

Research Blog

“Studying Gut Viruses in ME and Their Role in Faecal Microbiota Transplant”

A Study Update

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As you might remember from my previous blog posts, my PhD’s goal is to investigate the role of viruses in ME.

The project is linked to the RESTORE-ME trial and the Comeback Study, two clinical trials which investigate whether microbiota replacement therapy (MRT) is a safe and effective treatment for ME patients.

The RESTORE-ME trial is under development here at the Quadram Institute in Norwich and scheduled to start early next year.

Meanwhile, the Comeback Study has recently finished.

The Comeback Study was run by Dr Peter Johnsen, Dr Rasmus Goll, and Dr Linn Skjevling.

It took place in Harstad, a small city inside the arctic circle of Norway and recruited 80 ME patients from all over Norway.

We formed a collaboration with the groups of Dr Johnsen in Harstad and Dr Goll in Tromsø, so that I could study gut microbe changes in ME patients in the Comeback Study.

Part of this collaboration involved me travelling to Norway to extract viruses from stool samples, before bringing the virus extracts back to Norwich for further analysis. I feel incredibly lucky to have been given this opportunity as I was also able to meet some fantastic people and explore the outstanding nature.

Visiting Norway

In May 2022, I travelled to Tromsø to work in Dr. Rasmus Goll’s laboratory, who is a gastroenterologist at the University Hospital of Northern Norway and a research group leader at the Arctic University of Norway in Tromsø.

This is where I performed experiments to extract viruses from the stool samples collected during the Comeback Study.

In the end, we extracted viruses from 177 samples, which required a lot of planning and preparation.

This would not have been possible without the support of Ingrid, the lab technician that helped me prepare the lab and assisted with the extractions.

Whilst in Norway, I also travelled to Harstad, where the study was taking place, to meet Dr Johnsen, Dr Skjevling and their colleagues to learn more about the Comeback Study.

Dr Johnsen is a physician at the University Hospital of Northern Norway, who, in the past, conducted a clinical trial investigating the use of FMT for the treatment of irritable bowel syndrome with Dr Goll, when he was a PhD student.

Dr Skjevling is also a physician and is currently undertaking her PhD. It was very interesting to see their facilities and to learn how they organised and conducted the trial.

In turn, Dr Skjevling and some of her colleagues visited the lab in Tromsø, where I showed them how the virus extractions are performed. Though, as I said above, it wasn't all about work, and I had the chance to explore Tromsø and the surrounding areas during my stay as well.

Tromsø is a small city, located mostly on an island between mountainous fjords.

The scenery is amazing. And if you enjoy hiking as much as I do, there are plenty of opportunities, and I got to explore several hiking trails.

It was still early in the season, and although the sun didn't set for the duration of my stay, there was still snow higher up in the mountain, which made for some very exciting treks.

The “Hurtigbåt”, the express ferry I took a few times between Tromsø and Harstad, gives another great perspective on the beautiful scenery of northern Norway. And for the rainy days, Tromsø also has nice museums on the history of the city and arctic Norway.

All in all, I had a great time.

While, at times, there were uncertain and challenging moments, everyone was always ready to help where needed.

I'm very grateful for the hospitality of Rasmus and Peter, who invited me to their house. And of course, for the funding I received from Invest in ME Research and the UEA, as well as a travel grant from the Turing Scheme of the UK government, which made it all possible.

Back in Norwich

When I returned to Norwich, I had to further process the samples and prepare them for sequencing. Sequencing is a process where the genetic fingerprint of each virus is scanned.

With the help of the Sequencing team here at the Quadram Institute, the samples were prepared and sequenced by an external company. This process generates a massive amount of data, which takes a huge amount of time and computational resources to analyse.

We will use a technique called “metagenomics”, which uses computational methods to reconstruct the viral genomes from sequencing data to determine which viruses are present in each sample. In this way, we hope to be able to identify how the composition of gut viruses changes after MRT, and if there are specific changes that correlate with the treatment outcome.

Of course, I won't be doing this on my own, and I am receiving help from our Bioinformatics department, as well as Ernie, who was previously a PhD student studying gut viruses in ME and is now a postdoctoral researcher in our research group.

Meanwhile, I'm also finishing up my other projects and writing up the results for my thesis.

There are several projects that I worked on that lead up to the virome study of the Comeback Study samples. They involved the development of a method to quantify viruses, and the construction of a standard mix of viruses to evaluate the method and to use as a control for the Comeback Study samples.

I also worked with Dr Martin Curran, who is a Consultant Clinical Scientist at Addenbrooke's hospital in Cambridge, to test a gut pathogen detection panel in ME patient samples.

Recently I became Secretary of the Young EMERG committee, chaired by Dr Katharine Seton who was also a Invest in ME Research-funded PhD student here.

Young EMERG was set up in April 2023, forming a network of European early career researchers in the field of ME.

For now, my main priority is to finish the analysis of the Comeback Study samples and to write my thesis, so that hopefully I will be writing my next blog post as Dr Haagmans!

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