The cyberinfrastructure is an important (and expensive) resource that has the potential to revolutionize scientific research in nearly all fields. However, in the biological sciences, cyberinfrastructure resources are chronically underused, and even the most basic concepts of its operation are often misunderstood. These barriers limit the effective exploitation of this unique resource, and overcoming them will increase the pace of discovery and foster the development of new research methodologies. This application proposes the development of a cyberinfrastructure-focused education and training program in the specific area of quantitative biological sciences. The proposed Program involves the coordinated efforts from at least eight identified institutions and businesses under the direction of an experienced team at the two leading institutions – Weill Medical College of Cornell University and the Sloan-Kettering Institute. It includes the development of an innovative series of workshops designed for hands-on education of a diverse cohort of participants in the design, building and deployment of existing cyberinfrastructure resources for use in bioinformatics, computational biology and systems biology research and education environments, and how to make the most efficient use of such resources in those endeavors. The 15 comprehensive workshops to be developed under this Program will increase awareness and understanding, and ultimately utilization of the cyberinfrastructure in the growing disciplines of quantitative biology where the research community is seeking a new type of workforce, educated in the sciences and mathematics and armed with the most advanced computational tools. The team members assembled for this proposal have a strong and demonstrated commitment to formal graduate and undergraduate education and training. They have a comprehensive administrative plan that includes executive leadership groups, a technical review group, specialized advisory groups and a comprehensive evaluation plan to assess the effectiveness of the developed courses as learning tools, the breadth of their dissemination, and the impact of the Program on career choice of participants. The proposed Program includes an extensive dissemination element that is integral to its activities in all phases and aspects, from design of curriculum to planning the educational modalities, and from the selection of the education team to the design of content for remote use. These considerations are aimed at ensuring the broadest impact to the targeted researchers who are involved in learning to use, build and expand the CI. The dissemination plan spans multiple scales of distribution, including: (1) workshops held at the application’s institutions (also attended remotely by leveraging videoconferencing and remote computing capabilities); (2) correspondence-based workshops where participants download course modules (including worked examples and videos of lectures) and e-mail instructors with questions; (3) self-contained, fully searchable workshops downloadable from the web or packaged as DVD and print material, suitable for self-study or integration into the educational programs of other institutions. The workshops developed in this proposal are targeted at all levels of education, including undergraduates, to ensure the timely development of a cyberinfrastructure-savvy workforce. Another key aim of the Program is to inspire, attract and retain traditionally underrepresented groups to the endeavors of cyberinfrastructure development. This will be achieved by the specific plans for (1) the creation of summer workshops for talented underrepresented minorities enrolled in selected undergraduate programs in the New York metropolitan area; (2) the dissemination of appropriate versions of the developed course material to schools, including specifically targeting those nationally recognized as having diverse student bodies; (3) the inclusion of many female instructors to serve as role models to workshop attendees.