

# The AIMBE News

A publication of the American Institute for Medical and Biological Engineering O May 2003 O 2003:1

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Arthur J. Coury

## A letter from AIMBE's President

Dear Colleagues Working in Medical and Biological Engineering:

This is my first report to you as President of this great Institute. I am a relative newcomer to AIMBE (Fellow, 1998), and the Board of Directors, (Vice President At-Large 2000). I have learned much in this short period about the history, achievements, workings and challenges of AIMBE in this short time and will learn much on the job. Our recent Annual Meeting was a "crash course" in the opportunities and challenges we face. Based on this input, I am supplementing my original goals for this term and am summarizing them here.

### Value

In any professional organization that I have held a leadership role, I have emphasized "value to the membership." I am fully aware that you, the membership of AIMBE are a very diverse group consisting of Fellows, through the College of Fellows; societies, through the Council of Societies; universities, through the Academic Council; and corporations, through the Industrial Council. It is nearly impossible to determine the numbers here, but, clearly, we have a unique and complex situation.

If you are a Fellow, you already derive much value in the prestige it brings. You should expect excellence in the Annual Meeting where you will network with colleagues and

learn facts and techniques to affect public policy. The greatest value you experience should come from the results you generate by applying expertise to influencing the directors of medical and biological engineering. The same goes for the Councils. You have a forum, a respected entity within which you can work and the tremendous leverage of thousands and thousands of colleagues to draw upon to get the work done – a proposition of great potential value.

*"In any professional organization that I have held a leadership role, I have emphasized "value to the membership."*

### Public Policy Thrusts

While AIMBE leadership has been active throughout the years in carrying the public policy torch and its achievements are significant, our former President Buddy Ratner wisely sought to increase the base of active Fellows by setting up SWATS (Strategic Working AIMBE Teams) in a number of areas. I have asked Buddy to continue to oversee his brainchild and he has accepted! *See more details on the SWAT project, page 5 of this issue.*

The Council of Societies, following through after a tremendous response of members of its Societies, is developing

a "National Affairs Agenda," and setting up working groups in several thrust areas. The Academic Council has an established history of addressing issues of importance to education. The Industry Council is in its early stages of developing a public policy agenda, and has several concepts under consideration.

### Financial/Organizational Viability

From our earliest days we have depended on generous outside support, particularly from the Whitaker Foundation for our operations. Foundation grants have essentially concluded, so we are in the early stages of a capital campaign to secure donations support for operations. So far, we have held our own, financially. But more funding sources are required as we become self-sustaining. Details will follow.

### Communication of the Purposes, Achievements and Resources of AIMBE

A very important experience I had during the Annual Meeting was the observation that the newer Fellows, in particular were not familiar with the charter, goals and significant achievements of the Institute and their critical role. This pressing issue calls for action on several fronts:

- We will improve the Fellows notification process. New Fellows will receive an enhanced information packet  
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and more detailed notification letters explaining their privileges and responsibilities.

- Nominators of Fellows to be inducted will be encouraged to contact, congratulate and instruct inductees in the honor and responsibilities of their position.
- The Annual Meeting program will contain an introduction explaining the purposes of the Institute and more detailed contact information.
- A directory of <sup>Pr</sup>AIMBE members and contacts early this year.
- At least 3 Newsletters will issue over the year.
- At the suggestion of a SWAT team, I have instituted a Communications Committee (*ad hoc* for now) to deal with issues of intended and extended communication. This committee is in the formulation stages for now, but the potential is very exciting.

### **Outreach and Support to Important Organizations**

The Society can leverage and enhance its effectiveness by extending and publicizing its support to important partners in pursuing common goals. The Academy of Radiology Research (ARR) teamed with AIMBE to help the National Institute for Biological Imaging and Bioengineering (NIBIB) get established. We collaborate regularly with these entities. With Board approval, AIMBE co-sponsors conferences relevant to its purposes. Finally, AIMBE is developing approaches to leveraging the public policy capabilities of the members of

its councils. This is “grass roots” work that will take some time to realize.

In conclusion, one year at the helm is a short time to execute any important initiative. The stated goals are intended to build on the dedicated work of my predecessors, and address some pressing issues. Your input and energy are critical if we are to make a major impact in achieving the ambitious goals stated above.

Arthur J. Coury  
*President*

## **Appropriations update**

With his signature on February 20<sup>th</sup>, President Bush finalized the appropriations process for the current year. As in recent past years, the final bill was long overdue in completion, and contained increases for both the National Institutes of Health (NIH) and the National Science Foundation (NSF).

For NIH, the spending package includes \$27.1 billion, an increase of \$3.6 billion over the previous fiscal year. For the National Institute for Biomedical Imaging and Bioengineering, the bill includes \$280 million, including a \$150 million increase from a transfer of grants from other NIH institutes. The grant transfer had been recommended by a committee requested by Congress and constituted by NIH consisting of nine individuals from NIH, AIMBE, and the Academy of Radiology Research (ARR).

The need for the transfer as recommended by the NIH committee was supported in a joint letter to the appropriations committees by AIMBE President Buddy Ratner and ARR President and AIMBE Fellow Philip Alderson. As noted in their joint letter, “implementing this transfer in a timely manner is important to both the NIBIB and the scientific investigators whose

research grants are affected.” As noted by Ratner and Alderson, implementation of the transfer “will provide investigators with a degree of certainty and a means of obtaining information on a timely basis.”

Debate on next years appropriations, scheduled to take effect on October 1<sup>st</sup>, began even before the Congress passed and the President signed the current year’s bill. President’s Bush budget request for NIH next fiscal year is for \$27.6 billion, an increase of 1.8 percent. For NSF, the President has recommended a budget of \$5.5 billion, a proposed increase of 3.8 percent.

The first substantive step in setting budget parameters was action taken in April by the House and Senate budget committees. The budget committees set broad spending targets for the various governmental functions. While agency targets are not generally addressed, the final budget bill did include an amendment sponsored by Sen. Arlen Specter assuming a 10 percent increase for NIH funding.

### **The AIMBE News**

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# The essence of the bioengineer

**Buddy D. Ratner**  
*AIMBE Past President*

AIMBE represents some 30,000+ practicing bioengineers in the United States. The NIH's youngest institute, the National Institute of Biomedical Imaging and Bioengineering (NIBIB), sports bioengineering in its name. The National Academy of Engineering \$500,000 Russ Prize honors seminal contributions to bioengineering. There are sixty or more Departments of Bioengineering (or Biomedical Engineering) at universities in the US. Surely, we must be clear about the nature of our field, given its visibility and impact? Based on some recent observations, I fear this is far from the case. But, maybe by addressing the issue, stirring up the waters, confronting realities, we can begin to crystallize ideas that will lead to a useful definition and appreciation of the core nature of bioengineering.

This short article to the bioengineering community, and particularly to AIMBE Fellows, is prompted by a comment made by an audience participant at a recent Bethesda NIBIB workshop on training opportunities. The comment implied a distinction between bioimagers and bioengineers – these designators were felt to be necessary to separate the two groups. Are bioengineers indeed different from bioimagers? Are bioimagers a sub-group within the bioengineering community? How different are bioimagers from bioengineers? Which other disciplines intersect bioengineering and bioimaging? What common knowledge base, problems solving tools and

philosophy do bioengineers share? Let's dive into these questions.

Consider this list of disciplines:

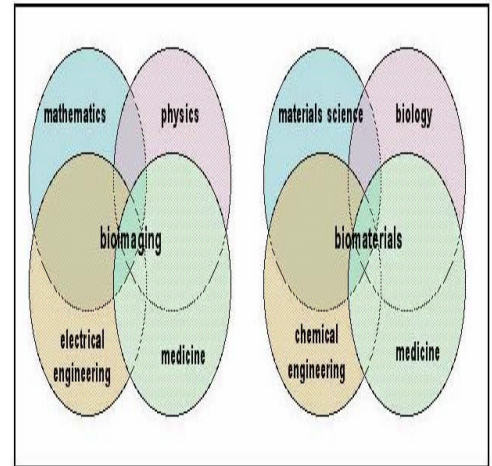
bioengineering,  
biomedical engineering,  
bioimaging,  
biophysics,  
medical physics,  
computational biology,  
molecular bioengineering,  
nanobiotechnology,  
genome sciences,  
tissue engineering,  
genetic engineering.

They all have things in common: technology, biology, medicine, mathematics, interdisciplinarity. We can order the disciplines on a continuum line from fundamental knowledge, through applied science, through technology and finally to commercial product. Interestingly, they all exploit or develop imaging methods.

***“I believe it is essential for our community to support and strengthen NIBIB and ensure that technology contributions to medicine and biology are understood.”***

Note that professionals in every one of these disciplines frequently work side by side with physicians. These disciplines would seem to have substantial overlap. In fact, Dr. Robert Rushmer, a cardiologist who passionately believed in physicians working side by side with engineers, an early bioimager and a pioneer in the modern field of bioengineering, would probably use Venn diagrams (overlapping circles that highlight intersections and differences) to represent the commonality of these disciplines. Two disciplinary Venn diagrams for bioimaging and for my

own specialty, biomaterials, might be drawn this way :



There are clearly substantial similarities. In fact, if I view my own research activities over the past few years I find that I have published on new microscopy methods to image interactive forces between biomolecules on surfaces, solutions to the inverse problem to reconstruct biosurface compositions, chemical spatial imaging of tissue slices and the use of ultrasound in drug delivery. Bioimagers, interestingly, work in areas having much in common with my biomaterials specialty. They work on molecular targeting of contrast agents, imaging phantoms and hydrogels for coupling and focusing ultrasound. There's much common ground for two disciplines (biomaterials and bioimaging) that might be perceived to be different or separate.

It is intriguing to focus on the essential commonality of all our activities around biology, medicine and technology. Sydney Brenner, Albert Lasker Medical Research Award recipient and molecular biologist at the Salk Institute said, "Progress in science depends on new techniques, new discoveries and new ideas, probably in that order." Think of what the gene sequencer (that, incidentally, images polyacrylamide

*(continued, page 4)*

electrophoresis gels), the protein synthesizer and biosurface gene arrays (highly imaging intensive) have done for modern biomedicine and biotechnology. In trying to comprehend why it has taken so long to understand why humans and chimps, which are 98.7% genetically similar, are so different, Harvard molecular anthropologist Maryellen Ruvalo said, "As technology changes, we can ask different questions." Technology leads modern biology and medicine. With new tools, advances can be made, knowledge and therapies accelerated. This theme has been championed by the American Association for the Advancement of Science (AAAS), numerous philosophers of science and most recently by the US Congress that gave us our new NIBIB Institute.

Two publications on the origins of biomedical engineering, highlighting the close parallels and intertwined roots of biomedical engineering and bioimaging, were recently published by the IEEE Engineering in Medicine and Biology Society. Coordinated and edited by Fred Nebeker of the IEEE History Center, the publications are titled "Golden Accomplishments in Biomedical Engineering" and "Voices of Experience." They present a remarkable view of the history, growth and towering accomplishments of bioengineers. A historical thread running hundreds of years, a feeling of accomplishment, a cohesiveness for the profession and a sense of pride are wonderfully reinforced by these colorful accounts.

NIBIB has given new legitimacy to our avocation. But NIBIB has been, and continues to be, criticized by others within the NIH and even by some in Congress. NIBIB is a new idea for the NIH -- the new kid on the block. NIBIB is an institute that can serve as a resource (and a leader, if you believe technology leads biology) for most every other institute. NIBIB is an institute dominated by

equations, technologists and engineers rather than by clinicians and basic biologists. NIBIB is an institute that facilitates and enables the work of the NIH. Such an idea may be threatening to the present "silo inhabiting" clinical/biological leaders in each disease/organ institute in the NIH.

I believe it is essential for our community to support and strengthen NIBIB and ensure that technology contributions to medicine and biology are understood. Rather than separating into "bioimagers" and "bioengineers," with unity, NIBIB will be strengthened and focused. As Ben Franklin said, "We must all hang together, or most assuredly we shall all hang separately."

Is the issue in a name? I'd be glad to call myself a "bioimager," if that made sense. It really doesn't. Maybe I should call myself a "biomaterialist?" This is accurate, but not central to the discipline. I believe the field is accurately and effectively served if we call ourselves "bioengineers." Just as electrical engineers who do ICs, and electrical engineers who do MEMS, and electrical engineers who do power supplies, all think of themselves as electrical engineers, we must all think of ourselves as bioengineers. My surgeon colleagues are certainly involved with biomaterials research. Yet, they call themselves "surgeon" before "biomaterialist." So too, radiologists introduce themselves as "radiologist" before they would use "bioimager."

Bioengineer has a nice ring to it. Leonardo DaVinci would have been proud of this designation. Thomas Young, M.D. (1773-1829) who studied fluid flow through elastic tubes and refraction of the eye would have seen the centrality of the name. Paul N. Zoll, Harvard cardiologist who worked on some of the first pacemakers, could certainly relate to this name. University of Washington cardiologist Robert Rushmer, a pioneer in ultrasound

imaging, was immensely proud to be called a bioengineer.

We defocus our efforts by erecting disciplinary silos within a field that embraces interdisciplinary endeavor. Our needs are best served by supporting the training and research missions of NIBIB with enthusiasm, passion and most importantly with solidarity. Our students will benefit from receiving a broad bioengineering education, and then specializing in biomaterials or bioimaging or biomechanics or bioelectronics (or going on to study medicine). The technology in medicine and biology field is young -- its time to coalesce as a community -- and a bioengineering community sounds like a good rallying point to me.

**Reminder . . .**

## **College of Fellows Nominations**

**Nominations for AIMBE's  
College of Fellows are  
currently being welcomed for  
the Class of 2004.**

**Information and nomination  
forms are on the web at  
<<http://www.aimbe.org/nomfrm.htm>> or request fax of  
form and instructions by  
emailing <[info@aimbe.org](mailto:info@aimbe.org)>**

**Nominations are due July 1,  
2003**

# Annual Event highlights

Braving unusual snows and winter weather, over 200 individuals attended AIMBE's 12<sup>th</sup> Annual Event on February 20<sup>th</sup>-24<sup>th</sup> at the National Academy of Sciences and the Westin Grand Hotel in Washington.

Thursday's program featured presentations by a number of program managers and federal agency representatives at the symposium on "Federal Programs in Medical and Biological Engineering." The program, co-sponsored by AIMBE and the National Science Foundation, was chaired by AIMBE Fellow Sohi Rastegar.

On Friday, participants gathered at the main auditorium of the National Academy of Sciences for the major symposium session on "Bioengineering Education in the 21<sup>st</sup> Century." Chaired by AIMBE Fellow Janie Fouke, the symposium featured topical sessions on platform technologies for contemporary bioengineering inquiry, industry and bioengineering education, and education in and about bioengineering.

The keynote address was delivered by Roderic I. Pettigrew, the first director of the National Institute for Biomedical Imaging and Bioengineering (NIBIB), who shared with the audience the progress made by NIBIB during its first full year of operation.

The highlight of the day was the induction of 57 individuals into AIMBE's College of Fellows (see full listing, pages 6-9).

Saturday's program featured three forums – on bioengineering education outreach, continuing education in bioengineering, and SWAT teams in action.

## SWAT Teams swing into action

A new feature of this year's program was the initiation of Strategic Working AIMBE Teams (SWATs). The forum and overall project was initiated by outgoing AIMBE President Buddy Ratner.

An estimated 100 AIMBE Fellows demonstrated high enthusiasm at the first sessions.

Six SWAT teams were formed:

- Medical Device Liability, Healthcare Industry. The chair is Subrata Saha at <shahas@alfred.edu>.
- Animal Testing to Clinical Use. The chair is Peer Portner at <pmportner@aol.com>.
- Public's Perception of Risk and Threat. The co-chairs are Rebecca Richards-Kortum at <kortum@mail.utexas.edu> and Buddy Ratner at <ratner@uweb.engr.washington.edu>.
- Facilitating NIBIB's Mission. The chair is Philip Alderson at <poal@columbia.edu>, assisted by Kevin O'Connor at <kwoaimbe@aol.com>.
- Bioterrorism Research and Development. The chair is Luis Kun at <l.kun@ieee.org>.
- AIMBE interacts with the Research/Education Community. The chair is Martha Gray at <mgray@mit.edu>.

The SWAT teams will be working throughout the year, and serve as an excellent way for Fellows to become involved. Contact any of the SWAT chairs to become involved, or contact Buddy Ratner, coordinator of the

overall SWAT effort, at <ratner@uweb.engr.washington.edu>.

## AIMBE Board of Directors meeting

The AIMBE Board met on Sunday, February 23, at the conclusion of the Annual Event. Highlights:

### President's Greetings

President Art Coury welcomed new Board members, and expressed thanks to those members continuing in their service to AIMBE. He announced several goals for the upcoming year: to reach financial goals of the Institute, cultivate ongoing relationships with the radiology community, maintain the value of achievements made (e.g., biomaterial availability, growing the National Institute of Biomedical Imaging and Bioengineering (NIBIB), assuring a positive Annual Event in 2004, making sure all components of AIMBE's membership are seen as equal partners, and increasing our visibility to the public and scientific community.

Several activities in this regard that are planned include: a review of the Galletti Award Committee structure and function, continuation and enhancement of the SWAT teams, and creation of a new Fellows orientation program in 2004.

Coury also announced the results of the AIMBE and College of Fellows elections. Don Giddens was elected as AIMBE President-Elect; Linda Griffith and Herb Voigt were elected as AIMBE Vice Presidents At-Large; and Ken Diller was elected as AIMBE College of Fellows Chair-Elect.

### Past President's Remarks

Ratner thanked the Board for their support during the past year. He

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remarked on goals and achievements during his tenure, including the establishment of SWAT teams to address important public policy issues and to involve more members in AIMBE, and the planning of two Annual Event programs simultaneously.

#### **IFMBE**

Dov Jaron presented a report on activities of the International Federation of Medical and Biological Engineering (IFMBE). AIMBE is the United States representative to IFMBE, and Jaron serves as its current President. The most recent conferences were held in Vienna, Austria and in Singapore. The major achievement of the group during the past year has been the establishment of a representative group in Europe, which has been a challenging goal given the number of countries involved.

AIMBE needs to name delegates for the next World Congress, to be held in August 2003. Consensus was that delegates need to be named by August of this year.

#### **Annual Event 2004**

Frank Yin presented the preliminary outline for the program for the AIMBE Annual Event for 2004, the title of which is "The Intersection of Imaging and Biomedical Engineering," to be held February 26 – March 1, 2004. A program planning committee is in place and making progress on the full program.

#### **Academic Council**

Eugene Eckstein reported that the Academic Council, at its meeting earlier in the day, approved the membership of two new full members (University of California at Irvine and Binghamton University) and the affiliate membership of Bucknell University. The Board approved adoption of the memberships.

#### **Council of Societies**

Michael Ackerman reported on the Council meeting held earlier during the day. The Council made several suggestions to the AIMBE Board, the following of which were adopted:

- 1) That AIMBE annually ask each AIMBE Fellow to indicate up to three Societies which each individual is involved in as an active member.
- 2) That Annual Event program book should add: a) the AIMBE mission statement and current policy issues, b) comprehensive abstracts; c) alphabetical list of members with present affiliation, primary society membership, and year of election; d) list of AIMBE Board members; and d) list of Council of Society members. The Council's intent will be considered in revision of the program book.
- 3) That AIMBE White Papers be released at a uniform time by AIMBE and all member Societies.

#### **Industry Council**

Vince DeCaprio reported that the Industry Council meeting in the earlier part of the day resulted in discussion of how AIMBE can create value to industry. Two points of consensus emerged: 1) To help create a positive image of medical device companies; and, 2) To help speed the acceptance of innovation in the marketplace.

Two key goals: 1) Increase the number of industry-based Fellows—both starters (innovators) and finishers (those who get help get product to marketplace); and 2) Creation of specific workshops that can serve as a product AIMBE produces that creates value for industry.

**AIMBE on the web:**

**[www.aimbe.org](http://www.aimbe.org)**

#### **College of Fellows inducts 55**

The following individuals were inducted into AIMBE's College of Fellows at the Annual Event:

##### **C. Mauli Agrawal, Ph.D.**

University of Texas Health Science Center

For achieving major advances in orthopedic and cardiovascular biomaterials leading to valuable products and for exceptional professional leadership and service.

##### **Gerard A. Ateshian, Ph.D.**

Columbia University

For unique and fundamental scientific breakthroughs in the study of cartilage mechanics, diarthrodial joint biotribology, and functional tissue engineering.

##### **Michael L. Boninger, M.D.**

University of Pittsburgh

For contributions to integration of rehabilitation engineering into clinical practice, and for prevention of secondary conditions among people with disabilities.

##### **Richard B. Borgens, Ph.D.**

Purdue University

For seminal contributions to the restoration of nerve impulse conduction and pioneering research for rapid repair of spinal injury.

##### **Grigore C. Burdea, Ph.D.**

Rutgers University

For contributions to the rehabilitation of chronic post-stroke patients through the use of novel virtual reality systems.

##### **Robert W. Christensen, D.D.S.**

TMJ Implants, Inc.

For developing new dental and temporomandibular joints which have helped many patients.

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**Gerard L. Cote, Ph.D.**

Texas A & M University

For significant contributions in optical biosensing research and education, and leadership in the field.

**William Craelius, Ph.D.**

Rutgers University

For pioneering the first multi-finger prosthesis and discoveries on cellular mechanotransduction forming the foundation for much of the current work in the field.

**Martyn C. Davies, Ph.D.**

University of Nottingham

For pioneering efforts in the structural characterization of biomaterials and interfacial interactions through surface analytical techniques.

**Donna J. Dean, Ph.D.**

National Institutes of Health

For directing the initial establishment of the National Institute of Biomedical Imaging and Bioengineering and for important contributions to the field.

**Edward J. Delp, III, Ph.D.**

Purdue University

For innovations in mammography and ultrasound cardiac imaging through the use of signal and image processing.

**Scott L. Delp, Ph.D.**

Stanford University

For creating computer models that provide highly accurate representations of musculoskeletal structures and new insights into musculoskeletal function.

**Peter C. Doerschuk, M.D., Ph.D.**

Purdue University

For unique contributions in computational methods for biological x-ray crystallography, three-dimensional virus reconstruction, and statistical image processing.

**William A. Friedman, M.D.**

University of Florida

For outstanding contributions in the areas of application of evoked potential techniques and image guided neurological surgery.

**Linda M. Graham, M.D.**

Cleveland Clinic Foundation

For pioneering contributions to our understanding of vascular cell function on biomaterials.

**Christopher J. Hardy, Ph.D.**

General Electric Global Research Center

For contributions in magnetic resonance and leadership in cardiac and coronary MR imaging.

**Leaf Huang, Ph.D.**

University of Pittsburgh

For pioneering the use of liposome biomaterials as gene carriers in human application.

**William C. Hunter, Ph.D.**

New Jersey Institute of Technology

For significant contributions to bioengineering of the heart, which has allowed integrated understanding of cardiac contraction from protein to pump.

**Jal S. Jassawalla**

World Heart Inc.

For key contributions and engineering innovations in the development of implantable mechanical circulatory support systems.

**Mark Johnson, Ph.D.**

Northwestern University

For pioneering contributions to the quantitative understanding of aqueous humor dynamics, glaucoma and other diseases of the eye.

**Richard D. Jones, Ph.D.**

Christchurch Hospital

For outstanding contributions to neuroengineering, neurosciences, and human performance

engineering and international leadership in the discipline of biomedical engineering.

**David L. Kaplan, Ph.D.**

Tufts University

For recognized contributions to the field of biopolymer engineering, including manipulation and control of polysaccharide and fibrous protein structure and function.

**Gregory T.A. Kovacs, M.D., Ph.D.**

Stanford University

For pioneering instrumentation for biomedicine and biotechnology, including cell-based sensors, chemical and biological toxin screening, environmental monitoring, and pharmaceutical development.

**David S. Kristol, Ph.D.**

New Jersey Institute of Technology

For dedication to students as a biomedical engineering education and mentor, and to the field as a leader establishing educational programs.

**Casimir A. Kulikowski, Ph.D.**

Rutgers University

For pioneering expert systems and machine learning methods in medicine and for developing novel techniques for bioinformatics modeling and data analysis.

**Thay Q. Lee, Ph.D.**

VA Long Beach Healthcare System

For significant contributions to rehabilitation engineering.

**Abraham M. Lenhoff, Ph.D.**

University of Delaware

For application of protein biophysical methods and modeling to understanding engineering systems in chromatography, crystallization, and other separations processes.

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**Robert J. Lutz, Ph.D.**

National Institutes of Health  
For creative application of chemical engineering science and practice to problems in medicine and biology.

**Alexey L. Margolin, Ph.D.**

Altus Biologics  
For outstanding contribution, innovation and leadership in the field of protein drug delivery, therapeutic applications of enzymes, and industrial enzymology.

**Tofy Mussivand, Ph.D., D.Eng.**

University of Ottawa Heart Institute  
For outstanding contributions to the development of implantable ventricular assist systems, including remote power transfer and patient monitoring technologies.

**Barry S. Myers, M.D., Ph.D.**

Duke University  
For his pioneering work on cervical spine injury and protection and his contributions to understanding automobile injury biomechanics.

**George M. Pantalos, Ph.D.**

University of Louisville  
For continuing leadership in the development of implantable ventricular assist systems, and in modeling cardiovascular response to weightlessness.

**Roderic I. Pettigrew, M.D., Ph.D.**

National Institutes of Health  
For significant contributions to research in magnetic resonance imaging.

**Rangaraj M. Rangayyan, Ph.D.**

University of Calgary  
For outstanding contributions to the development of novel algorithms for biomedical signal and image analysis and computer-aided medical diagnosis.

**Isidore Rigoutsos, Ph.D.**

IBM Thomas J. Watson Research Center  
For innovative applications of pattern discovery to the field of bioinformatics and functional genomics.

**Kristina M. Ropella, Ph.D.**

Marquette University  
For leadership and excellence in biomedical engineering education and automated detection of cardiac arrhythmias.

**Arthur L. Rosenthal, Ph.D.**

Boston Scientific Corporation  
For leadership in the development and technology transfer of biomedical engineering devices and technologies that have improved patient care.

**Clinton T. Rubin, Ph.D.**

State University of New York at Stony Brook  
For pioneering biomedical engineering studies of musculoskeletal disease, injury, and treatment, including the early detection and prevention of osteoporosis, and the acceleration of fracture healing.

**Henry G. Rylander, III, M.D.**

University of Texas at Austin  
For development of numerous new types of instrumentation for neurobiology and biooptics and implementation in ophthalmic surgery.

**J. Chris Sackellares, M.D.**

University of Florida  
For leadership in using advanced signal processing to successfully predict epileptic seizures, and explore their treatment.

**Kuber T. Sampath, Ph.D.**

Genzyme Corporation  
For pioneering work in the discovery and characterization of growth factors with application to valuable products for tissue regeneration.

**Niilo Saranummi, Ph.D.**

VTT Information Technology  
For visionary contributions to the technology transfer of engineering principles in medicine and biology.

**Louis J. Soslowsky, Ph.D.**

University of Pennsylvania  
For outstanding contributions towards understanding shoulder joint function in health and disease, and advancing the treatment of soft tissue injuries.

**Paulette Spencer, D.D.S., Ph.D.**

University of Missouri - Kansas City  
For development of non-destructive, non-invasive techniques for micro-chemical and micro-mechanical characterization of reactions occurring at the synthetic material/biologic tissue interface.

**Natalia A. Trayanova, Ph.D.**

Tulane University  
For describing fundamental electrical cardiac behaviors using advanced computational methods and for significant contributions to biomedical engineering education.

**Kathryn E. Uhrich, Ph.D.**

Rutgers University  
For pioneering contributions to the design of novel polymeric materials for drug delivery and tissue engineering applications.

**Michael W. Vannier, M.D.**

University of Iowa  
For outstanding research, mentorship and leadership in the field of medical imaging and image analysis.

**Viola Vogel, Ph.D.**

University of Washington  
For pioneering studies on protein molecular dynamics and leadership in integrating bioengineering and nanotechnology.

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**Binseng Wang, Sc.D.**  
MEDIQ/PRN Life Support Services,  
Inc.

For his worldwide contributions and leadership in clinical engineering and quality management within public health systems and service companies.

**Lihong Wang, Ph.D.**

Texas A&M University

For outstanding contributions to research and education in biomedical optical imaging.

**Robert S. Ward**

The Polymer Technology Group

For unique and innovative contributions to the development and utilization of polyurethanes in medical devices.

**William J. Weiss, Ph.D.**

Penn State University

For pioneering development of the first clinically applied transcutaneous energy transmission system for heart assist devices.

**Peter N. T. Wells, Ph.D., D.Sc.**

University of Bristol

For his internationally recognized original and organizational contributions to imaging.

**John C. Woodard, Ph.D.**

Ventracor Ltd.

For outstanding, innovative contributions to the development of implantable cardiac assist systems for treatment of heart failure patients.

**Paul G. Yock, M.D.**

Stanford University Medical Center

For pioneering development of intravascular ultrasound, and contributions to design of devices and techniques in interventional cardiology.

## Three AIMBE Fellows inducted into NAE

Three AIMBE Fellows—Paul Citron, Yoram Rudy, and Victor L. Poirer—have been inducted into the National Academy of Engineering (NAE). NAE membership recognizes individuals who have made major contributions to the theory and practice engineering, advanced new and traditional fields of engineering, or improving engineering education.

Citron, vice president for technology policy for Medtronic in Minneapolis, was cited for “innovations in technologies for monitoring cardiac rhythm and for patient-initiated cardiac pacing, and for outstanding contributions to industry-academia interactions. Rudy, professor of biomedical engineering at Case Western University in Cleveland, was elected for leadership in genetic and molecular studies of cardiac activation and for new methods of diagnosing and treating heart disease. Poirer, of Thratec Corporation in Woburn, MA, was cited for the “design, development, clinical trial and commercialization of first generation left-ventricular assist systems for treating heart failure.”

## BECON Symposium to be held in June

The sixth annual BECON symposium is titled "Catalyzing Team Science" and is scheduled for June 23-24, 2003, at the Natcher Conference Center on the NIH Main Campus in Bethesda, Maryland. This symposium is aimed at examining the forces that encourage and discourage team approaches to biomedical research, and to explore ways in which the NIH, academia, and others can stimulate and reward team efforts. The program will consist of plenary presentations, breakout sessions, and case studies.

Janie Fouke of Michigan State University and Keith Brodie of Duke University are the Chairs of the BECON 2003 Symposium. Dr. Daniel Sullivan of the National Cancer Institute chairs the BECON planning group. Registration is open and continuing. Details concerning the symposium program, local arrangements, and registration are available at [www/becon.nih.gov/symposium2003.htm](http://www/becon.nih.gov/symposium2003.htm).

## HIPPA update

*(Excerpted from the ACCE News, volume 13(2), March-April 2003; Department of Health and Human Services release, April 30, 2003)*

After its release had been postponed several times over the last two years, the Department of Health and Human Service published the final Security Rule in the Federal Register on February 20, 2003.

The final rule, which applies to virtually all healthcare providers, covers electronic Protected Health Information (ePHI), or electronic data that could be used to identify a patient. The purported rule covers a broad range of health information (that related to a patient that was maintained or transmitted electronically). Covered entities have until April 21, 2005, to meet the standards spelled out in this rule.

In a separate development, the U.S. 4th Circuit Court of Appeals ruled in late April upholding the constitutionality of the HIPAA Privacy Rule. HHS Secretary Tommy Thompson said the court verdict was “a victory for the principle that the federal government can provide protections to insure the enhanced confidentiality of [patient’s] medical records.”

## **AIMBE MEETINGS**

**The AIMBE meetings calendar contains official AIMBE meetings, annual meetings of members of AIMBE's Council of Societies, and meetings of other groups where AIMBE is a cosponsor or endorser.**

**American College of Clinical Engineering**, 6<sup>th</sup> Symposium, June 14, 2003, Long Beach, CA. Contact: <[www.accenet.org](http://www.accenet.org)>

**American Society of Mechanical Engineers**, 2003 Summer Annual Meeting, June 15-19, Atlanta, GA, Contact: <<http://www.asme.org/events/>>

**American Society for Artificial Internal Organs**, 2003 Joint Conference with ISAO, June 19-21, Washington DC. Contact: <<http://www.asaio.org/>>

**RESNA**, 26<sup>th</sup> Annual Conference on Technology & Disability, June 19-23, Atlanta, GA. Contact: <<http://www.resna.org/conferences/index.html>>

**American Society of Mechanical Engineers, Bioengineering Division**, 2003 Summer Bioengineering Conference, June 25-29, 2003, Key Biscayne, FL. Contact: <<http://www.asme.org/divisions/bed/events/summer03.html>>

**Controlled Release Society**, 30<sup>th</sup> Annual Meeting and Exposition, July 19-23, 2003, Glasgow, Scotland. Contact: <<http://www.controlledrelease.org/meetings/index.htm>>

**American Society of Agricultural Engineers**, Annual International Meeting, July 27-30, 2003, Las Vegas, NV. Contact: <<http://www.asae.org/meetings/>>

**American Association of Physicists in Medicine** 45<sup>th</sup> Annual Meeting, August 10-14, San Diego, CA. Contact: <<http://aapm.org/>>

**World Congress on Medical Physics and Biomedical Engineering**, August 24-29, 2003., Sydney, Australia. Contact: <<http://www.wc2003.org/>>

**IEEE Engineering in Medicine and Biology Society**, 25<sup>th</sup> Annual International Conference, September 21-25, 2003, Cancun, Mexico. Contact: <<http://www.eng.unsw.edu.au/embs/confs.html>>.

**American Society of Biomechanics**, 2003 Annual Conference, September 25-27, Toledo, OH. Contact: <<http://asb-biomech.org/>>

**Southern Biomedical Engineering Conference**, "Bringing Physicians and Bioengineers Together," Charlotte, NC. Contact: <[www.heineman.org](http://www.heineman.org)>

**Biomedical Engineering Society**, 2003 Annual Meeting, Nashville, TN. Contact: <<http://www.bme.vanderbilt.edu/bmes2003/>>

**American Medical Informatics Association**, 2003 Annual Symposium, November 8-12, 2003, Washington, DC. Contact: <<http://www.amia.org/meetings/fmeet.html>>.

**American Institute of Chemical Engineers**, 2003 Annual Meeting, November 16-21, 2003, San Francisco CA. Contact: <<http://www.aiche.org/conferences/annual/>>

Biomedical Imaging Research Opportunities Workshop (BIROW), Early 2004, Washington DC. Details to follow.

**AMERICAN INSTITUTE FOR MEDICAL AND BIOLOGICAL ENGINEERING, 13<sup>th</sup> Annual Event, "Imaging and Bioengineering: Partners for the Future," February 26 – March 1, 2004, Washington, DC.** Contact: <<http://www.aimbe.org/meeting2004.htm>>

**Orthopedic Research Society**, Annual Meeting, March 7-10, 2004, San Francisco, CA. Contact: <<http://www.ors.org/Ors.asp>>

**International Society for Magnetic Resonance in Medicine**, 12<sup>th</sup> Scientific Meeting and Exhibition, May 15-21, 2004, Kyoto, Japan. Contact: <<http://www.ismrm.org/dates/>>

**Society for Biomaterials**, 7<sup>th</sup> World Biomaterials Congress, May 16-21, 2004, Sydney, Australia. Contact: <<http://www.biomaterials.org/meetings.htm>>

**MARK YOUR CALENDARS!**

**AIMBE 13<sup>TH</sup> ANNUAL EVENT**

**“Imaging and Bioengineering: Partners for the Future”**

**February 26 – March 1, 2004  
Washington, DC**

Medical and biological engineering has achieved prominent status as a major field in the United States. The spectrum of discoveries and opportunities that inhabit the intersection of biology and engineering has sparked the imagination and led to the establishment of bioengineering programs at scores of U.S. universities. Specialties and sub-specialties flourish. Thanks to the generosity of the Whitaker Foundation and programs funded by approximately a dozen Federal agencies, research and training opportunities have increased exponentially.

The establishment of the new National Institute of Biomedical Imaging and Bioengineering (NIBIB) at NIH is a significant event that underscores both the maturation and future promise of this field. The new institute provides a focus at the national level for supporting new opportunities and challenges as well as more traditional approaches. As the strategic direction for NIBIB comes into sharper focus over the coming year or two, there is an opportunity for the entire community to provide input to help shape its agenda. Key issues such as identifying the new innovations and discoveries, determining how best to translate research discoveries into useful products, engaging the imaging industry along the entire spectrum of discovery to product development, and educating the public and government about critical public policy issues related to imaging will affect all of us. AIMBE, being comprised of a broad spectrum of key opinion leaders and drivers of the field, needs to be engaged in helping shape the future development of NIBIB. We have a place at the table . . . whether and the extent to which we participate is up to us.

AIMBE's 13th Annual Event is entitled “Imaging and Bioengineering: Partners for the Future.” The establishment of NIBIB and the appointment of Elias Zerhouni, who works in this area, as the new director of NIH make the topic of next year’s event especially germane. One focus of the event will be to discuss new frontiers of imaging and bioengineering – especially as related to discoveries across length scales. The role of both disciplines and the interactive and symbiotic relationships will be highlighted. Another focus will be on best practices for translating discoveries from the laboratory to industry and the clinic. Some public policy issues related to imaging will also be discussed. Key figures in government, industry and academia will lead the discussion. In addition to the Symposium at the National Academy of Sciences Engineering and Medicine building, AIMBE’s constituent membership groups, the College of Fellows, Councils of Societies and Industry and the Academic Council, will host forums on public policy issues. As in prior years, the Annual Event program will include a kick-off workshop, co-hosted by AIMBE and the National Science Foundation, on federal

*(continued, page 12)*

programs in medical and biological engineering with an emphasis on obtaining funding. A new Fellows orientation session will take place that day also. We look forward to your joining us at this exciting and informative event in Washington, DC beginning on February 26, 2004.

**Thursday, February 26 – Westin Grand Hotel**

- Federal Programs Workshop (co-hosted by AIMBE and the NSF)
- New Fellows Orientation
- Council of Chairs Membership Meeting

**Friday, February 27 – National Academy of Sciences Engineering and Medicine Building**

- Keynote Speaker : Elias Zerhouni, Director, National Institutes of Health
- Symposium with Sessions to Include:
  - New Frontiers of Imaging and Bioengineering
  - Best Practices for Translating Laboratory Discoveries to Industry and the Clinic
  - Public Policy Issues Related to Imaging
- Induction of New Fellows

**Saturday, February 28 – Westin Grand Hotel**

- Forums Sponsored by AIMBE’s Constituent Membership Groups
- College of Fellows Membership Meeting
- Annual Banquet

**Sunday, February 29 – Westin Grand Hotel**

- Academic Council, Council of Societies and Industry Council Membership Meetings
- AIMBE Board of Directors Meeting

**Monday, March 1 – Capitol Hill**

Scheduled visits with offices of the U.S. Senate and House of Representatives

**Elias Zerhouni:  
living in interesting  
times**

*Elias Zerhouni has confirmed his participation as the keynote speaker at the next AIMBE Annual Event— to be held in Washington February 26 – March 1, 2004. In a recent interview “The NIH Catalyst,” an intramural NIH publication, Zerhouni discussed a number of issues stemming from his early months as NIH Director. Excerpts:*

**Q: How's the job so far? Any**

*surprises?*

ZERHOUNI: It's pretty good. It's working 16 hours a day, every day, but I'm amazed at how much has been accomplished: We've had intense brainstorming sessions and a retreat with the directors; we've outlined priorities and initiatives for NIH research; we've recruited new directors.

As for surprises, the biggest surprise is the complexity of it. There are so many constituencies, and the job is very public. Before, I had to scream to be heard; now anything I whisper becomes big

news. You have to readjust.

But it's the complexity of the inputs - inputs from the institutes, the scientific community, the Congress, the public - this job requires more breadth than I had expected. And the need for communications is much greater across the board than I had expected. I've learned a lot in talking to many of the constituencies.

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***Q: What seem to be the chief concerns of the constituencies?***

ZERHOUNI: Everyone wants to be assured that NIH has its act together. The chief concern is that now that we've doubled the NIB budget, is the NIB being true to its mission, is it delivering to the American people? I've been asked why the number of grants has not doubled, whether the new buildings are really necessary. Any high-profile federal agency that receives significant dollars will be questioned about whether those dollars are well used-and some people will think they are and some will not . . . NIH has a major role to play in advancing methodologies for research-discoveries in structural biology; the study of molecular complexes, which no one really knows how to do; the study of membrane-bound proteins-all the issues that relate to what I call mathematical biology.

***Q: Is the national focus on bioterrorrelated research relegating other NIII research to places of lesser importance and funding? How does the creation of the Department of Homeland Security affect NIH research?***

ZERHOUNI: One of the very first things on my agenda after I got here was this issue. Initially, it was presented that NIAID's biodefense research program would go into homeland security, and we worked very hard over several months regarding this issue. During talks involving the administration, the Department [of Health and Human Services], [NIAID director] Tony Fauci, and myself, we made clear that we could not recreate all the scientific skill set established in NIAID and in the extramural community, and that the country was well served by what we'd created. There will be a need to coordinate and consult with the Department of Homeland Security -

that's what NIH is all about - but I am not aware of any movement of people or shifts in research resources. As for the effect of funding on other NIH research, we've been given extra resources for biodefense research, so there should be no effect.

***Q: What about embryonic stem cell research?***

ZERHOUNI: Let's face it, before the president announced his policy, not one dime of the federal dollar was going into this research. It's a golden opportunity for NIH leadership-as a training ground, as a resource center, as a setter of strategic priorities. Any new science needs nurturing, and I immediately created a stem cell task force when I got here. We need to not get bogged down in rhetoric but to get down to work. There's a lot we don't know and must know we can entertain approaches to regenerative medicine.

***“NIH has a major role to play in advancing methodologies for research-discoveries in structural biology; the study of molecular complexes, which no one really knows how to do; the study of membrane-bound proteins-all the issues that relate to what I call mathematical biology.”***

NIH needs to frame the issue in a factual way. And, really, NIH is the one institution in this country that can serve as the source of trusted information for the public of what is and is not fact, what is speculation and what is unfettered by political consideration in this and all scientific research areas. If

you've lost the public trust, you've lost everything. And that's also one reason why you can't have 10 sources of conflicting information.

I came to this job with one very simple view, and that is that disease knows no politics-and I try to make sure that all parties understand that, all sides of the debate understand that.

***.Q: In the scheme of things in apportioning your time as NIH director, do you miss doing clinical radiology?***

ZERHOUNI: Not really. I do like to consult on the tough cases-that's what I did before-but right now I'm so totally focused on my job. My philosophy is that it's better to spend 100 percent of your time on your priority early on than 10 percent each on 10 different things because at the end of the day you will not have accomplished anything. But I do want to get back to some imaging research at some point.

***Q: Will you do that here?***

ZERHOUNI: I hope so. I still have some ideas left.

***Q: What are they?***

ZERHOUNI: Well, my primary research has been on using quantitative approaches-mathematics, computation to enhance the basic process of image acquisition to better diagnose and treat disease. Now, of course, quantitative analysis is the standard method, but let me tell you that my early papers-on measuring the intrinsic absorption of X-rays in lesions, on different calcium concentrations in tumors-generated years of controversy.

*(continued, page 14)*

One submitted paper generated 26 different criticisms needing to be addressed before it could be published. People thought it was too expensive, and there was inherent opposition to the idea of not operating surgically, even though two-thirds of the operations were for benign lesions. In my experience, any really groundbreaking paper had difficulty being accepted, while the mundane sailed through.)

We need another quantum jump of imaging in medicine. I envision that in 30 to 40 years there will be no open surgery. Traditional surgery will disappear, as will traditional anesthesia, and there will be only image-guided microsurgery. We're headed in that direction now.

Disease preemption is another research area that I'm hoping to do work in. It involves image guidance and the interaction of energy and biological molecules to put specific cell populations at rest and prevent them from becoming malignant. Breast cancer, for example, arises from less than 1 percent of mammary cells. Why could we not, around the time of menopause, put cells in a quiescent state to prevent the genetic cascade of events that result in breast cancer? Even moderate success would change the incidence of disease. The concept of preemption has not been explored, and, obviously, this approach has wider applications. This is what I'm hoping to do.

## **Zerhouni appoints Kington deputy director of NIH**

National Institutes of Health Director Elias A. Zerhouni has appointed Raynard S. Kington as the new Deputy Director of the National Institutes of Health (NIH).

"I am delighted to have Dr. Kington at my side as Deputy Director during this critical time for biomedical research," said Zerhouni. "He has shown great talent and has the right combination of skills and experience to help the NIH move forward in these revolutionary times for the biomedical sciences."

"NIH is the main engine behind medical discovery in this country and it is a great honor to be given this opportunity," said Dr. Kington. "I am looking forward to working with Dr. Zerhouni and the NIH leadership to help set the course for biomedical research in the 21st century."

Kington assumes the position held by Ruth Kirschstein, served as NIH Deputy Director since 1993, as well as Acting NIH Director from January 2000 to May 2002. She will become the Senior Advisor to the NIH Director.

Kington has served as NIH Associate Director for Behavioral and Social Sciences Research and Director of the NIH Office of Behavioral and Social Sciences Research since November 2000. He also served as the Acting Director for the National Institute on Alcohol Abuse and Alcoholism (NIAAA) from January 2002 until September 2002.

He came to NIH from the Centers for Disease Control and Prevention (CDC). As Director of the Division of Health Examination Statistics in the CDC's National Center for Health Statistics (NCHS), he led the National Health and Nutrition Examination Survey (NHANES), a comprehensive, ongoing survey of the health status, health behaviors, and diet of people in the United States.

Before joining the CDC, Kington

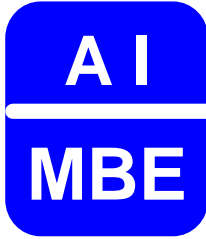
was a Senior Scientist at the RAND Corporation, where he co-directed the Drew/RAND Center on Health and Aging.

He earned undergraduate and medical degrees from the University of Michigan and then completed his residency training in Internal Medicine at Michael Reese Medical Center in Chicago. He attended the University of Pennsylvania as a Robert Wood Johnson Clinical Scholar, earning his M.B.A. and his Ph.D. in Health Policy and Economics from The Wharton School.

Board-certified in Internal Medicine and Public Health and Preventive Medicine, Kington's research has focused on social factors as determinants of health. His research has included studies of the role of socioeconomic status in explaining differences in health across populations; the determinants of health care services utilization; the health status and health behaviors of Hispanic and black immigrant populations; and the economic impact of health care expenditures among the elderly.

## **World Congress in August**

The World Congress on Medical Physics and Biomedical Engineering takes place in Sydney, Australia, from August 24-29, 2003. The World Congress is the major tri-annual event for the international engineering and scientific community. As of 6th May there have been over 1900 abstracts sent to reviewers. Others are yet to be processed. The deadline for early bird registration has been extended until 30th May, 2003. For program and registration information, visit [www.wc2003.org](http://www.wc2003.org). AIMBE is the United States representative to IFMBE.



# The AIMBE News

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