

Getting acquaintTUT

## Destined to become a scientist

"I couldn't see myself in any other profession than as a scientist," says Andre Ribeiro, whose teachers tried to persuade him to become a lawyer, an author or a historian.

Ribeiro is currently in his fifth year in Finland and leading an international, multidisciplinary research group at the Department of Signal Processing. The research interests of the group focus on natural selection and interspecific variation. They conduct measurements using a culture of E.coli in a wet lab that is presumably the only one in the world located in a department that focuses on signal processing.

After completing his doctorate, Ribeiro was keen to pursue "real science" and everything it entails. He sent four emails to four leading scientists and offered to work for them. He got two replies, selected the one that came first and went off to study complex systems under the leadership of Dr **Stuart Kauffman**.

Ribeiro believes that the emails paid off for two reasons. First of all, he was interested in the research fields of the professors and proposed to explore a new avenue of research that was based on their earlier work. Secondly, instead of asking for money, he was asking for support to apply for research grants. For that he needed a project and a supervisor.

"I learned so much in the U.S. I learned to conduct research independently, formulate entire research projects in my head and evaluate them in terms of scientific quality and novelty value."

### From visitor to permanent employee

"I first became curious about **Olli Yli-Harja's** Computational Systems Biology group, when researchers from his group came to visit my group in Canada. Yli-Harja invited me to TUT for a month-long visit."

After arriving at TUT, Ribeiro first pre-examined a dissertation and later landed a two-year employment contract.

"Yli-Harja gave me complete freedom, opened doors and helped me prepare grant applications. I asked if I could get a programmer to help me and got student **Antti Häkkinen**, who is still part of my team. I started out working by myself, writing one publication at a time and contributing to the emergence of a new research area at the University."

### Why are we alike and yet so different?

"I believe that a multidisciplinary approach is a necessity in my field. That's why I've recruited researchers with diverse academic and cultural backgrounds to my research group," says Andre Ribeiro.

Ribeiro's group, made up of physicists, biologists, mathematicians and programmers, is currently exploring intraspecific variation, or why individuals of the same species differ from each other even though their DNA is almost identical, and the mechanisms underlying this variation.



"I carry out research to find answers to questions that puzzle me and because it's fun. However, as the point of research is to generate wider benefits, the themes must be selected responsibly. My opinion is that in a unique research environment we're able to produce unique ideas," says Ribeiro.

WHO: Assistant Professor Andre Ribeiro, 35 years

- Ribeiro is of Portuguese descent but was born in Angola.
- Completed his doctorate at the University of Lisbon in 2004.
- Has worked in Stuart Kauffman's research group in the USA and Canada.
- Has worked in Stuart Kauffman's research group in the USA and Canada.
- Interesting tidbit: Has a black belt in jujutsu. Practised two hours a day for ten years, was a member of the Portuguese national team, trained police officers and soldiers and instructed children in his own club. Gave up the painful sport after moving away from Portugal.

The effects of external factors on cells and cell division are investigated using a biological system that is somewhat simpler than that of humans, namely E.coli. More than merely describing the biological processes found in the bacteria, the group is aiming higher. They are developing signal processing-based methods that enable the numerical representation of bacterial behaviour.

The hard-working group has recently produced a large number of publications.

"When inexperienced researchers join my group, I get them involved in scientific work and writing articles straight away. I give them assignments and responsibilities that I know they can handle. They learn by doing and by working alongside older colleagues and, as a reward, get their name in the publication."

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Text: Kati Vastamäki

Photo: Petri Laitinen

## Discussion about the topic

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