Cardiovascular Early Careers
Past and Present

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This article examines the pathway of those pursuing early careers in the cardiovascular sciences, both past and present, highlighting new challenges and the roadblocks they present. This article emphasizes the need for multitasking in today’s academic environment and provides information about career training opportunities offered by the American Heart Association.

During the past 10 years in academia, we have heard terms like early career and early-stage investigator with increasing frequency. During my doctoral work and postdoctoral training in the early 2000s, career stage, or status, was less concerning to bench scientists. Now, however, the scientific community has come to the consensus that systematic training is integral to doctoral and postdoctoral studies, as students and fellows try to balance the requirements of their discipline with the exigencies of modern-day scientific professionalism. According to the National Institutes of Health, an early-stage investigator is defined as “those who are within 10 years of completing his/her terminal research degree or … within 10 years of completing medical residency (or the equivalent).” After the introduction of policies designed to assist early-stage investigators who are competing for funding with more established investigators, the number of competing R01 awards offered to those meeting that definition has steadily increased. In addition, special scoring consideration has been afforded to this group, along with enhanced emphasis on their proposed research projects. In fact, discussions geared toward supporting early-career researchers are hinting that steps should be taken to restructure the review process to counteract potential biases that exist in favor of tenured faculty members. By the time early-career investigators have served their time at the assistant professor level, they will have already performed as true yeomen by bringing new fundable projects over time to the development of proprietary products and technologies or patents. At the same time, classroom teaching is also expected, and although newly tenured faculty may have been teaching assistants or mentors in the past, few have actually been exposed to didactic teaching. As Chair of the Basic Cardiovascular Sciences Early Career Committee, I am privileged to write this article about the extensive training opportunities provided to early-careerists by the American Heart Association (AHA). Early-careerists are the innovators who will bring new ideas and technologies to the fight against cardiovascular disease. Compared with the National Institutes of Health, which has had a long history of giving special grants to early-careerists, the AHA has elevated this support by providing stratified research funding programs that emphasize training at various career stages. In this context, the following article aims to provide an overview of the status of early-career scientists and highlight specific activities that might be undertaken by the AHA to promote those at the early-career stage.

Science Is Becoming Increasingly More Business-Like These Days

A common characteristic of business is competition for start-up and continuing sources of capital. These days, scientists, too, must compete for startup, intra- and extramural funding to support salary, conduct research, support students and trainees, attend conferences, and publish. Beyond this, even more funding is needed to advance individual projects to the next level. Acquisition of funding is the keystone of competitiveness for the contemporary scientist. This tendency leads academic institutions to consider the marketability of scientists, almost ahead of their research goals and accomplishments. However, training under the old standards has not given newly independent scientists these tools, which means that self- and career marketing, as well as branding in the sense of establishing signature research work, is largely self-taught. New hires can be considered an institutional investment in that their fundable projects over time can lead to the development of proprietary products and technologies or patents. At the same time, classroom teaching is also expected, and although newly tenured faculty may have been teaching assistants or mentors in the past, few have actually been exposed to didactic teaching. As Chair of the Basic Cardiovascular Sciences Early Career Committee, I am privileged to write this article about the extensive training opportunities provided to early-careerists by the American Heart Association (AHA). Early-careerists are the innovators who will bring new ideas and technologies to the fight against cardiovascular disease. Compared with the National Institutes of Health, which has had a long history of giving special grants to early-careerists, the AHA has elevated this support by providing stratified research funding programs that emphasize training at various career stages. In this context, the following article aims to provide an overview of the status of early-career scientists and highlight specific activities that might be undertaken by the AHA to promote those at the early-career stage.
practice of bench science is simply not enough to justify a place in the academic hierarchy.

**Early Careerists Likened to Mahākāli: The Hindu Goddess of Time and Death**

Hindu tradition speaks of an adversary to mankind, Raktabija (blood-seed), a terrible demon who threatened mortals. In response, all the deities combined their diverse and divine energies to produce a super being named Kali who was powerful enough to destroy the demon. Thus, the concept of the Great Kali, or Mahākāli (Sanskrit), a prominent Hindu Goddess endowed with the force of anger, was the culmination of divine synergy. Kali is considered the symbol of divine motherhood and embodies energy, creativity, and productivity. Seated astride a lion or tiger, the great strength of Kali is symbolized by her 10 arms, each brandishing a weapon, while engaged in battle. This fable can serve as a metaphor for scientists in academia today who must first develop the power to survive and then harness the power to succeed. As suggested in the previous section, proficiency in bench science is no longer a sufficient measure of success in today’s academic arena. So, what are the powers required to survive in academia today? First, one needs to cultivate a big idea, possibly one that will blossom into the coveted long-term signature research, and then set and meet goals to realize that idea. On a personal level, self-mastery allows one to harness one’s intellect and channel it toward achieving goals, one step at a time. The ascent to independence is characterized by the power of vision, deciding which questions are still unanswered and which problems are still unresolved and then applying one’s own talent and skills to finding the answers and solving the problems. More simply stated, the ability to establish a niche area within a particular discipline will pave the way toward significant contributions, thus creating a unique place among more established peers. Similar to the Great Kali’s energy, creativity and productivity toward vanquishing the demon, successful completion of these steps will require persistence, tremendous personal and professional growth and substantial planning. These costs will be rewarded with true recognition as an independent scientist in academia. However, before these significant milestones are reached, as indicated in the Figure, early careerists must lay the foundation. Accordingly, as a post doc, it is critical to absorb accumulated literature of the respective discipline. This is also the time to perfect communication and computer skills; learn the art of grantsmanship; develop necessary supervisory and time management strategies; hone networking skills; and establish personal and professional collaborations. Cheerful acceptance of criticism is part and parcel of this process, as is unflinching self-improvement. Today, therefore, systematic training for early careerists must integrate these tenets into regular study programs, relying on such organizations as the AHA for additional support.

![Figure](image.png)

**Figure.** Early careerists have the power to make their own future. Early careerists are the driving force of basic, biomedical, and medical research. They are the future foundation of our scientific society. They have more opportunities today than in the past to be recognized, respected, and excel in their chosen paths. However, unlike the Great Kali with 10 arms of power, early careerists must have more arms, as shown in the figure, and learn to take advantage of all the opportunities available to them. Academic institutions, the National Institutes of Health, American Heart Association (AHA), and other scientific organizations either directly provide or can recommend resources for systematic training on the survival skills needed in today's scientific environment at the institutional level.
AHA Activities to Promote Early Careers: The Opportunities

The AHA has a deep and longstanding interest in early-career training and research funding, and it has been able to nurture successful research programs and assist in launching many early careers. Without a doubt, the AHA has been a pioneer in promoting early careers and providing specialized training instrumental to the success of many well-established investigators. The AHA provides funding opportunities for summer students at the undergraduate level, as well as fellowships for predoctoral students and postdoctoral trainees. In addition, the AHA offers scientist development grants to applicants at both fellow and faculty levels, as well as grants-in-aid to early independent investigators. Applying for funding gives students and fellows excellent training in grantmanship, and successful funding promotes their career development. Recalling the early part of this article, the AHA also understands the need to provide what could be termed survival training, which extends beyond basic bench research. This training addresses such topics as collaboration, networking, teaching, publishing, institutional service, and more. Developing these diverse skills can be likened to the 10 arms of the Great Kali, in the sense of increasing personal marketability. Every year at the AHA Scientific Sessions in November, the opening day has been dedicated to early careerists by organizing workshops, group activities, and symposia, as well as encouraging early careerists to meet and greet established investigators.

Specifically, early career committees have been formed within each council, with ≈10 to 15 members, including senior advisors. These committees address the needs articulated by early scientists and provide resources for early-career training. Within the committee, opportunities abound to lead activities, serve as a volunteer, and coordinate with other councils to jointly organize the November sessions. For example, Basic Cardiovascular Sciences and Arteriosclerosis, Thrombosis, and Vascular Biology have jointly organized sessions dedicated to early-career training, including such topics as grant writing, publishing, and alternative career opportunities. Serving on these committees provides experience and promotes the members’ skills so that they can be readied for the next level of service. One can serve on AHA study sections, which provide hands-on training in successful project development and effective grant writing strategies. The AHA journals through their respective editorial boards provide opportunities to expand skills in communicating scientific findings to peers. Local AHA activities provide other opportunities to get involved, reach out to local communities, and work toward improving the health and well-being of others.

The Future Is Bright for the Early Careerist

Early careerists are valued nowadays, as the scientific community and the AHA continue to look for ways to protect them during their development toward independence. We expect early careerists to challenge old beliefs, infuse their fields with fresh ideas, and forge new solutions to old problems in biomedicine. Early careerists have a wealth of resources at their disposal, new technological platforms, and modern communication networks that promote collaboration around the world. The development of that big idea, as mentioned earlier, will be a reality if it is given a chance to flourish and be cultivated by systematic training, along with tried-and-true mentorship. Early careerists are in the driver’s seat with the controls needed for their self-determination. For the Great Kali, 10 arms were sufficient, whereas young scientists may need more than 10 arms to perform the required multitasking and management skills to meet the demands of today’s academic environment. The opportunities are out there for those who want to teach, carry out research, work for pharmaceutical companies, or become entrepreneurs. Mentors are more than willing to assist in such pursuits, and the AHA will continue to provide resources to support these endeavors. This is truly an exciting time to be a scientist at any career stage, and it is inspiring to think of all that can be accomplished by early-career scientists in the coming decades.

More information about the AHA early career committees and career development sessions can be found at https://professional.heart.org/bcvsearlycareer. I am always available to answer any concerns or questions.

Disclosures

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