

Graduate Program in Chemical Engineering Separations

ABSTRACT

This proposal requests fellowships for nine U.S. graduate students with outstanding ability and financial need, so that they are able to pursue PhD degrees in Chemical Engineering at the University of Colorado, Boulder. An additional three fellowships will be provided through new institutional matching funds. The Fellows will be trained in chemical engineering principles and practices so that they are prepared for teaching and research careers which address critical national needs in *biological, chemical, and environmental separations* problems.

The proposal is a revision of a previous GAANN proposal with strong reviews (92/100 average score and 9/83 ranking in its group). Key changes made include (i) stronger recruitment and retention plan for talented students from underrepresented groups, (ii) improved mechanisms for assuring a supervised teaching experience of high quality, and (iii) increased institutional commitment.

The Department of Chemical Engineering is uniquely positioned to meet the identified need, with 11 of its 15 full-time faculty members having research expertise in various aspects of chemical engineering separations. Collectively they have published nearly 400 research articles in this area. The Department is also host to two research and training centers on biological, chemical, and environmental separations: The Colorado Institute for Research in Biotechnology (funded since 1987 with state and industrial funds) and the Center for Separations Using Thin Films (funded since 1990 with industrial, federal, and state support). The Department and its industrial associates are committed to providing first-rate training to an expanded group of PhD students in membrane-based and other modern separations processes. The proposed project addresses the national need for advanced training in modern separation techniques, with the following general objectives:

- *To provide a unique educational and research program in modern chemical engineering separations, which will be sustained beyond the duration of the requested support.*
- *To help the United States retain economic competitiveness in biotechnology and chemical technologies which depend heavily on separations processes.*
- *To help the United States practice responsible manufacturing processes which do not release contaminants to the environment.*
- *To address current and anticipated shortages of engineers who are trained for teaching and research careers related to biological, chemical, and environmental separations, by increasing the number of U.S. students who pursue and complete PhD degrees in this critical area.*
- *To provide adequate financial support to talented students with demonstrated financial need which would otherwise prevent them from full-time graduate study.*
- *To enlarge the pool of qualified PhD students in engineering by making special efforts to recruit and retain women and underrepresented minorities.*