

Science group report on trip to Quadram Institute

On Thursday, 23rd July 2026, 16 members of the U3A Science Group visited the Quadram Institute on Norwich Research Park. Quadram collaborates with a wide range of organisations both on and off the Research Park into aspects of human nutrition, our microbiota and their effects on our health in older age. No wonder we wanted to know more!

Andrew Chappell (Communications Manager) our contact there, not only organised speakers and tours of the facilities but also sent images to show the entrance and drop off points and car parking (the cost of which Quadram covered). We all appreciated such attention to the Visitor Experience – after all, who wants to preface a visit with an agitated search for parking and the way into a huge building in a complex of huge buildings!?

The Quadram Institute opened in September 2018, with clinical facilities (they have an endoscopy suite) opening soon after, and was formally opened by Sir Patrick Vallance on February 6, 2023. The Princess Royal has become its Patron. Inside the striking looking building, the first impression is of big open space, very high ceilings and lots of light since many internal walls are glass. There are physical features reflecting aspects of the gut structure, and a layout designed to encourage random contacts between researchers where new ideas get sparked. In the large laboratories (which we toured, in two groups, so allowing plenty of opportunity to ask questions) researchers from several disciplines work together and share facilities. There is also a staircase apparently designed to encourage stopping en route for a chat - not quite sure how this works! Amongst the innovations from when I worked in a laboratory, is a double lift shaft so that those entering the laboratory in their freshly laundered lab coat travel up in the Clean Lift and those leaving in the Dirty Lift, the walls of which are completely covered by detachable and so washable cloth.

In his introductory talk Andrew Stronach (Head of External Relations & Engagement) told us of Quadram Institute's International collaborations and with others on the Research Park eg John Innes, Earlham Institute, UEA and Norfolk and Norwich University hospital (in particular their premature baby unit; premature babies are frequently delivered by caesarean section and consequently miss the vaginal birth exposure to microbiota which is now known to be vital to their thriving).

Their combined research into biofortification (ie foods with enhanced nutritional value) has already led to the commercialization of beneforte broccoli, a soft drink with a high fibre content (and we all know how important fibre is to our general health via our microbiota) and hydroponically grown pea shoots with added vitamin B12. Vitamin B12 is vital for many functions including production of healthy red blood cells and for nervous system function where deficiency can manifest as memory impairment and even psychological problems of confusion and dementia (*NHS website*). Vitamin B deficiency is a risk for vegans particularly women since menstrual blood loss exacerbates the risk of anaemia.

They have also produced tomatoes that supply vitamin D, (not a natural component of tomatoes).¹ There are chemical ways of assessing vitamin D level in tomatoes but proof it is

¹ See Sandy Langford's talk on Solanaceae, last year!

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absorbed from the gut needs lots of people eating normal and enhanced tomatoes (as soup) and subsequent analysis of various bodily fluids. This work has patent rights protection, in the hope some large company will buy it, thereby generating money for further research.

Other areas of research include increasing the nutritive worth of potatoes and the use of phages in livestock as an alternative to antibiotics.

Paul Lonsdale (Research Scientist), described his research into the influence the gut microbiota has on the eye and brain of mice as they age. (Very gratifyingly Paul said he had looked up Halesworth U3A Science Group online and was much impressed by the recent talk on microbes given by Connie Topping). The variety of organisms in the gut microbiota diminishes with age in humans and in mice for as yet unknown reasons. Sight and brain acuity also decrease in older humans and mice, possibly reflecting chronic inflammatory states. The question posed then is, is this correlation or causation. Having established a suitable marker protein that decreases with age, the experiment was to transplant faecal microbiota (ie FMT procedure) from young mice into older ones and assess the effect if any on the protein markers. With some very impressive photomicroscopy images using fluorescent dyes, Paul showed this young to old transfer of the wider range of microbes resulted not just in halting the loss of these marker proteins but even restored them and so “rescuing” the organ function. Although this is not expected to be a one-off fix for such age-related degradation, it may provide a treatment analogous to the routine drug regime many of us have to deal with our ongoing health issues. The next stage is to test if the treated aged mice can see and think better than placebo treated old mice.

The next talk, by Yasmin Briddon (Project scientist) was a delightful discussion of poo. Yasmin explained that she had a glass and tube model of the colon enabling her to alter the components of the microbiota. Anaerobic gut bacteria ferment dietary fibre into short-chain fatty acids (SCFAs) like butyrate, acetate, and propionate, which in turn provide energy for colonocytes, supporting gut health; surplus energy is used by the rest of the body. Yasmin explained that microbes do more than just aid our digestion of food; for instance, they influence the absorption of vitamin K, a vital part of the blood clotting cascade. It was interesting to learn that everyone’s microbiota is unique to them.

Participants in her studies donate their ‘poo’ which is graded according to the Bristol stool chart (available online!). A current research line is into the bacterial conversion of choline (a vital substance) into TMA (trimethylamine) a gas that in turn can be converted in the liver to TMAO, a substance associated with cardiovascular disease. Her research involves adding pomegranate juice to her artificial colon with its microbiota to see if it reduces TMA production and so might be protective against CVS disease.