

We put your questions to Michael after his talk on Tropical Diseases and Drug Creation. This is what he wrote back...

To answer your questions:

1. How successful the efforts to integrate affected communities into the R+D of tropical diseases is, and the general success of tropical disease therapies.

Integration of communities is improving rapidly. Prof. Helen Price at Keele University has led the [ECLIPSE](#) project that empowers communities in Brazil, Ethiopia and Sri Lanka affected by cutaneous leishmaniasis. They have spread awareness about the disease using different forms of media including short films and plays! Here at Sanger, our [Genomic Surveillance Unit](#) have set up a number of Hubs in West Africa. You can keep up with how the fight against neglected tropical diseases (NTDs) is going using the [WHO road map](#). There are some positives to the therapy side of things such as the first licensed [oral drug \(Fexinidazole\)](#) for Human African Trypanosomiasis. However, there of course some areas that are still not doing so great. The livestock disease I spoke about (Surra) is still untreatable in dogs, cattle, and horses if the parasite progresses into the central nervous system. In cutaneous leishmaniasis the main treatment methods involve being prodded with needles every day for 2 weeks which is a horrible experience for all and an un-affordable experience for most. So, we still have a long way to go!

2. What work and how much time goes into a postdoc. What's the application process like.

To qualify for a postdoc, you must have a PhD which is a big commitment in of itself! A lot of work also goes into a post doc, and it can be quite intense. But this is more than worth it due to the freedom you get with the job. You can decide in which direction to push the research, who you want to work with and (here at the Sanger) whether you want your work to be lab or computational based. Expected hours are 9-5 but as you are often doing your own research you can be quite flexible with this (I also work from home 1-2 days a week). A postdoc can be the perfect bridge from you being a student researcher to an experienced group lead with students of your own.

The application process is a little bit different to a normal job. On the Job posting you will see your salary but often a research budget in which you are supposed to use for your research. Some institutes may limit you to certain topics however, I was lucky at Sanger as they were very flexible and left the decision up to me.

At Sanger, I expressed my interest in the role with a CV. I was then invited to create a research proposal which is around 1000 words detailing what I plan to research should I be successful. A panel rated my proposal and I successfully moved onto the next stage. This was a 15-minute PowerPoint presentation on my research proposal followed by 20 minutes of questions on both me and my proposal. I was then offered the job! As you can see it is quite a long process, but the good thing is once you have prepared one proposal you can re-use it for other institutes.

3. More about post-doc research, especially within tropical disease research and researching at the Sanger.

Post doc research is amazing! It gives you a lot of freedom to express your ideas and creativity. If you are interested in NTD research, there are many groups that focus on these diseases across the UK. The [Liverpool School of Tropical Medicine](#) and the

[London school of Hygiene and tropical medicine](#) are 2 specialised institutes in which you can do your master's, PhD, and post doc in the area.

At the Sanger, your research can include both laboratory and computational research and the split is completely up to you. Researching at the Sanger is a little bit different than researching at any other academic institution such as a university. All the groups at Sanger are working towards the same goal of producing lots of genomic data so there are a number of teams available to make sure your work progresses as smoothly as possible. If you don't know what to do for a particular part of your research, there is definitely someone on campus that does! Sanger works on things at a huge scale so if you have big aspirations for your research this is the place to be!

4. I would like to learn more about the importance of genomics when treating different diseases and infections.

Genomics are very important to informing treatment strategies for diseases and infections. Firstly, we diagnose many diseases using the identification of unique genes. For example, the [18S rRNA gene](#) is highly conserved in eukaryotes (meaning most eukaryotes have one) and scientists can usually get a good indication of what organism is causing the infection and what treatment the patient may need by identifying this gene in a sample.

It also helps when researching treatments. For example, if you compared the genome of a pathogen and a human, you would find genes that the pathogen possesses but a human does not possess. You could then investigate what proteins these "pathogenic" genes code for. You could then develop a treatment that targets these proteins. This treatment would be very toxic to the pathogen but (hopefully!) non-toxic to humans. This is just one of the many ways we use genomics to help treat pathogenic diseases and infections