



Building reaches
milestone

Why bugs can help patients
who've had transplants

How Jonny saved his
father's life

As the construction reaches a milestone, researchers and patients are focused on the science that will move into the new building.

The good summer weather created ideal conditions for the construction work, which will be marked with a "bottoming out" ceremony later this month.

Meanwhile, two PhD students are looking forward to making their mark with the aid of fellowships to study at the Institute of Immunity and Transplantation (IIT) and talk about the advantages the move to the Pears Building will bring.

Also inside, we talk to Reza Motallebzadeh about how our body's micro-organisms can help the long-term outlook of transplant patients. We also talk to a father who received a life-saving transplant from his son.

Building update and IIT news



Early milestone reached

This month will see a “bottoming out” ceremony to mark the reaching of the lowest point of the site and the beginning of the next phase, when the building will “rise out” of the ground.

“Most people will have heard of a “topping out” ceremony when a building is complete,” said Chris Burghes, chief executive of the Royal Free Charity, which is funding the building. “But we wanted to mark the end of the first phase with this.”

The event will be marked with the deposit of a time capsule that will be embedded in the foundations, designed to be re-opened in 100 years’ time.

The good summer has meant excellent progress on the project, with removal of underground obstructions, construction of the external retaining walls, more work on the foundations and drainage and installation of a tower crane for handling building materials.

Over the next few weeks key work on the foundations and underground drainage will be completed and work on the external retaining walls and external drainage will continue. A new power substation will be installed.

Junior doctors win PhD fellowships

Two junior doctors working at the Royal Free Hospital have won fellowships to study PhDs at the IIT.

Joana Neves, a clinical research fellow at the Royal Free’s kidney cancer unit - one of the largest in Europe - is interested in early stage kidney cancers. “Why do some patients have lesions which never grow yet others have cancers that spread? If the immune system plays a role in this dual pattern of behaviour, is it a failure of the immune system or has the tumour somehow outsmarted it?”

She’s keen for the move to the new building. “Because it’ll be so close to such a large clinic, there’s a real chance to make significant discoveries. And we’ll have the most up-to-date equipment, meaning we can make the most of the precious tissue and blood samples donated by Royal Free patients.”

Joana, who received her fellowship from the Medical Research Council, is “passionate” about improving the outcomes of patients diagnosed with



Joana Neves & Tom Fox

early cancer. “More and more people are diagnosed with early stage kidney cancer. I want to help reduce over-treatment and optimise early treatment.”

Her colleague, **Tom Fox**, another Royal Free junior doctor, who received his fellowship from the Wellcome Trust, didn’t hesitate to choose the “unique” IIT for his PhD in gene therapy for immune disorders. Tom, who’s nearing the end of his clinical training in haematology, said: “It not only has a strong academic record but a unique environment, because specialist clinicians and scientists work so closely, facilitating cutting-edge research.”

He thinks the new facility will optimise collaboration. “The Royal Free labs we’re in are very well equipped, but in the Pears Building we’ll have more people in a building designed specifically for the science.”

The IIT in focus

Reza Motallebzadeh is investigating the role that micro-organisms in our body play in the long-term outlook of patients who have had an organ transplant.

Our bodies harbour countless numbers of micro-organisms including bacteria, viruses and fungi and together they are called the human microbiome (or sometimes microbiota).

Having moved to the IIT a year ago from Cambridge University's Department of Surgery, Mr Motallebzadeh is now looking at the mechanisms underlying acute and long-term rejection of a donated organ.

"I'm particularly interested in the role of the microbiome, which we know communicates with the immune system. We think that disruption to this "crosstalk" can affect the outcome for patients after transplantation, either through rejection or infection."

In a collaboration with the Institute of Child Health, his work involves monitoring a patient's microbiome after kidney transplantation to see how it has been affected by the surgery and attendant treatments, including antibiotics and immunosuppressive drugs.

Improving long-term survival

"Work in cancer immunotherapy has proved that the microbiome has an effect on treatment because of the talk between the microbiome and the immune system. It's also clear that particular cells - T-regulatory (T-reg) cells – can tip the balance towards the body accepting a transplanted organ.

"It's important we get to the bottom of this so we can improve the long-term survival of allografts – the implanted organs – not only for our patients but also for other patients elsewhere in the country, given the shortage of donors. We must make the most of those we are given."

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Another issue is that subsequent transplants are riskier than the first because antibodies that have developed. "For all these reasons we want to improve the long-term survival of every transplanted organ."

Initially his work will look at associations between the make-up of the microbiome and the outcome in patients. The second stage will involve trials using pre- or probiotics to manipulate the microbiome to create better conditions for the survival of T-reg cells.

Era of personalised medicine

The prospect of developing treatments tailored to the individual beckons. "We are entering an era of personalised medicine in which we can tailor tests and therapies to individual patients, optimising the therapeutic effects of treatments while reducing side effects.

"We want to see if we can manipulate the microbiome, reduce the incidence of post-operative infections and tip the immune balance towards cells that can promote graft tolerance."

He is looking forward to the move to the new building. "It will create a fantastic opportunity for collaboration between scientists working in infection and immunology and other academic clinicians. We will have world leaders in immune research who will drive new therapies in transplantation.

"And of course our proximity to the hospital means that we can maximise the opportunities for translational work. Working alongside one of the UK's largest renal and liver transplant centres will mean we can conduct large trials with patients who consent to take part, moving our work forward faster and bringing benefits to more patients more quickly."



Reza Motallebzadeh



Q&A

UCL

with Noam Tamir, whose life was saved by his son

When did you realise something was wrong?

I'd had itchiness for four years and tried all the creams around to no effect. Eventually when I developed swelling in my legs, a blood test was done and it was discovered that I had end-stage liver failure, which was a terrible shock. It was caused by a rare disease called primary sclerosing cholangitis which causes the bile duct to stop working. There's no cure.

What happened next?

My name was added to the system for deciding who gets a liver transplant. As well as having this rare condition, I have one of the less common blood groups and quite soon the question of a live donation from a member of the family was raised as it was feared another liver might not be found in time.

Because the liver has such amazing regenerative abilities, it was possible for my son Jonny to donate 61% of his liver to me, and in a relatively short time, if all went well, we would both have normal-sized livers again.

Were you worried about what it might mean for your son?

I was not at all keen for him to do this for me and I hoped another liver would become available so he wouldn't have to go through such a major operation, not least because of the one in 500 risk that he could die. I did all I could to put it off but my son was determined to do it and wanted to get on with it the day after his accountancy exams!

The surgery was booked for January 2016 and it was quite an anxious time because they needed two intensive care beds, which of course are very scarce. But we were lucky and the surgery went ahead as planned.

How did it go?

The surgery, which took 12-and-a-half hours, went well. And it was a good job that Jonny had been so

insistent because when they opened me up, they realised that I would have had only a month or two to live. They said when they saw the state of my liver they couldn't believe I was able even to get out of a chair. Yet I was walking 8km a day to try to be as fit as possible for the operation.

And how did you feel afterwards?

Within a few days, I was told the doctors were very happy with my liver. Within a month it was fully functioning and within three months it had grown to its original size. It's an amazing organ.

Of course, I have to take immunosuppressive drugs for life and as yet there isn't enough research into whether this can be reduced when the donation is from a family member. But although I had side effects at first, they hardly affect me now. And I'm now walking 11km a day!

I can't thank the team who looked after me enough. Max Malago and Charlie Imber are not only outstanding doctors but also such amazing human beings. They know what matters to patients and how to talk to them. They were absolutely perfect.

What are your hopes for research in this area?

I'm sure that in five or 10 years' time, a patient like myself won't have to take drugs to suppress the immune system – probably to the dismay of the pharmaceutical industry! Instead, scientists will have worked out how to regenerate organs from stem cells, so they will be growing another organ made for you. Of course we'll still need top-notch surgeons, but at least there won't be this fear of rejection.

I also hope that even before that they will be able to work out a better balance of drugs that need to be taken to minimise the side effects. Of course, I don't know about all the research going on in this area but it is amazing to have all this expertise right on my doorstep.