The Future Generation of Bioscientists

Lost or Found?

The level of bioscience education in Finnish universities is high, but the employment rate of bioscientists is worrying. The students need transferable skills to advance their employment, and the biotechnology sector needs governmental support to create jobs and develop into a blooming industry sector.

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Biochemistry students at the University of Helsinki receive a good education, but the employment rate of bioscientists is worrying.

In Finland, about half of the jobs in the biosector are in research in universities and government institutes, the other half in the private sector. Presently the unemployment rate for biochemists, molecular biologists and cell biologists is among the highest for academic professions.

Research groups, especially in biomedicine, have been important employers for bioscience students and offered research and graduate school positions for young MSci graduates.

Problems, however, often arise after the PhD. In the government development plan for education and research 2011–2016, the annual target for the number of doctorates during the planning period is 1,600. The number has increased fourfold in 20 years, and while the number of PhDs has been growing so unfortunately has their unemployment rate.

Today, the joy of achieving the doctoral degree after many years of hard work does not usually last long. The reality strikes, and the small number of positions available both in research and private sector is quite discouraging.

The problem seems to be worldwide. In an article in *BioTechniques*, **David Pittman** writes about PhD students who lose their interest for their original career choice, while academia is not very supportive of alternative choices.

Most PhD students in the sciences begin their studies by dreaming of a tenure-track position at a college or university. But in the end only a handful—less than one in four—are destined to continue on that career path. For this reason, some believe that universities need to re-examine how academic advisors discuss career possibilities and choices with their advisees and, in some cases, alter coursework to better reflect a student's life goals.

Scarce financing a threat for businesses

Several reasons for the lack of decent jobs for young graduates exist. SMEs are important employers in the biotech sector and one crucial factor is the lack of government support for start-up and spin-off companies.

After the Finnish Innovation Fund Sitra in the beginning of the 2000s decided to withdraw its seed financing from life science companies, no other governmental authority has taken its place.

The Finnish Funding Agency for Technology and Innovation, Tekes, has been and still is an important financer, but it does not cover all the needs. There are several examples of Finnish life science companies which were forced to go out of business due to lack of financing, despite the excellency of their IPR, technologies and drug candidates. Clearly no new industry sector can develop and grow without governmental support.

Another reason for the high unemployment rate is the decreased budget for Tekes and the Academy of Finland.

While Tekes finances development of innovations that aims at growth and new business operations, the Academy of Finland is the most important financer

of research in the universities. Lately, the money granted for research groups in universities and research institutes has been cut by millions of euros, subsequently affecting the number of students that can be employed and making it very difficult for young PhDs to get funding for establishing their own research group.

More attention to transferable skills

Although the level of education in Finnish universities and colleges is high, there has been a growing concern about the transferable skills of the graduates. Employers, especially in the private sector, expect a lot more from young graduates in addition to competence in biosciences.

According to a study by the European Chemical Industry Council, Cefic, on transferable skills needed in big chemical companies, intellectual property law skills will remain the most important business skills for future scientists. Since innovative ideas must be protected by patents or other intellectual property rights in order to provide a competitive advantage, innovation management and strategic and visionary management skills will also be critical in creating new innovations and defining long term focus areas.

Coordinated by Culminatum Oy in collaboration with several graduate schools in the University of Helsinki, an ESR project titled PhDs to Business Life currently creates and pilots study modules and operational models for doctoral programmes, improving the correspondence between doctoral studies and working life, and increasing cooperation between doctoral programmes and enterprises.

To improve their transferable skills, graduate students participating in the project are able to participate in courses such as Biotechnology as a Business Environment and Intellectual Property Rights and IPR Strategy. Hopefully some of the students will also become interested in entrepreneurship.

In autumn 2012, the Chemical Industry Federation of Finland and the Finnish Union for Experts in Science (LAL) are starting a joint project in those Finnish universities that educate future chemists and biochemists. The project is designed to draw attention to the transferable skills that are now neglected so that they can be included in their education plans in the future. ❐

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