What Do You Need to Know to Be a Successful Physiologist?

Do you know how to hire (or fire) a technician?

Do you know how to teach effectively?

Can you evaluate data critically?

Can you develop and implement a budget?

Are you knowledgeable about statistical approaches and when to use them?

Can you communicate effectively when you write and speak?

Do you know where to look for funding opportunities?

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APS/ ACDP List of Professional Skills for Physiologists and Trainees

Published jointly by The American Physiological Society (APS) and Association of Chairs of Departments of Physiology (ACDP)

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APS Education Publication Number 2003-02
ISBN: 1-890252-01-1

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The Scientist as a Lifelong Learner

Training to be a scientist means training to be a lifelong learner. Scientific theories, knowledge, and research and teaching methodologies are constantly changing, reflecting the very nature of the scientific endeavor. Scientists must be open to and actively seek new knowledge in addition to new and better methods for acquiring that knowledge and for sharing it with the wider community. Therefore, scientists-in-training must not only seek to develop a high degree of skill in the current knowledge and methodology of their specific field, but they must also develop the motivation and skills to constantly update both. Ultimately, to be a scientist is to be a lifelong learner.

The lifelong learning process begins early in career development. The process becomes more focused as students select a science-related course of study during their undergraduate years. In a scientific career, formal training makes up a significant part of the individual's professional development. Coursework at the undergraduate and graduate levels builds both content knowledge and learning skills. It also develops and continuously improves laboratory, writing, and presentation skills, as well as the ability to work more independently. The postdoctoral experience allows trainees to acquire new skills, such as proposal development and/ or project management, and to further improve existing skills. Even when trainees move into their first professional position, the learning process continues, often with a greater focus than previously on editing and writing, teaching (teaching methods, curriculum development, and assessment skills), administration, management, and supervision. Scientists also develop skills enabling interaction with and meaningful contribution to the broader scientific community, not only within their host institutions, but also nationally and internationally. The learning skills that scientists develop during undergraduate, graduate, and postdoctoral training allow them to adeptly add new knowledge and new skills to their repertoire at each career phase.

It is important to recognize that many of the trainee's learning experiences do not occur within the context of formal coursework or training programs. As trainees progress from undergraduate to graduate to postdoctoral stages, training evolves into a more individualized program. Students mainly benefit from learning opportunities provided by their institutional departments and their advisors. However, successful students also seek opportunities to achieve professional development goals that they have set for themselves. Just as a career in science requires ongoing self-motivated learning, success in training to become a scientist requires students to take a very proactive approach, seeking opportunities to learn skills important to their future work.

What should those personal professional development goals entail? This depends upon the individual's career goals. In the field of physiology, an advanced degree can lead not only to more traditional careers, such as those involving research and/ or teaching in academia, but also to careers in industry research and management, government research and policy, public understanding of science, and consulting in areas such as law and writing. Planning a career in any of these areas requires students to consider which skills and experiences will best prepare them for success. There are, however, many important skills that are needed across many areas of scientific work.

A List of Professional Skills for Physiology Trainees

In 2002, The American Physiological Society and the Association of Chairs of Departments of Physiology began compiling a list of important professional development skills for physiology trainees. The development process for the list is provided in Appendix A. The list that follows is the product of that process. It is important to note that the list was developed with specific purposes in mind. **The primary purpose of this list is to serve as a professional development tool for physiology trainees and their mentors.** For example, trainees may use the list to help plan their professional development in terms of both formal and informal training opportunities. Mentors and trainees may use the **list** as a focus for their discussions on career planning and professional activities. Some mentors, and even some departments, may use the **list** as a discussion document when planning and/ or revising their graduate programs and/ or postdoctoral fellowship activities. In sum, the **list** is primarily designed as a tool for physiology trainees to use in their personal career planning.

It is important to note that the document was NOT designed for some other purposes. **This document was not designed to serve as a list of standards for graduate or postdoctoral training.** In the process of becoming a physiologist, some, but not all, learning experiences are provided by graduate departments and postdoctoral employment. Others must be sought individually and customized to the specific needs of the trainee. This list describes the skills developed through both formal and informal learning experiences and, therefore, does not constitute a set of standards for graduate programs or postdoctoral fellowships.

Second, **it does not represent a "one-size-fits-all" checklist for professional development**. This list was developed with the wide variety of career areas that trained physiologists enter in mind. These include positions in academia, government, industry, not-for-profit organizations, and private consulting. Depending on the specific career goal, trainees may need to further develop their skills in research, teaching, administration and management, communications, business, law, information technology, or other areas. Trainees should consider what their personal career goals are and ask mentors who work in those areas about the types of skills that are particularly important to develop. However, it should be noted that, for most professional positions, some proficiency in all of these areas would be of value. For example, even those who do not teach formal courses will use teaching skills in seminars, coaching employees, and developing audio-visual materials for presentations and publications.

Finally, **it does not provide a detailed list of the core biomedical science knowledge or laboratory techniques needed for a successful research career in physiology**. These differ by the specific academic department and, of course, by the specific research field and topics selected. These are, however, important topics that trainees should discuss with their mentors and departmental advisors.

Document Organization
The list of professional skills is divided into major skills categories. At the beginning of each category is a description of the overall category along with suggestions of career fields where these skills are especially important. The nine major categories are:

1. *Core Biomedical Science Knowledge*
2. *Professional Ethics*
3. *Laboratory-Related Skills*
4. *Research/ Analytical Skills*
5. *Communication Skills*
6. *Teaching and Mentoring Skills*
7. *Personnel and Management Skills*
8. *Lifelong Learning Skills*
9. *Career Development Skills*

The categories are not listed in order of importance nor are the skills listed in chronological order (that is, graduate vs. postdoctoral skills). However, those skills considered by APS and ACDP to be most likely developed after the graduate years are highlighted with an asterisk (*).

Across categories, there are redundancies in the specific skills listed. For example, knowing how to organize ideas in a useful manner is cited as an important skill in both "Technical Writing" and "Presentations" in the *Communications Skills* category. Similarly, skill in conceptualizing specific problems is listed under both "Problem-Solving/ Reasoning" and "Experimental Design" in the *Research/ Analytic Skills* category. This type of redundancy is intentional and is designed to help the trainee recognize that some skills are important to more than one area of professional activity.

Finally, APS and ACDP have elected to include a section on interacting with professional societies (see section 9B). Science is a collaborative and interactive endeavor, whether one is engaged in research, teaching, writing, or administration. The resources and opportunities for such collaborative and interactive activities as provided by scientific professional societies are numerous, ranging from publishing and meeting presentations to serving as reviewers, editors, committee members, and officers. Most scientists would agree that these activities make a strong positive contribution to their professional development.

A Word of Encouragement

At each stage of life, we are faced with new challenges and opportunities to learn and grow. Graduate and postdoctoral training in physiology offer a chance not only to learn a profession but also to play a role in exploring the processes of life itself. When a college freshman views a list of the courses required for a degree in biology, the **list** is broken down by year and/ or semester to provide a sequential list of objectives to achieve on the way to earning the bachelors degree. There is a similar structure to the beginning of graduate study but, progressively, the training moves toward a much more individualized and customized program. The exciting part is that the student has increasing input into the direction of his/ her studies and activities. However, this requires progressively more planning and reflection on the part of the student and increased discussion between the student and his/ her mentor(s) and advisor(s). This document is not a road map like the one handed out at freshman orientation. It is not meant to intimidate the new graduate student. Just as the list of courses required for the bachelors degree looked intimidating on the first day of the freshman year, the list of skills to be developed over several years of graduate and postdoctoral training and during the first professional position may seem daunting. Yet, like completing those numerous undergraduate courses, these skills are acquired and developed progressively, with new opportunities to learn and refine additional skills during each year of training. They serve to highlight the many areas of expertise a trained physiologist will have in the future.

1. Core Biomedical Science Knowledge

Graduate students in physiology, as in most areas of science, face the task of becoming both experts and generalists in their field. They must become experts in their specific subfield of physiology, with detailed knowledge of the historical and current research, theories, and methodologies. However, they also must have a broad working knowledge of physiology, from the molecular to the systems levels in order to understand their specific field in the overall context of living systems. This **list** of professional skills does not attempt to detail either the broad or specific concepts needed by the individual student. It is up to the trainee, his/ her advisor, and the department to determine what that detailed and broad knowledge should entail at each stage of training. *Both a broad knowledge of physiology and the skills necessary to develop expertise in a specific content area are important for most physiology-related careers.*

Major Skills	A Trainee will understand the importance of and work to develop
A. Core biomedical science knowledge	a. Broad working knowledge of molecular, cellular, and systems physiology b. Detailed knowledge of specific area of research

2. Professional Ethics

Professional ethics is integrated into all areas of training, but often it is not taught explicitly as a separate topic. However, the importance of developing professional ethics in any career cannot be overemphasized. The physiologist who does not develop the professional attitudes and behaviors recognized as the norms for his/ her profession and who does not adhere to the mandated protocols for use of living organisms and handling of data and information will find it difficult to be successful in the long term. *Development of and adherence to professional ethics is vital to professionals in all fields.*

Major Skills	A Trainee will understand the importance of and work to develop
A. Professional attitudes	a. Awareness of responsibility as a scientist b. Awareness of the ethical implications of one's area of research *c. Understanding of public affairs and how it relates to research
B. Professional behavior	a. Knowledge of and adherence to professional societies' codes of ethics b. Recognition and acknowledgment of potential conflicts of interest *c. Understanding of appropriate steps or procedures for dealing with conflicts of interest *d. Recognition of the need to compensate employees fairly - financially and by acknowledgement of their scientific contributions e. Understanding of and respect for intellectual property rights f. Understanding the need to ensure integrity of own publications and communications g. Knowledge of what constitutes fair use of copyrighted material
C. Use of human/ animal subjects	a. Knowledge of appropriate use of human/ animal subjects b. Knowledge of proper treatment of human/ animal subjects *c. Knowledge of how human use and animal care committees work d. Knowledge of proper protocols
D. Confidentiality	a. Knowledge of role of confidentiality in human research b. Understanding of role of confidentiality in dealing with individuals

*Items with asterisks indicate skills that students would be more likely to develop after their graduate training.

3. Laboratory-Related Skills

The laboratory materials, equipment, and protocols used by physiologists change regularly as new methods are developed and new safety and procedural regulations are mandated. Furthermore, scientists often cannot predict where a particular research question will lead them. A molecular question may well lead to whole organ experiments and vice versa. As a trainee, it is important to take every opportunity to learn diverse methods, as well as developing expertise in the primary methods used in one's own field. This includes understanding what is involved in using animals or humans in research, as well as the safe handling of radioactive and other hazardous materials. Finally, it is critical to learn early in one's training how to maintain accurate records, logs, and protocols. *While laboratory skills are obviously important for the physiologist primarily involved in research, they are also critical to those engaged in teaching courses that include a laboratory component.*

Major Skills	**A Trainee will understand the importance of and work to develop**
A. Laboratory-related skills	a. Knowledge of guidelines and institutional certification in human experimentation, animal experimentation, and laboratory safety, including use and disposal of radioactive and hazardous materials b. Knowledge of operation and maintenance of basic lab instrumentation, including reliability and limitations c. Knowledge of sound laboratory practice and ability to maintain records, logs, and protocols d. Skill in handling of experimental animals and working with human subjects e. Skill in making measurements from living systems

*Items with asterisks indicate skills that students would be more likely to develop after their graduate training.

4. Research/Analytical Skills

This is another area that is vital to any career and, in truth, to daily life. Problem-solving and planning skills, as well as literature skills, can be utilized regardless of the type of work in which the physiologist is engaged. Time and resource management are crucial to life at work and home. Skills in experimental design, while of most necessity to the scientific researcher, also can be useful in other careers, and information technology skills must be constantly upgraded in all professional fields. Many of the skills in this section are often categorized as critical thinking skills, underscoring their generality and applicability to many fields of endeavor. *Research and analytical skills are important for physiologists working in all career areas.*

Major Skills	**A Trainee will understand the importance of and work to develop**
A. Problem solving/ reasoning	a. Ability to conceptualize problems b. Ability to brainstorm (and question) ideas in a group c. Ability to combine and integrate information from disparate sources d. Ability to break down and understand complex content e. Ability to solve problems by staying current and up-to-date in new technologies f. Ability to use troubleshooting skills g. Ability to identify irregular results h. Ability to evaluate hypotheses and data critically i. Ability to reach and defend independent conclusions j. Knowledge of appropriate qualitative approaches to research problems k. Ability to express a problem or solution using quantitative approaches l. Ability to generate multiple solutions m. Ability to develop creative solutions (divergent thinking) n. Ability to support a position or viewpoint with argumentation and logic o. Ability to interpret data validly
B. Planning	a. Ability to prioritize tasks b. Ability to identify needed resources *c. Knowledge of how to implement and manage all phases of complex research projects and follow them through to completion *d. Knowledge of how to develop and implement a budget

*Items with asterisks indicate skills that students would be more likely to develop after their graduate training.

4. Research/Analytical Skills (cont'd)

C. Experimental design	a. Knowledge of the scientific method to organize and test ideas and hypotheses b. Ability to recognize meaningful problems and questions for research c. Ability to define the problem precisely d. Knowledge of different research methodologies e. Ability to select appropriate instruments to acquire data f. Skill in designing experimental protocols, including appropriate use and number of experimental subjects g. Understanding of the principles and procedures for institutional approval for use of animal/ human subjects h. Skill in evaluating experimental evidence i. Ability to draw conclusions from data (data analysis)
D. Informational technology	a. Skill with computers, both software (word processing, spreadsheets, databases, Internet, email) and basic equipment setup b. Ability to select appropriate graphical methods and appropriate use of graphical representations c. Proficiency in information storage and retrieval d. Knowledge of and ability to use large information databases, including ability to search databases effectively
E. Data analysis	a. Knowledge of and ability to select appropriate statistical approaches b. Ability to determine accuracy of computed results
F. Time management	a. Organizational skills b. Ability to prioritize tasks and troubleshoot *c. Ability to plan a project timeline *d. Knowledge of how to track projects
G. Resource management	*a. Ability to organize resources for projects b. Knowledge of how to maintain equipment/ work area c. Knowledge of inventory and supply maintenance *d. Knowledge of personnel management (see section 7) *e. Ability to manage contracts and negotiate with outside vendors
H. Scientific literature	a. Familiarity with the research literature of physiology, including familiarity with major historical developments b. Ability to read the primary literature c. Ability to keep abreast of major research developments both within a particular research area and in the general area of physiology d. Ability to locate and assimilate new information rapidly

*Items with asterisks indicate skills that students would be more likely to develop after their graduate training.

5. Communication Skills

Good communication skills are required regardless of what career path is chosen, scientific or not. Every person needs to know how to express him/ herself in speaking and writing. Whether presenting a symposium, coaching an employee, being interviewed for a job, or simply talking with a neighbor or colleague, being able to communicate clearly is critical. Being able to express ideas clearly and succinctly in writing also is essential whether it is in a grant proposal, job application cover letter, or letter to the editor. The researcher, for example, may have made a landmark discovery, but the work never "speaks for itself." It requires good written and oral communication skills to share findings with the wider scientific community. As with most skills, communication skills develop through practice. *Communication skills are the hallmark of professionals in all fields, including all areas of physiology.*

Major Skills	**A Trainee will understand the importance of and work to develop**
A. Interviewing (Interviewee)	a. Skill in preparing for diverse types of interviews b. Knowledge of how to conduct oneself at interviews c. Knowledge of appropriate post-interview actions
B. Presentations	a. Ability to organize ideas in a useful fashion b. Ability to use graphics effectively to communicate ideas c. Knowledge of how to develop poster presentations d. Knowledge of how to develop various types of oral presentations e. Ability to convey complex information in appropriate fashion to audiences with different levels of physiology knowledge f. Ability to speak before large and small groups g. Ability to assess audience response to determine how well ideas are being conveyed h. Ability to make persuasive arguments in oral presentations i. Ability to handle audience questions j. Ability to speak clearly in English
C. Technical writing	a. Ability to organize ideas in a useful fashion b. Ability to write logical instructions c. Ability to write at all levels: brief abstracts to book-length manuscripts d. Ability to use graphics effectively to communicate ideas e. Ability to revise one's own work to make a document or presentation clearer or more persuasive f. Ability to edit and proofread g. Knowledge of publication process for scientific journals and other publications h. Ability to cite and critically analyze the scientific literature in written work i. Ability to convey complex information in appropriate fashion to audiences with different levels of physiology knowledge

*Items with asterisks indicate skills that students would be more likely to develop after their graduate training.

5. Communication Skills (cont'd)

D. Grant writing	*a. Knowledge of how to identify various funding sources *b. Knowledge of types of grants and different approaches to writing them c. Ability to develop clear and testable hypothesis, objectives, and research plan *d. Proficiency in developing grant budgets *e. Knowledge of submission and evaluation processes *f. Knowledge of grant review processes g. Ability to use scientific literature effectively in writing grant proposals
E. Peer Review	a. Ability to give and receive appropriate constructive criticism in writing and evaluating manuscripts and other types of writings b. Ability to give and receive appropriate constructive criticism in giving and evaluating oral and poster presentations *c. Ability to give and receive appropriate constructive criticism in writing and evaluating grant applications

*Items with asterisks indicate skills that students would be more likely to develop after their graduate training.

6. Teaching and Mentoring Skills

Teaching skills are another example of skills that everyone, regardless of career choice, can use. While those trainees planning on a teaching career should hone their teaching skills to the highest level, most professionals have need of teaching skills, either in the workplace or at home. Because institutions greatly vary as to whether graduate students are provided with opportunities to teach, the following items under "A. Teaching" may be developed either as a graduate student, postdoctoral fellow, or later.

Mentoring is a skill that graduate students begin practicing almost immediately, both seeking advice from those ahead and giving advice to those following behind. Knowing how to be a good mentee and mentor is invaluable at all stages of a career. *Teaching and mentoring are both important for physiologists working in all career areas.*

Major Skills	**A Trainee will understand the importance of and work to develop**
A. Teaching	a. Effective classroom teaching to varied audiences in terms of subject matter b. Effective classroom teaching in terms of pedagogy c. Ability to convey the competence in subject matter and confidence in one's ability to teach d. Ability to develop course curriculum and individual lessons e. Effective use of common instructional aids, including audiovisual techniques f. Ability to help students understand the general principles and concepts underlying a particular lesson g. Ability to explain both basic and difficult concepts clearly h. Ability to put a specific lesson into larger context (clinical relevance, prior material) i. Ability to ask good questions (testing, study, case histories) j. Ability to provide feedback to students k. Awareness of the strengths and limitations of various means for evaluating teaching performance l. Ability to adjust lesson plan based on info garnered from student questions m. Ability to foster an effective learning environment including showing respect for the student, encouraging their intellectual growth and providing a role model for scholarship and intellectual vigor

6. Teaching and Mentoring Skills (cont'd)

B. Mentoring	<u>Skills for being a mentor:</u> *a. Knowledge of the role(s) mentors can play at various career stages *b. Ability to evaluate someone's strengths and weaknesses, and help guide them to build on strengths, improve on weaknesses *c. Knowledge of how to provide feedback, constructive criticism, and advice *d. Knowledge of how to listen to someone to understand their perspective on their own situation *e. Knowledge of the rules and procedures related to mentee's situation – e.g., as a student, postdoctoral fellow, or junior colleague *f. Knowledge of the job market and the opportunities therein
B. Mentoring (cont'd)	<u>Skills for utilizing a mentor:</u> a. Knowledge of the role(s) mentors can play at all career stages b. Knowledge of how to select a good mentor c. Knowledge of when to approach mentor for advice, guidance, or advocacy d. Knowledge of how to develop a good relationship with a mentor e. Ability to articulate one's individual needs, desires, concerns, and limitations with regard to one's own career development f. Knowledge of what to do when one disagrees with a mentor g. Knowledge of how to listen to someone to understand their perspective on their own situation

*Items with asterisks indicate skills that students would be more likely to develop after their graduate training.

7. Personnel and Management Skills

While personnel and management skills may not be an area of primary importance to graduate students (although some may be given partial supervision of undergraduates or technicians), it becomes increasingly important as one's career progresses. Regardless of the type of career chosen, personnel and management skills are essential, requiring understanding of both supervisory strategies and personnel procedures. The importance of networking for staying current in one's field and for future development and of teamwork cannot be overstated. *Personnel, management, and teamwork skills are important to physiology professionals in all fields.*

Major Skills	**A Trainee will understand the importance of and work to develop**
A. Supervising staff and other employees	*a. Awareness of basic human resources procedures/ laws *b. Recognition of the need to compensate employees fairly - financially and by acknowledgement of their scientific contributions c. Listening skills *d. Advocacy skills e. Ability to explain goals, objectives, guidelines f. Sensitivity to different perspectives and cultures *g. Knowledge of how to cope with and manage complicated personalities *h. Ability to motivate staff *i. Knowledge of how to conduct an interview *j. Knowledge of how to run effective team meetings *k. Knowledge of how to develop fair performance evaluations, including ongoing feedback *l. Knowledge of conflict resolution *m. Ability to write accurate and professional recommendation letters
B. Management of projects/ grants	*a. Knowledge and adherence to professional societies' codes of ethics *b. Understanding of importance of ensuring integrity of own publications and communications *c. Ability to navigate complex bureaucratic environments *d. Skills in time management (assigning priorities and delegating) *e. Ability to develop and implement a budget *f. Ability to manage a team *g. Knowledge of how to create a cooperative work environment
C. Networking	a. Knowledge of how to develop a base for possible collaborations b. Knowledge of how to contact other researchers at meetings c. Knowledge of how to contact with other researchers via email
D. Working in teams	a. Ability to work well with many different people/ cultures b. Respect for and placing value on different perspectives c. Ability to provide and respond to constructive criticism d. Ability to work well under pressure and willingness to work hard e. Ability to apply oneself to a variety of tasks simultaneously f. Knowledge of how to work with the committee process

*Items with asterisks indicate skills that students would be more likely to develop after their graduate training.

8. Lifelong Learning Skills

As noted earlier, to be a scientist is to be a lifelong learner. Regardless of position or status, learning must continue in all areas included in this document to ensure continued competency. *Lifelong learning skills are valuable for physiologists working in all areas.*

Major Skills	A Trainee will understand the importance of and work to develop
A. Lifelong learning	a. Awareness of various career opportunities available b. Awareness of contemporary issues in physiology c. Willingness to examine, adapt, and adopt practices, methods, and ideas from perspectives very different from your own d. Commitment to continuously upgrading one's education e. Skills associated with independent learning f. Self-skills (self-motivation, self-confidence)

9. Career Development Skills

Initially, career planning may be perceived as a skill solely for graduate students. However, scientists at all levels must engage in career planning. Opportunities can arise very unexpectedly and the successful physiologist is prepared to take advantage of them. A current example is entrepreneurial skills. Whereas once they were not viewed as important, for many of today's physiologists they are fundamental, critical to the success of their overall research or development program. Professional societies offer scientists an important venue for developing and honing many professional skills and for exploring possible avenues for career development. *Professionals in all fields must afford time to career planning.*

Major Skills	A Trainee will understand the importance of and work to develop
A. Career planning	a. Periodic self-assessment of one's skills and interest b. Knowledge of diverse career options and current/ future job markets c. Ability to investigate necessary skills/ knowledge for particular careers d. Ability to adapt to a changing environment e. Willingness to examine, adapt, and adopt practices, methods, and ideas from perspectives very different from one's own f. Ability to identify and seek advice from a mentor(s) g. Understanding of expectations for current position and/ or for job advancement
B. Interacting with professional societies	a. Understand the benefits of belonging to and participating in a professional society b. Knowledge of appropriate societies to select for membership c. Understanding how to get the most benefit from attending scientific meetings d. Skill in presenting one's research *e. Knowledge of committees and selection process *f. Skill in doing editorial work (Reviewing manuscripts) *g. Ability to organize symposia/ conferences
C. Entrepreneurial skills	a. Knowledge of intellectual property rights *b. Recognition and acknowledgment of potential conflicts of interest *c. Understanding of appropriate steps/ procedures for dealing with conflicts of interest *d. Knowledge of patents process *e. Skills in negotiating

*Items with asterisks indicate skills that students would be more likely to develop after their graduate training.

APPENDIX A: Development Process for the Skills List

In July 2002, the APS Council charged the APS Education, Career Opportunities in Physiology, and Women in Physiology Committees to consider the development of a graduate skills document and an associated timeline for its production based on a request by an APS member. The three Chairs, Robert G. Carroll (Co-Chair; Education Com.), Francis L. Belloni (Career Com.), and Carole M. Liedtke (Women's Com.) drafted a proposal and timeline and presented it to the APS Council at its November 2002 meeting. Council accepted the proposal and asked that the concept be presented to the Association of Chairs of Departments of Physiology (ACDP) at its December 2002 meeting for its consideration and possible involvement in the project. The proposal was accepted by the ACDP and three representatives were chosen to represent the group in the initial development of the document. They were William H. Dantzler (Co-Chair), Vernon S. Bishop, and William S. Spielman.

The group examined available online documents of a similar nature as developed by other societies, organizations, universities, and departments.[1] From that list, the major topics were pared down to nine. The group then examined entries other documents contained for each topic, accepted some, edited others, and added items specific for physiology. After several iterations, a draft table of skills for professional development was completed.

The draft table was then presented to the members of the three APS committees and the ACDP Council for feedback. Conference calls were held with each group. Suggested changes were compiled into a single document for the six-member committee to consider. A narrative to accompany the table was drafted, as were individual narratives for each of the nine sections. The committee then reviewed the narrative, the section narratives, and the suggested revisions made by the four groups. A final draft version resulted, which was then submitted to the APS Council at its summer 2003 meeting and to the ACDP Council. With their approval, it was then made available to the APS and ACDP membership for comments. The document was revised based on those comments. A final document was agreed upon and presented for approval to the ACDP at its December 2003 meeting and to the APS Council in January 2004.

The APS/ ACDP List of Professional Skills for Physiologists and Trainees was printed and distributed to all the physiology departments in North America. It was also made into .pdf and HTML files for posting on both the APS and ACDP web sites, with links to relevant material for each section and skill. The list is available to both members and non-members.

[1]Sources used as starting points for document:

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9. Woodrow Wilson National Fellowship Foundation. Responsive PhD agenda: *New Paradigms New Practices*. *New People*. 2002. (http://www.woodrow.org/responsivephd/agenda.html)