

Engineering your own path

Prospects are good for biomedical engineers across industry — and there's still room for entrepreneurs, say Ralf Jox and Virginia Gewin.

Although the creation of new institutes and organizations has justifiably gained a lot of press, they are not yet providing many biomedical engineering (BME) jobs. Bodies such as the US National Institute of Biomedical Imaging and Bioengineering (NIBIB) and the European Alliance for Medical and Biological Engineering and Science are expected to create many new jobs in the future. Meanwhile, most graduates find their place in industry.

Europe has about 350,000 biomedical engineers, almost as many as the United States, according to EUCOMED, an association representing European medical-technology companies. The European market for BME, with an annual turnover of €45 billion (US\$50 billion), is led by Germany, Britain and France.

"In industry, biomedical engineers work in corporate research, production, quality control and management," says Katharina Jäger from the human-resources department of Baxter, a global medical-technology company based in Vienna. "University graduates usually acquire leading positions after one or two years, and salaries rise from around €35,000 to €50,000," she says.

Job opportunities in industry will remain good, says Arjen Schat, European recruitment manager of Philips Medical Systems in Eindhoven, the Netherlands. "In the coming years we will need a gradually increasing number of biomedical engineers."

The only European survey so far about career paths of biomedical engineers, conducted by Jaakko Malmivuo at Tampere University of Technology in Finland, yielded a rosy picture. "Eighty per cent of our graduates from 1979 to 1997 were employed in full-time jobs, and one-third moved quickly to managerial positions," he says.

SMALL BUSINESS, BIG OPPORTUNITY

Although jobs in the US biomedical industry have historically been in larger firms such as Medtronic or Baxter, the growth in industrial posts is likely to come predominantly from smaller spin-offs. Indeed, entrepreneurial fever has hit the US biomedical-engineering community. Kyriacos Athanasiou, president-elect of the Biomedical Engineering Society, has himself started four businesses during the past decade.

Athanasiou set up two of his businesses with nothing but venture-capital funding. Over the past few years, as venture capital in the United States dried up, Athanasiou turned to government grants. In the United States, that meant Small Business Innovation



Opportunity knocks: bioengineer Kyriacos Athanasiou has started up four companies of his own in recent years.

Research (SBIR) grants. These provide money through government agencies such as the National Institutes of Health (NIH) to help develop new ideas.

Although there is no measure of how many SBIR grants were devoted to BME applications before the creation of the NIBIB, the innovative spirit that the scheme fosters is evident. Only 13% of applications to the NIBIB in 2002 were for SBIR grants, says Joan Harmon, director of the institute's office of extramural policy. But in 2003, that rose to more than 32%. Currently, funds available for SBIR support comprise 3.4% of the NIBIB's \$280-million budget.

Robert Schmidt, biomedical engineer and entrepreneur, admits that the ultimate pay-off from SBIR companies can be a long time in coming. Following his SBIR funding, Schmidt invested \$10,000 in his fledgling Cleveland Medical Devices — a company that develops physiological monitoring equipment. After six years with no salary, he now has \$3 million in sales a year.

As NIH funding continues to grow, the trend is for grants to be larger rather than more numerous. More than \$1.6 billion of the NIH budget now goes into SBIR. As the NIBIB becomes more firmly established, it is anticipated that funding will continue to increase. "The money follows the talent, and that's increasingly with small companies," says Ann Eskesen, president of the Innovation Development Institute, a leading SBIR think-tank and programme advocate. ■

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Web links

- Baxter
- ♦ www.baxter.com
- Philips Medical Systems
- ♦ www.medical.philips.com
- Tampere University of Technology, Ragnar Granit Institute
- ♦ ee.tut.fi/rgi
- Tampere University of Technology, biomedical-engineering survey
- ♦ www.ee.tut.fi/rgi/bme-survey
- EUCOMED Medical Technology
- ♦ www.eucomed.be
- NIH Small Business Funding Opportunities
- ♦ grants1.nih.gov/grants/funding/sbir.htm