NATURE|Vol 437|15 September 2005

MOVERS

Albert-László Barabási, visiting scientist, Dana-Farber Cancer Institute, Harvard University, Boston, Massachusetts

2000–present: Emil T. Hofman Professor of Physics, University of Notre Dame, Notre Dame, Indiana
1999–2000: Associate professor, University of Notre Dame, Notre Dame, Indiana
1995–99: Assistant professor, University of Notre Dame
1994–95: Postdoc, IBM T. J. Watson Research Center, Yorktown Heights, New York

Walking through New York City during his years as a postdoc, Albert-László Barabási was intrigued not by the glitz and glamour, but by the notion of the invisible networks of cables and pipes necessary for modern life. Given that he trained as an engineer in Bucharest, Romania, such thoughts were not unusual for the Hungarian native.

But it is the connection between networks and another passion of his — chaos and fractals — that really underpins his scientific career. His fascination for fractals led him to Budapest to work with international fractal expert, Tamás Vicsek. Later, in New York, he married the ideas of the self-replicating patterns in fractals with the structure of networks.

Left to his own devices at IBM, Barabási began asking himself: "What the heck is a computer?" Realizing that everything from computers to electricity distribution to water pipelines is networked, he wondered why nobody in science had paid much attention to networks. "Networks must not be random, but we didn't know anything about them," he says. So he decided to fill in the gaps.

Timing was on his side. The appearance online of digital maps of the Internet and biological networks in the late 1990s became the foundations of his work. The result was two papers introducing the concept of scale-free networks. No matter what system he looked at, Barabási discovered that all networks are dominated by a few highly connected nodes or hubs.

Barabási decided to devote his full attention to networks, even though he lacked both funding and tenure. He credits this bold move with his ultimate success. "I thought this is going to be more important than anything I've done before, I can't do it half-hearted or half-brained," he says.

Now Barabási has his eyes on the next challenge: a theory of complexity. "I believe that if there will be a theory of complexity it will emerge in the next ten years," he says. "How do I position myself to contribute to that goal?"

He is optimistic that his one-year move to the Dana-Farber Cancer Institute at Harvard University, will help him. As the field has advanced, Barabási says, it has become increasingly important to be close to experimental groups generating data.

For those who want to follow in his footsteps, Barabási offers one piece of advice: aim very high. "You'll never reach that very high aim, but if you reach 75%, it's still very good," he says. "If you aim low, 75% gets you nowhere." ■

Virginia Gewin

RECRUITERS & ACADEMIA

A level playing field

Funding pressures from governments have long helped to determine the direction of scientific research. But since the 1980s, the mantra 'publish or perish' has become increasingly pervasive. With more and more scientists competing for the limited space in the high-impact journals that institutions use to assess performance and award jobs or tenure, career progression seems an almost impossible challenge — especially for young scientists.

So, faced with such fierce competition, how does a postdoc gain a fellowship, or even a position in an institute? Grace Wong, chief scientific officer at ActoKine Therapeutics, a biotechnology company in Boston, says that apart from publishing in high-impact journals, young scientists can advance their careers by working with mentors who have strong international reputations (*Nature Biotechnol.* **23,** 265; 2005).

But working in a high-profile lab can brings its own problems. The level of competition can mean that younger scientists may have their work stamped on by senior colleagues. In the top laboratories, discoveries can lead to ugly situations, such as arguments over authorship or credit. And some principal investigators will assign two or three people to the same project to increase chances of success; the first to get the answer gets credit, a paper and perhaps a job. Reputation then becomes a very delicate issue and objectivity in determining scientific output becomes distracting.

Ideally, other measures of success could be used. One suggestion has senior scientists being evaluated not solely on the number of papers they have published, but on how many people's careers they have helped (see *Nature* **434,** 801; 2005). If this approach were embraced, the need to establish senior people in institutes to advise postdocs and students on scientific issues would become greater.

Other possible changes include creating equality within the laboratory instead of a hierarchy, so that each postdoc and PhD student has equal access to the mentor's experience. And establishing clear demarcation for members of the same lab and between labs on a project could remove unnecessary competition, and allow everyone the chance to publish something.

Judging young scientists not just on publications but on other contributions would create a more welcome climate. But this won't happen unless scientific managers are rewarded for creating such an environment. ■

Michael Edel is a postdoc at the Center for Genomic Regulation in Barcelona, Spain.

GRADUATE JOURNAL

The right path

Today, I am up to my neck in neuroscience, as next week I sit my final examination — after 12 months, two research projects, several essays and dozens of lectures. It has been a good year.

Last year I chose not to apply for a programme or scholarship in Germany, my home country. As a result, I ended up here in Oxford. But I think I prefer the approach taken by Anglo-American programmes when they assess candidates for a course. They tend to award positions on the basis of past research experience, a personal interview and the passion a candidate conveys in an interview. Germany, in contrast, tends to be highly bureaucratic. A stack of paperwork and written entry examinations come first. The personal interview is only the last step in the application procedure.

I was afraid of losing out before I reached the interview. Although I had achieved good results throughout my course, the marks were not exceptional. This was partly because medicine covers more than 40 subjects. How could one possibly be interested in all of them? I spent a lot of time in the lab concentrating on what really intrigued me. This fervour helped me to secure my current position. And, more importantly, it showed me that my style of studying is not wrong. ■

Tobias Langenhan is a first-year graduate student in neuroscience at the University of Oxford, UK.