

Under the Microscope

Paediatric Gastroenterology Research Team newsletter
Addenbrooke's Hospital, Cambridge University Hospitals NHS Trust

Issue 2

July 2022

HELLO!

Welcome to the second issue of our newsletter - it's been a busy few months!

We held our research strategy meeting in Cambridge. We have these meetings to look forward, think about what we want to accomplish in the lab, and about how we can do it! It was great to have the whole team back together after two years, and we were very lucky to have both patients and parents joining us for the first time - this really helps to make sure we are getting it right!

Our lab member April (she works hands-on in the lab reading, writing and designing research projects) graduated from the University of Manchester, Faculty of Biology, Medicine and Health with her PhD. Congratulations Dr Foster!

We are sad to say goodbye to Aurelie, one of our research assistants. She has moved to Germany to work in a lab at the university in Munich. We will miss her a lot!

Komal celebrated 10 years of working in our lab! She started the team from scratch when the lab was an empty room at Addenbrooke's Hospital! Find out more about Komal in our 'Meet our team' page



...our strategy meeting!



...April

calling all young scientists!

Would you like to explore our lab, meet our team and learn about our work (using our fancy equipment)?

We're excited to announce that we are recruiting a team of young research scientists to help us understand what is important to our patients

We want to invite a small number of our patients (and their families) to join us here at Addenbrooke's at the end of August for an action-packed day of science-based fun!

Interested? Ask your grown up to register your interest at - claire.glemas@addenbrookes.nhs.uk

It's really important you like our newsletter! Scan this QR code to access a short feedback form where you can share ideas and tell us what you think (You can tell us to stop sending you our newsletters here too)



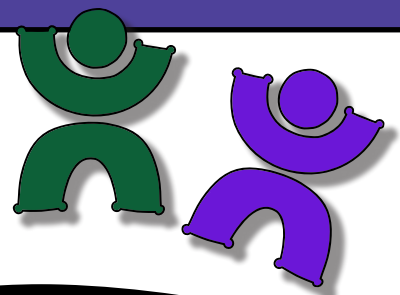
"If we knew what it was we were doing, it would not be called research, would it?"

Albert Einstein

From your newsletter reporter and research nurse Claire Glemas

Illustrated by Jen Rose

Meet our team...



This is where you can learn a little more about us and what we do!

ROB

Hi, I'm Rob. I am a consultant paediatric gastroenterologist, and I mostly look after children with IBD. I have been treating children and young people with IBD for nearly 25 years, the last 15 years at Addenbrooke's.

I really enjoy working together with our clinical and research teams, providing the best treatments we have, but also learning more about these conditions - so that we can find better ways of treating them and getting patients back doing all the normal stuff. I am really committed to helping Matt and our research team understand more about the gut in IBD, as that is the only way we can find better treatments.

Our team also takes part in 'clinical trials' - these are studies where our patients can get access to the latest medicines. The studies are quite difficult as we need to study patients and the effects of treatments very closely - something we just couldn't do without help from Claire, our research nurse.

I spend the rest of my week on a mission to get a children's hospital built in Cambridge. I am helping a large team to get our region its own dedicated hospital for children - Cambridge Children's. It's a very complicated but very important project. We are making really great progress and are hoping to be able to start building in 2024!

"I have twins - a boy and a girl!"

"I love cooking and feeding my friends and family!"



"I'm very scared of earthworms and slugs...ewwww!"

"Now my children are almost grown up I have more time to relax - I like to ride and fix old motorbikes"

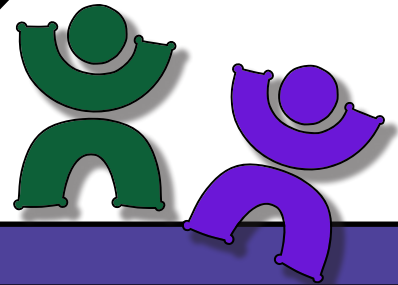
"I enjoy cycling - I often go out with Matt. This gives us time to talk about research ideas and how to improve our service"

KOMAL

Hi, I am Komal and I work in the lab. I have two roles - I work as a scientist and a lab manager! I take the research biopsies that you kindly give us to the laboratory and grow them into "mini-guts" in small dishes. These are called organoids! I then perform experiments on these mini-guts. Since you have IBD, I try to find out about the special characteristics that your cells have that are different from kids without IBD. I also help in the organisation of the lab and make sure we have all the materials, chemicals and fancy equipment to do all our experiments.

Our research...

This is where you can find out more about the studies we are doing!



FOCUS ON...

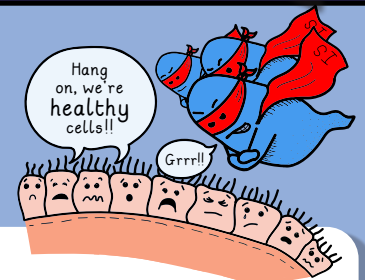
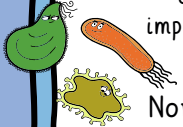
1 MIXED messages!

By Tom Dennison

(why the epithelium is giving out all the wrong signals!)

Did you know that inside all of us an army of millions of cells patrols our bodies, keeping us safe from all sorts of nasty things that try to harm us like germs and viruses? This army of cells is called our immune system. It is especially important in our intestine because of all the nasty bugs and germs that hang around in our pool!

Normally our immune system works really well!



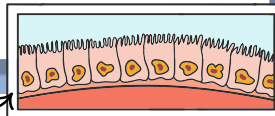
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However, sometimes things can go wrong and our immune system goes into overdrive, attacking everything in sight, including our healthy cells. This is what happens when you have inflammatory bowel disease (IBD)

3

A very important type of cell is called the epithelium - these cells form the lining of your gut. In one way, they're like the outer wall of a castle because they protect our bodies from intruders trying to get in. However, they are also a bit like watchmen that stand on the walls, looking out for enemies. Your epithelium does this by sensing what's going on and sending signals to your immune cells, telling them if they need to get ready for a fight

Epithelial cells



4

But what if your epithelium doesn't send its messages correctly? What if it sends too many signals and calls in your immune system too strongly or at the wrong time?

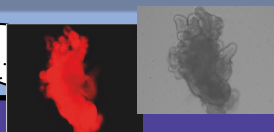
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People who have IBD have more of a molecule (called a transcriptional activator) than normal. We think it might control how many signals their epithelium sends to their immune system, causing it to go into overdrive

Our job was to test this theory!

If you read last month's issue of the newsletter, you'll know that an organoid is like a 'minigut' grown in a dish. Using genetic engineering, we made the organoids produce lots and lots of the transcriptional activator to see if it makes the epithelium send too many signals

(We also made them glow in the dark, so we could see if the genetic engineering had worked properly!)



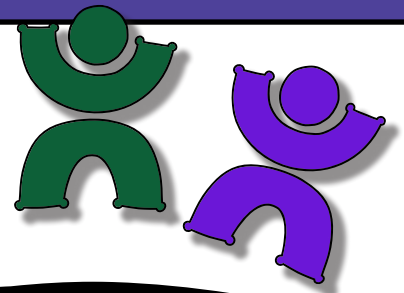
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We were right!

The engineered organoids did send a lot more signals than before. Hopefully in the future this research will help someone to produce a new treatment that stops epithelial cells signalling too much. This will stop the immune system going into overdrive, helping people who have IBD get better



Time to play!



Let's have some fun
(and see what you've
learned!)

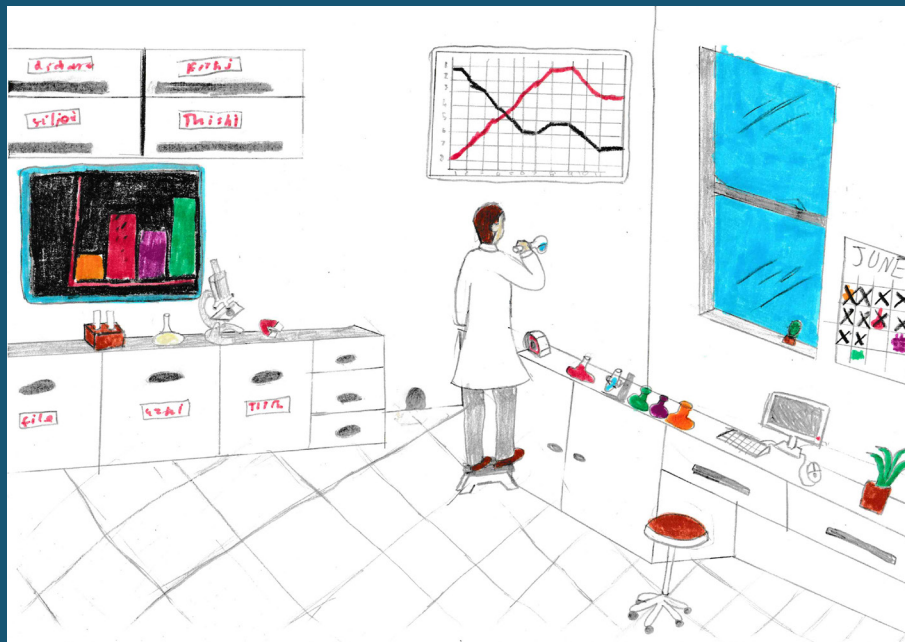
SPOT THE DIFFERENCE

challenge!

Just another busy
day in the lab!

If you look really
carefully there are
12 differences between
these two pictures.

Can you spot them all?



Can you believe these
'spot the difference'
pictures were drawn by one
of our amazing patients,
Luca who is 9 years old!
Thank you Luca, we love
them!

If you would like to help us with
our newsletter too, get in touch
with Claire, our research nurse
claire.glema@addenbrookes.nhs.uk

