

A high-tech infusion for science

Alex Griekspoor's PhD in cell biology led to an interesting and unexpected twist that resulted in a unique career in computer programming. Now he creates new computer technology using his blend of research knowledge and computer prowess. After bringing the science community programs like Papers and 4Peaks, Dr Griekspoor started his own software company, mekentosj.com and the future looks bright.

mekentosj.com

In this interview with DMM, Dr Griekspoor discusses his experience combining software design and basic science.

How did you discover your talent for computer programming?

It's still a bit of a miracle that I ended up as a PhD student in cell biology. From a young age, I had a strong interest in technology, excelled in physics in high school, and everything suggested an emphasis in technical study at university. Yet, for a variety of reasons, I choose to study biology at the Free University in Amsterdam. Looking back, I am still perplexed as to why I suddenly changed my mind in those last months at high school. Even during my biology studies, I continued to design and build websites, create multimedia presentations, and take on other technical endeavors in my free time to earn money. Upon introspection, evidence of my split personality has been present for a long time. My technical hobbies did make me wonder whether I was going in the right direction by devoting myself to biology, but I never stopped long enough to deliberate on this point when I was offered a position to study for a PhD in immune system cell biology. The intellectual and supportive environment



of the group in which I worked for almost a year as an undergraduate student, made it a logical choice for me to continue this work at the time. Of course, the presence of my colleague and good friend Tom Groothuis, as a PhD student in the lab, added another level of comfort.

At that time, Tom and I were the only two students in the group who used a Macintosh computer (after I had convinced Tom to buy one like mine), and soon our professor started calling us 'Mac' and 'Tosj' or 'Mek en Tosj' as one would say in Dutch. The name stuck because we were good friends and usually if you saw one of us the other wasn't far away, and because the technical Mac skills we developed outside of work turned out to be pretty handy to our research efforts as well. Then Apple moved to its new Mac OS X operating system. This opened the door for people like me, without a computer science background, to pick up programming and build personalized software, thereby providing a porthole to realize one of my long-time interests. My earlier programming attempts had failed from the complex nature of a task that was now simplified. I bought a 'how-to' book, read it on the bus to work and it changed my career.

The programs we made in the beginning were simple, but always driven by an idea to solve a real problem we encountered in the lab. For example: a digital egg timer to prevent us from forgetting long incubations, a restriction enzyme compendium to avoid having to go through all those catalogs from different manufacturers, and a DNA sequence file viewer simply because the manufacturer refused to make one for Mac OS X. The argument was that the Mac would be obsolete within a year or two anyway – right. The real fun started when we launched our own website. We called it mekentosj.com, and started distributing our applications for free. Within no time hundreds, and soon after thousands, of researchers around the globe were using our programs. This gave us tremendous inspiration to do more and more, and soon things grew out of hand.

At this point, I had spent a productive 4-5 years as a PhD student in cell biology. I was quite good at it actually, but my research didn't give me the same excitement that I saw in my boss for example. I struggled to find something that would stimulate my enthusiasm as a postdoc, an area where I could generate the ideas that would eventually create a foundation for my own group. However, the moment I would go home from the lab, my brain was consumed with all the cool things I wanted to add to our programs, and with possibilities for new programs that would be even greater and more revolutionary than our previous accomplishments. It took a while to realize that programming was my true passion, and more importantly, that this is what I should focus on for the future.

The short postdoc at the EMBL-European Bioinformatics Institute (EMBL-EBI) that followed, quickly taught me that a kind of forced hybrid between software development and biology was not the solution. But even more important, it gave me the time and confidence to take the giant leap to leave my academic career and start my very own software company. That's where I am today, still based in Cambridge UK, doing what I love every day: creating novel and innovative software for scientists, changing the way we do research.

Did Tom Groothuis join you in following a path into software development?

Despite our shared programming adventures during our PhD work, Tom decided to continue in academia with a postdoc position at the University of Twente in the Netherlands. I was always the more technology driven person of us and did most of the actual

programming. Tom enjoys rolling up his sleeves to get his hands on benchwork. Interestingly, he did move to a more technical postdoc than his PhD work in cell biology, and I feel certain that he profits from what we did as Mek and Tosj every day.

Do you find that your scientific background is particularly useful to the software development that you do now?

I believe that our scientific backgrounds are the key to the success of our programs. Living the life of a PhD student for six years has given me insight into the way we do science now and what the areas are that need improvement. The philosophy behind our applications is to create what we would like to have ourselves, and then we find out that ours are not solitary needs. This will always be the way we approach software development, and that is only possible with extensive scientific experience.

What are some of your accomplishments that give you the most pride?

Obviously, it was a big honor to win three Apple design awards over the past few years, and it has been great to see our user base grow from a few colleagues in the lab to thousands around the world. This career path has been an exciting roller coaster ride thus far with many highlights, to which many people contributed and there are many to thank. Personally, what I'm most proud of is making the choice to follow my real passion. I can make a bigger impact on science using my programming skills than by continuing to be one of the many PhD students who dreams of his/her once-in-a-lifetime article in a high impact journal. I hope this is only the beginning.

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DMM – supporting the disease research community

Travelling Fellowships

Disease Models & Mechanisms' (DMM) mission is to facilitate clinically meaningful research. This includes providing fellowships of up to US \$5000/£2500 to graduate students and post-docs wishing to make collaborative visits to other laboratories in the interest of medical research.

Here are some examples of what DMM Travelling Fellowship awardees are doing...

Working towards an anti-malaria vaccine

Malaria causes more than 300 million clinical cases of malaria and more than 1 million deaths annually. A basic understanding of the mechanisms involved in the induction of protective immune responses should help in the development of an effective vaccine against the parasite. Using attenuated parasites in a rodent model of infection, **Eva Morath** at the University of Würzburg in Germany is identifying and characterizing new vaccine candidates. Her work includes describing how anti-parasite mechanisms are regulated during infection and vaccination. Her DMM fellowship has exposed her to new concepts and techniques at the London School of Hygiene & Tropical Medicine in the UK.

USEFUL WEBSITES

Nobel Intent: bringing the latest scientific discoveries to a broad readership

With so many exciting scientific discoveries being published all the time, wouldn't it be nice to have them filtered and delivered to you in cogent, understandable prose? The writers for the website Nobel Intent (<http://arstechnica.com/journals/science.ars>) are doing just that. The site's authors are scientists in fields ranging from laser optics to developmental biology and pharmacology, which allows them to identify important developments that don't appear in the wider media. And, when covering stories that do appear in the popular press, their research backgrounds and the flexible format of Nobel Intent helps to ensure that the articles provide details on the experimental approaches and scientific reasoning behind the news.



One goal of Nobel Intent is to present important discoveries to the public in a way that can be easily digested without overstating the data or oversimplifying the message. The website features an area for discussion, which reveals an audience made up of both scientists and non-scientists interested in science, technology and health. The site acts as a conduit between researchers and the public, not by removing necessary technical jargon or avoiding complex issues, but by explaining them.

Nobel Intent is the 'science-centric' subsection of a larger website, Ars Technica. Content on the parent site ranges from detailed descriptions of electronic gadgets to international news. Catering to an intellectually curious readership, Ars Technica provides a great environment for encouraging stimulating and timely scientific discussions. Its staff hope that Nobel Intent can help to educate the public in ways that are not provided by mass media and, in the process, make scientists aware of work beyond their own field of study.

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Uncovering the mechanisms of bone disease

Skeletal remodeling requires the activity of osteoclasts, which are responsible for the resorption of old bone and bone remodeling. However, excessive osteoclast activity is implicated in diseases such as osteoporosis and bone cancers. Understanding osteoclast development is therefore crucial to understanding these debilitating pathologies. **Alexander Barrow** at the University of Cambridge in the UK is investigating the ligands for stimulatory osteoclast receptors that augment osteoclast development and function. DMM recently funded his temporary Postdoctoral Research Scholar position at the University of Washington in the USA to expand his expertise in transgenic mouse models of bone disease.

Research Presentation Grants

DMM is delighted to announce the launch of a new initiative designed to help our authors present their work at conferences and meetings. Research Presentation Grants to the value of \$1000/£500 are available for all first-named authors of accepted manuscripts approved for publication before the end of 2008. The grants are intended as a contribution towards travel and other expenses incurred by the author in attending a meeting of their choice to deliver a presentation or poster based on their published research. We are already beginning to receive positive feedback from recipients of the first grants.

For example, **Néstor Oviedo**, at the Forsyth Health Foundation in the USA, is an author in this issue of DMM and the first recipient of this award. DMM will support his presentation of the data published here, showing the regulation of adult stem cells during tissue regeneration and homeostasis. He uses the model organism *Schmidtea mediterranea*, a planarian that is becoming



Néstor Oviedo is the first recipient of a DMM Presentation Grant.

very popular for its extraordinary regenerative capacity and accessible adult stem cell population. He and his colleagues have determined that the highly conserved PI3K-AKT-TOR pathway is capable of regulating adult somatic stem cells in vivo.

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MEETINGS

The DMM editorial team attends meetings around the world to meet with colleagues and experts to share information about the latest developments in the use of model organisms to advance human health. Here are a few of the meetings DMM staff will be attending in the next few months:

29 September - 4 October 2008	Cancer Stem Cells & Aging, Keystone Symposium, Singapore
29 October - 2 November 2008	Mouse Genetics & Genomics: Development & Disease, Cold Spring Harbor Laboratory, New York, USA
15-19 November 2008	Neuroscience 2008, Society for Neuroscience, Washington DC, USA
13-17 December 2008	48th Annual Meeting, The American Society for Cell Biology, San Francisco, USA
15-17 January 2009	American Society of Clinical Oncology, GI Cancers Symposium, San Francisco, USA

If you would like to suggest other meetings of interest to the DMM audience, please contact us at dmmreviews@biologists.com