

Contact: Diana Gonzalez

**PROPOSED NEW INSTITUTE AT THE UNIVERSITY OF IOWA**  
**IOWA INSTITUTE OF BIOMEDICAL IMAGING**

**Action Requested:** Consider approval of the request by the University of Iowa to establish a new Institute of Biomedical Imaging that will report to the Carver College of Medicine and the College of Engineering.

**Executive Summary:** The goal of the proposed Institute is to facilitate interdisciplinary inter-departmental, inter-collegiate research in the field of biomedical imaging and image analysis. The proposed Institute will not grant degrees. This proposal was reviewed by the Board Office and the Council of Provosts and is recommended for approval. This request addresses the Board of Regents' Strategic Plan priorities (3.0) to "discover new knowledge through research, scholarship, and creative activities and (2.0) to provide needed service and promote economic growth."

**Background:**

◇ Objectives of proposed Institute.

- ☑ Improve communications at the human contact level and electronically with appropriate external alliances.
- ☑ Facilitate biomedical imaging instrument acquisitions, maintenance, and new device development.
- ☑ Facilitate image data processing and analysis and image file archiving and retrieval.
- ☑ Translate biomedical imaging research in a bi-directional manner from bench to bedside.

◇ Rationale for proposed Institute.

- ☑ Biomedical imaging and image analysis is of critical importance for modern disease diagnosis.
- ☑ A group of biomedical imaging and image analysis researchers at SUI has received more than \$33 million in extramural funding over the past five years.
- ☑ The group's researchers have proven their ability to collaborate effectively in a multidisciplinary environment to achieve major advanced in the field.
- ☑ Sustainable growth of biomedical imaging research at the University of Iowa requires a greater degree of team identity to maximize interactions and explore new opportunities.
- ☑ The current position of the University of Iowa among prominent national sites for biomedical imaging and image analysis research requires an institutional focus, commitment, and longer-term vision. These are important incentives for team leaders to avoid the targeted recruitment by other institutions with aggressive agendas.

- ☑ Biomedical imaging is a multidisciplinary field. The biomedical imaging and image analysis researchers belong to four colleges and more than 15 departments. The group's productivity, interdisciplinary communication, and overall research interactions can be substantially improved by creating an interdisciplinary institute focusing on biomedical imaging.
- ☑ There is substantial interest in using imaging methods for biomarkers to assess drug and device response. This provides increased academic and business opportunities in the state.
- ◇ Objectives of proposed Institute. The proposed Institute will enhance collaboration among the constituents involved in biomedical research and increase efficiency and productivity of its members.
  - ☑ Document and further the understanding of the scientific bases of medical image analysis and explore their uses by conducting basic and applied research, independently and collaboratively.
  - ☑ Contribute to the development, refinement and clinical utilization of new imaging methodologies using appropriate process models.
  - ☑ Disseminate knowledge, experience and the results of findings through archival publications, lectures, symposia, continuing education programs, commercialization, and other appropriate avenues.
  - ☑ Train graduate students, post-doctoral fellows, and other researchers.
  - ☑ Foster the establishment of research programs at SUI and at collaborating institutions that bring results of the biomedical image analysis research from bench to bedside.
  - ☑ Promote interactions with industry and the development of new imaging technology.
  - ☑ Contribute to the national and international development of image based standards through interaction with appropriate bodies, such as the National Institute of Standards and Technology.
- ◇ Relationship of proposed Institute to other centers/institutes at the University. The proposed Institute expects an active collaboration with existing centers, such as the Iowa Institute for Hydraulic Research, Center for Computer Aided Design, Holden Comprehensive Cancer Center, Cardiovascular Center, Center for Bioinformatics and Computational Biology, Iowa Center of Excellence in Image Guided Radiation Therapy, and Iowa Center on Aging. Close ties are anticipated between the proposed Institute and the Institute for Clinical and Translational Science and the planned Institute for Biomedical Discovery. The proposed Institute will interface with, provide expertise to, and facilitate multi-faceted partnerships with other institutes at the University.
- ◇ Duplication. SUI is the only university in the state that has the resources and synergies to establish such an institute with both a research mission and an academic contribution. Nationally, there are only a few similar centers – University of North Carolina, Vanderbilt University, MIT-Harvard University, Yale University, and Stanford University.

- ◇ Special features of proposed Institute.
  - ☑ There are more than 110 faculty involved in biomedical imaging at the University which make it one of the largest programs in the country. There is faculty representation from four colleges – Public Health, Liberal Arts and Sciences, Medicine, and Engineering.
  - ☑ Ten percent of the College of Engineering faculty members are active in biomedical imaging research.
  - ☑ Approximately 50 graduate students and ten post-doctoral researchers will participate in the proposed Institute's activities at any given time.
  - ☑ A number of departments will be directly involved, including Electrical and Computer Engineering; Mathematics; Radiation Oncology; Orthopedics; and Environmental Health.
  - ☑ There is active collaboration along basic science and clinical applications, such as medical image acquisition, cardiovascular imaging and image analysis, and pulmonary image analysis.
  
- ◇ Workforce needs. The demand for highly educated interdisciplinary researchers and graduates has been identified by academia and industry. The National Institutes of Health Roadmap states, "the scale and complexity of today's biomedical research problems increasingly demands that scientists move beyond the confines of their discipline and explore new organizational models for team science. For example, biomedical imaging research often requires radiologists, physicists, cell biologists, and computer programmers to work together in integrated teams." Similarly, medical device manufacturers are interested in hiring M.S. and Ph.D. level biomedical imaging professionals from the University's programs.
  
- ◇ Job creation. The proposed Institute is expected to create new jobs and establish high-tech companies based in Iowa. To date, two companies have been established which provide medical image analysis software; both were started by University faculty and both are licensing intellectual properties developed at the University. These two companies are expected to grow in the near future and to offer high paying jobs. Establishment of new biomedical imaging companies is also expected to follow as a result of the proposed Institute.
  
- ◇ Resources needed. The proposed Institute will build on activities related to biomedical imaging, with significant existing infrastructure in research laboratories, equipment, and personnel. The proposed Institute will require an administrative office and office support, which will initially be located on the 3<sup>rd</sup> floor of the Medical Research Center. Eventually, the proposed Institute will be located in the new Biomedical Discovery building which is underway. Approximately 17,000 square feet will be assigned to the proposed Institute in the new building.
  
- ◇ Expected need. The proposed Institute is expected to be in existence for a significant period of time. The proposed Institute will be evaluated against performance metrics on an annual basis and formally reviewed every five years. Continuation will be based on performance.
  
- ◇ Funding sources. Funding sources for the proposed Institute include existing and new research grants and contracts; college reallocations; and departmental reallocations. The research base of the proposed Institute is not dependent on any single grant. However, a significant and long-term decline in external funding would negatively affect the proposed Institute.

- ☑ College and departmental commitments to the proposed Institute include three new faculty positions between the Colleges of Engineering and Medicine. One position is a joint appointment between Radiation Oncology and Electrical and Computer Engineering. A second position is a joint appointment between Radiology and Electrical and Computer Engineering. The third position is a joint appointment between Internal Medicine and Electrical and Computer Engineering.
- ☑ The Colleges of Engineering and Medicine will also provide \$75,000 per year for three years as unrestricted support for the proposed Institute activities.
- ☑ To date, the Carver College of Medicine has contributed more than \$1.8 million in facilities renovation/construction costs for the biomedical imaging group.
- ◇ Costs. The cost of the proposed Institute is expected to be \$75,000 during the first year and \$825,000 by year 7. Costs represent current commitments related to administrative support and faculty hires.
- ◇ Link to Strategic Plan. The proposed Institute addresses the University's Strategic Plan. It also addresses one of the platforms recommended in the Battelle Report for Iowa's Bioscience Pathway for Development.

Details about the proposed Institute are available in the Board Office.