The Royal Academy of Engineering

Lovells

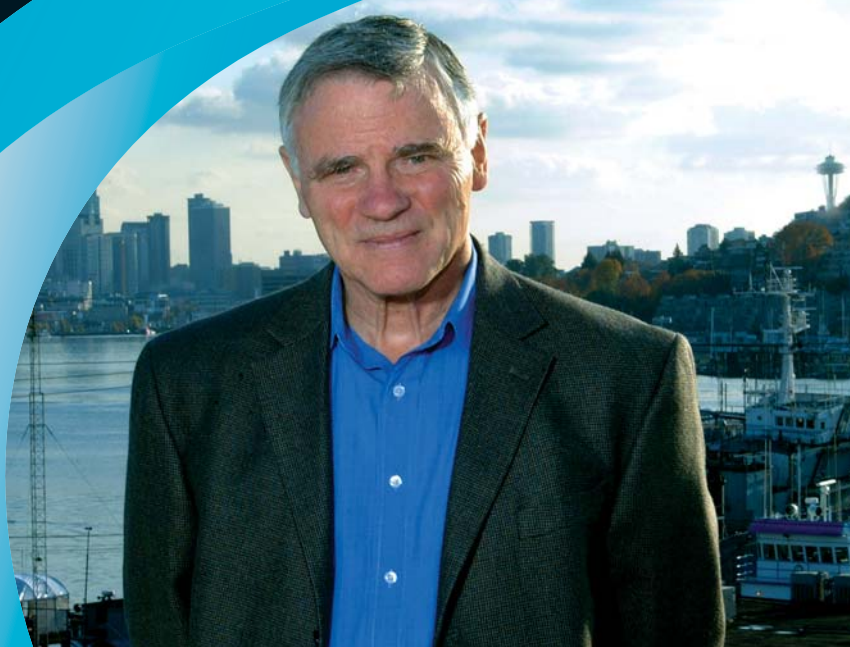
The UK Focus for Biomedical Engineering
Annual Lecture and Dinner

Systems Biology and Medicine:
from reactive to predictive, personalized, preventive and participatory medicine

Speaker: Dr Leroy Hood
President and co-founder, Institute for Systems Biology, Seattle, Washington

The Royal Society of Medicine
1 Wimpole Street
London W1G 0AE

13 November 2007
6.00pm for 6.30pm



The UK Focus for Biomedical Engineering Annual Lecture

Systems Biology and Medicine:

from reactive to predictive, personalized, preventive and participatory medicine

The grand challenge for biology and medicine in the 21st century is complexity. A currently emerging paradigm change is the idea that biology is an informational science and that most biological information is mediated by dynamical biological networks. The systems approach to biology and medicine is a general category of approaches that appear to be very effective in dealing both with biological circuits and hence with biological complexity. Systems approaches require a truly cross-disciplinary environment and the effective integration of biology, technology and computation/mathematics.

Dr Hood will present his views of systems biology and then discuss a systems approach to one disease, prion disease in mice, and demonstrate how it profoundly alters our views of disease - with regard to understanding disease pathophysiology as well as new approaches to diagnosis, therapy and eventually prevention. He will make three predictions: our current, largely reactive, medicine will be transformed to a predictive, preventive, personalized and participatory (P4) medicine over the next 10 to 20 years; this will lead to the digitalization of medicine (extracting information from single molecules and single cells) with even more profound implications for society than the digitalization of communications and information technologies; and, systems medicine and its digitalization will dramatically turn around the slope of ever increasing healthcare costs to the point that the developed world will be able to export its P4 medicine to the developing world.

Dr Hood is a member of the US National Academy of Sciences, the American Philosophical Society, the American Association of Arts and Sciences, the Institute of Medicine and the National Academy of Engineering. He is one of only seven (of more than 6000 members) scientists elected to all three academies (NAS, IOM and NAE). Dr Hood has also played a role in founding more than 14 biotechnology companies, including Amgen, Applied Biosystems, Systemix, Darwin and Rosetta. He is currently pioneering systems medicine and the systems approach to disease.

In 1992, Dr Hood moved to the University of Washington as founder and Chairman of the cross-disciplinary Department of Molecular Biotechnology where he initiated systems studies on cancer biology and prion disease. In 2000, he co-founded the Institute for Systems Biology in Seattle, Washington to continue to pioneer more effectively systems approaches to biology and medicine. Here he has contributed seminal papers to delineating the systems approach to biology and disease and to pioneer developing new technologies (microfluidics/nanotechnology and molecular imaging) in collaboration with colleagues at Caltech and UCLA, that are establishing the framework for medicine evolving from its current reactive mode to a predictive, preventive, personalized and participatory mode (P4 medicine) over the next 10 -20 years.

Programme:

6.00 pm	Registration
6.30 pm	Lecture
7.45 pm	Reception
8.15 pm	Optional Dinner
9.45 pm	Close

Venue
The Royal Society of Medicine
1 Wimpole Street, London W1G 0AE

Dress
Lounge suits

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Registration Form

Please note that you must reserve tickets for both the free lecture and optional dinner. We regret refunds on dinner tickets will not be possible after 1 November 2007 unless the ticket can be reallocated. Ticket price for the dinner is £45 for a three course meal and will be allocated on a first come, first served basis.

I wish to reserve ☐ **ticket(s) for the lecture**

I wish to reserve ☐ **ticket(s) for the dinner at £45.00 each**

Title First name

Surname Honours

Position

Organisation

Address

Postcode

Telephone Email

Dietary requirements

I would like to bring a guest

Title First name

Surname Honours

Position

Organisation Email

Dietary requirements

NB: If reserving more tickets, please list guests on separate sheet

I enclose a cheque* payable to The Royal Academy of Engineering or please debit my credit card* for the sum of ☐ (*delete as appropriate)

Card Holders Name: ☐

Account Number: ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Security Number: ☐ (last 3 digits on back of card)

*Please note we only accept **Visa** and **Mastercard***

Signature Card Expiry Date /

Please return to: Policy Team

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The Royal Academy of Engineering

As Britain's national academy for engineering, we bring together the country's most eminent engineers from all disciplines to promote excellence in the science, art and practice of engineering. Our strategic priorities are to enhance the UK's engineering capabilities, to celebrate excellence and inspire the next generation, and to lead debate by guiding informed thinking and influencing public policy.

The Academy's work programmes are driven by three strategic priorities, each of which provides a key contribution to a strong and vibrant engineering sector and to the health and wealth of society.

Enhancing national capabilities

As a priority, we encourage, support and facilitate links between academia and industry. Through targeted national and international programmes, we enhance – and reflect abroad – the UK's performance in the application of science, technology transfer, and the promotion and exploitation of innovation. We support high quality engineering research, encourage an interdisciplinary ethos, facilitate international exchange and provide a means of determining and disseminating best practice. In particular, our activities focus on complex and multidisciplinary areas of rapid development.

Recognising excellence and inspiring the next generation

Excellence breeds excellence. We celebrate engineering excellence and use it to inspire, support and challenge tomorrow's engineering leaders. We focus our initiatives to develop excellence and, through creative and collaborative activity, we demonstrate to the young, and those who influence them, the relevance of engineering to society.

Leading debate

Using the leadership and expertise of our Fellowship, we guide informed thinking, influence public policy making, provide a forum for the mutual exchange of ideas, and pursue effective engagement with society on matters within our competence. The Academy advocates progressive, forward-looking solutions based on impartial advice and quality foundations, and works to enhance appreciation of the positive role of engineering and its contribution to the economic strength of the nation.

UK Focus for Biomedical Engineering

The UK Focus for Biomedical Engineering provides a forum through which the principal organisations concerned with biomedical engineering can communicate, debate and act jointly upon issues which affect the field as a whole. It seeks to influence high level decision makers in the Department of Health, central government, research funding sources and industry by highlighting the important contribution that biomedical engineering makes to healthcare and by encouraging industry to exploit the opportunities available in this field.

The Royal Academy of Engineering promotes excellence in the science, art and practice of engineering.

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