Ability to Identify and manage apparent and actual conflicts of interest, ethical violations, and violations of expected professional behavior.
- Ability to create and maintain a professional online presence.

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2. Monster.com (2011). United States biotechnology 2011 job candidates: Insights and analysis from professionals, recruiters and hiring managers. https://report.nih.gov/investigators_and_trainees/ACD_BWF/pdf/Monster_2011_Biotech_JobConditions.pdf
3. National Postdoctoral Association Core Competencies: http://www.nationalpostdoc.org/general/custom.asp?page=SixCoreComps#iv.