

Working for the ‘Dark Side’

NON-ACADEMIC CAREERS IN BIOINFORMATICS

BY: Jon Lerga Jaso

Jon Lerga’s background

Jon studied Biochemistry as an undergrad and continued his studies with a master in Bioinformatics (UAB). He got a PhD in Genetics working with Mario Cáceres at IBB. Meanwhile, he is also studying Mathematics (as if it was not enough). During his studies he got many awards and he holds an almost perfect academic record. He has also done many stays abroad.

Jon Lerga’s professional path

Jon started his career as a PhD student directed by Mario Cáceres at IBB, performing an integrative analysis of the functional consequences of inversions in the human genome. He stayed briefly at his group as a postdoctoral researcher performing bioinformatic analysis of the functional impact of human inversions on gene expression, epigenetic changes and phenotypic variation.

He then changed his professional career upside down, changing academia for industry. He started at TellMeGene as a bioinformatics scientist, and has recently changed to Selfdecode.

Talk’s objective

The aim of this talk was to present a comparison between working in academy and industry. Throughout the talk, Jon presented the advantages and disadvantages of both career paths, under his impression. He wanted to make clear that working in industry is not as bad as people in academia claims, and insisted that academia has indeed its cons.

Content

Introduction

Scientists in academia see scientists in industry as the bad guys, the ones who have sold their science to big companies. On the other hand, scientists in industry see scientists in academia as lazy workers, as they don’t have deadlines to meet. In the end, we are all lost and we just have no idea what we are doing.

Jon’s career

Jon’s career started with his PhD, where he studied inversions, a type of structural variation in the genome. His work mainly consisted in doing bioinformatic analysis of the functional impact of human inversions on gene expression, epigenetic changes and phenotypic variation.

After his PhD he started working in tellmeGen and later in SelfDecode, both companies focused on personalized medicine based on DNA testing and GWAS analysis.

Bioinformatics' industry

There are many businesses where bioinformaticians are needed, not only big pharmas. During this talk we were presented the main areas industry is focusing on, and many different companies where we could find a job as bioinformaticians.

Trending topics in bioinformatics

- NGS
- Personalized health / preventive medicine
- Biomarker discovery
- Omics research and integration
- Synthetic biology / gene editing
- Data mining + statistics + artificial intelligence

Ancestry and heritage

- tellmeGen
- 23andMe
- Ancestry
- ADNTRO
- MyHeritage

Personalized medicine

- Ailin
- MADEOFGENES
- GENOMICS
- KALLYOPE
- Rejuveron
- Kokogenetics (*for dogs*)

Omics

- Sequentia
- Clarivate
- Reamgenics
- Flomics
- Igenomix

Sequencing

- Illumina
- PacBio

Big Pharma

- AstraZeneca
- Sanofi
- Grifols
- Bayer
- Novartis

Academia VS Industry

Many scientists in academia think badly of working / scientists working in industry. On the other hand, there are also many PhD students thinking of moving to industry after their PhD, thinking everything is better “on the other side”. As everything in life, industry is not as bad neither as good as it seems.

During this part of the talk Jon focused on the bad conditions PhD students suffer during and after their PhD, highlighting its impact on students’ mental health. Later on he discussed the pros and cons of working in academia or in industry.

Previous premises

- The debate is not ‘Academia vs Industry’. Many types within each branch.
- Industry != Pharmaceutical industry
- No job is exempt from precariousness, academic or not
- Academic work is not for everyone. Nor is the industry
- There are no first or second class scientists

Mental health of PhD students

One of the main cons of pursuing a career in academia, especially regarding pursuing a PhD, is the effects it has on the mental health of PhD students. It is shocking the fact that 50% of grad students classify as depressed, or that more than 30% show 4 or more psychiatric symptoms, or even that postgrads are 6x more likely to suffer from anxiety or depression than the general public.

After the PhD

People tend to think that after the PhD life improves (*myself a few years ago*), but statistically that doesn’t seem to be the case. The average age of applicants and number of tries keep increasing.

On the other hand, Spain is one of the countries with the best relation between investment in research and scientific outcomes, but we are far from being top and reference in science due to the lack of resources.

Is academia losing popularity?

The problems for PhD students in academia have been increasing lately, and what was a reliable path in the past is becoming a more and more difficult path for scientists nowadays. Increasing working hours, uncertainties in prospects for doctoral researchers, and positive opinions on industry is making an increasing number of scientists to leave academia and go for the industry path. The number of PhDs awarded in biological and medical sciences have been increasing, while tenure-track positions have been decreasing; so it is not feasible for everyone to stay in academia, while it makes the conditions for the ones pursuing this career worse. In the past just by publishing you would be able to obtain a tenure-track position, but nowadays it’s not only necessary to publish in high impact journals, but also sometimes it’s not even enough. Scientists in academia are pressured to publish continuously, which affects the quality and the topics they are able to research on. This also contrasts with the idea of having more freedom in research, in the end, scientists keep working on what their professor or committee wants. On the other hand, people in the industry have experienced lately massive layoffs, so not everything that shines is made of gold.

Summary of pros and cons

ACADEMIA

- Usually lower salary
- Few leadership positions for the number of postdocs
- Flexible schedules (bioinfo vs lab exp)
- You take your work with you wherever you go
- Flexibility in research
- Moral/ethical concerns about science made business
- Lonelier work sometimes
- You take credit for your work
- One-way career
- Advancing in your career is a 'black box'
- Basic or applied science
- More difficult to change job often
- Scholarships and Project grants
- Many times you give classes
- Job instability
- Decisions can take forever if there is not pressure
- Game of Thrones + pressure

INDUSTRY

- Generally higher salary
- More positions for fewer scientists
- Fixed Schedule (or remote)
- 'Work-life' balance
- Less flexibility in what you work
- Commercial focus
- Teamwork
- You don't take credit for your work
- Many opportunities to progress
- You move forward with more reasonable parameters
- Applied science
- Easy to do 'job jumping'
- Administrative work done by others
- You don't teach classes
- More stability in big industries. Not in startups
- Speed in decisions depend on company size
- Game of Thrones + pressure

Take away

During my studies, as everyone in our class, I have only seen the options I have as a scientist in academia. I have only worked in academia or clinical labs, although I am seeing many of my peers moving to industry after their PhD. I work in wet-lab and most of the people I know that are changing their path to industry, are leaving the lab and I+D. Now I know that staying in research in industry is possible in the area of bioinformatics, and that our work is really working in bioinformatics and not selling new drugs, quality control or administrative stuff, which is not bad in any way, I just don't feel is the right path for me. Thanks to Jon I also got to know many companies to work as a bioinformatician.

In addition, I already knew a little about the industrial PhD, but after the talk now I know companies that offer it and that Jon agrees that it is a good option.

Relevant pros and cons of the Industry path for me

Nowadays I work as a lab technician in academia and I do wet-lab and animal experimentation work. My expectations are to start working as a bioinformatician once I finish my studies, which will happen hopefully in two years. So, when thinking about the pros and cons of working as a bioinformatician in industry I am comparing it to my current job.

Some of the pros of industry presented by John, and that I agree on, I am lucky to have them already at my current job, like a quite good work-life balance, stability (my group has quite a lot of funding and they can't live without me) and a fixed schedule (it's even fixed by me to fit my university schedule). On the other hand, both positions share some cons like less flexibility in what I work on and the pressure. Therefore, on the following table I am going to present the main pros and cons that I would find when changing from my current job as a lab technician to a job as a bioinformatician in industry.

PROS	CONS
Generally higher salary	Less flexibility in my schedule
More positions available	I wouldn't take credit for my work: <i>As a lab technician you are not always included as an author in the group's published papers, but that is not the case within my current group</i>
More opportunities to progress	More responsibility (<i>right now I see it as a con, but could be a pro in the future</i>)
Administrative work done by others	Commercial focus
Workload: <i>There are days where the workload is high, but it wouldn't be 100% of the time as in my current job</i>	Moral/ethical concerns
Actually think and design the experiments / analysis performed	

In the future, I would like to become a researcher with focus on bioinformatics and omics. Therefore, I should also consider the main pros and cons, in my opinion, of working as a researcher in industry versus in academia.

PROS	CONS
Generally higher salary	Less flexibility in what you work
More positions available	Commercial focus
Easy to do 'job jumping'	Less autonomy in decision making
Work-life balance	Difficult to do basic science
More stability (<i>only big companies</i>)	No teaching
Administrative work done by others	You don't take credit for your work
Teamwork	Moral/ethical concerns
Less pressure	
Not depending on scholarships and project grants	