

Amsterdam, December 15th, 2023

Dear Helpathon Helpers,

Thank you for your help. Please find below how I look at the matter and the action we are undertaking.

The Microscopy and Cytometry Core Facility provides its users with access to cutting-edge technologies in the field of Flow Cytometry and Light Microscopy. Our users work on multiple disciplines, but probably the biggest part of our community focuses on Immunology, Oncology, and Neurosciences. One of the most frequent scientific questions that we get is regarding the characterization of tissue heterogeneity, either on tissue sections (microscopy approach) or in single cell suspensions (flow cytometry approach).

To characterize tissue heterogeneity, researchers make use of antibodies against markers that provide an accurate definition of cell identity. More and more, what we see in our core facility is that users have a demand for larger antibody panels. In addition, rarer cell types require antibodies that are often hard to come by or even need to be made completely from scratch. Unfortunately, antibodies are made in animals (typically in mice) and, once made, they are propagated in cell culture media that requires the use of animal products such as fetal calf serum.

It would be great if our core facility could provide our users with access to a large library of antibodies made in an animal-free manner. And even greater if we could generate our own new animal-free antibodies.

One of the ideas received in the Helpathon is that already a lot animal-free antibodies exist in the market; it's only that researchers are not aware of it. An important revelation was the existence of databases where we could direct our researchers to consult whether the antibodies they need are made in an animal-free setting.

Besides encouraging users to look into databases for animal-free antibodies, the idea was suggested to get in contact with companies that manufacture these antibodies and ask for samples that can be made available to our researchers by means of a centralized facility where these samples can be stored. This way, users can check if the antibodies they need are there and test for their own applications and in this way lowering the threshold for adoption of this technology. We are already setting this up in our core facility, and hopefully, the animal-free antibody fridge will be already full with samples in early 2024. Research analyst Taco Waaijman has been tasked with this function, and he is very efficiently reaching out to all kind of companies to collect animal free antibody samples.

However, the bigger challenge is for the development of high-quality antibodies for novel targets in an animal-free manner. This is a challenge because antibodies generated in vitro are typically of low affinity, and that is what animals do best, select antibodies that have high affinity by means of their immune system. Interestingly, recent research has demonstrated that it's possible to create organoids in vitro that mimic the antibody maturation process. Such an organoid platform could be a collaboration with companies

and should be supported by grants to start it up but can eventually become financially sustainable by charging to researchers for the antibodies made available.

We followed up on this idea with several researchers of the Department of Molecular Cell Biology & Immunology (Jasper Koning, Joke de Haan, Reina Mebius, and Sue Gibbs), and we are preparing a grant application to explore this avenue in 2024 with the generous support offered by Proefdiervrij as a matching donation for the grant project.

Altogether, Helpathon #9 was an amazing experience and set up in motion lots of activities that I'm sure will have a tremendous impact in the replacement of traditional antibodies with animal-free antibodies.

Kind regards,

Juan