Interview with Dr. Matthiopoulos

M: Dr. Matthiopoulos, NK: Nikolas Karvelas, Alex: Alexandra Karvela

NK: To begin with, in order to have everything recorded, could you tell us some things about yourself?

M: My name is Konstantinos Matthiopoulos. I am a professor of molecular biology at the Biochemistry and Biotechnology department of the University of Thessaly. I am currently also the Chairperson of the department and I also am a coordinator at the infrastructure for Synthetic Biology research, Omic Engine. At our department a Synthetic Biology course is provided, which has been well received by both students and teachers and is the first one in a Greek undergrad curriculum. We've also translated a textbook about Synthetic Biology. I've realized that recently more and more students have been getting interested in the field.

Alex: I think that this resulted in the creation of the iGEM Thessaly team this year as well, so we congratulate you for that.

NK: How did you decide to include Synthetic Biology as one of the provided courses at your department and what is your opinion on the field in general?

M: We should always try to see what will be good for the future and what is the direction of biology. In Greece, Synthetic Biology started to become well known just recently.

What I've realized is that to a lot of people it is unclear what Synthetic Biology exactly is. Some confuse it with biotechnology, since you can recombine something that will result in something new. A main and important characteristic of Synthetic Biology is that it can help build systems with orthogonality. This means that you can change something specific without affecting the way that something else works. Also, the design of a research in Synthetic Biology is computer aided, something which is not in the field of biotechnology. Any way, it is not possible to give a specific definition, because sometimes fields can be interconnected.

NK: Which do you think are the biggest concerns about Synthetic Biology?

M: Some product that may be released in the environment and may have negative effects to it. In this case, though, orthogonality helps a lot. For example, if you made an organism with a completely new genetic code and release it in nature, it wouldn't be that harmful, because you know exactly what it needs to live. Synthetic Biology improves the level of prediction in my opinion.

I don't think that someone would use knowledge from this scientific field in order to create a biological weapon. There are cheaper and easier ways to make weapons if you want to cause harm and the already existing weapons are powerful enough.

Alex: What can we do in order to make this field accepted by the public?

M: The most important thing is to raise awareness. There is a lot of scaremongering and people are critical towards anything new. Something that is obvious to the members of the scientific community, is not obvious to everyone. You have to show clearly that what you do can have good results in the society, in order for people to embrace it. It can't be exclusively good or bad, though. It's not only about working in a lab all day that is important.

We shouldn't use this technology though as a first choice to solve our problems, while ignoring easier solutions that are already available. A good example of that is trying to increase agricultural production by making crops that are resistant to specific harmful factors without regulating the food waste at the same time.

There hasn't been enough public outreach by the scientists. There should be extensive discussions between the scientific community and organizations, so that agreements can be reached. This would surely reduce conflict.

Nowadays there are more ways to interact with a wider audience, which could make it easier for that to be achieved.

NK: What other challenges related to the field can you think of?

M: Regarding bioethical aspects, I don't think that there is anything more than whatever has to do with biotechnology.

Maybe we could talk about the case that scientists are trying to "play God". The goal of science is not to do that, but to help in the creation of an organism for example, that will produce something useful. This will happen by understanding first how everything around us works.

Alex: How can we assure the public that we're not trying to "play God"?

M: Communication and explaining everything are the only ways. After that you should always emphasize on the beneficial results of the scientific applications and also becoming aware of the needs of society and work with them in mind.

Alex: What I realize is that there should be some sort of establishment of moral principles in the scientific community first.

M: That's for sure.

NK: In terms of our project, is there something that concerns you?

M: I would only emphasize on the fact that orthogonality can be achieved by a good modelling and design beforehand. Also be careful of your laboratory waste and what you release in the environment that could be potentially harmful.

In general, misuse is not a huge concern of mine.

Alex: Isn't there a chance for it to happen though?

M: Certainly, there is, but how often do we hear about people, for example, who harmed themselves from what we call DYI science? It's rare, but you hear about it a lot when it happens, because it's something that makes an impression. You can't eliminate this danger though, just minimize it.

Alex: Do you think that we should publish only the most important points of a research as a way of preventing direct access to people who wouldn't use it properly and be selective as to who will have full access to it?

M: This would be too complicated. How would we determine then who has the right to access all the information every time? Would we have to sign special contracts? This has been a subject of discussion for years, but since things started working the way they do now in the scientific field, there hadn't been any huge problems. You always have to weigh the advantages and disadvantages.