Department of Twin Research & Genetic Epidemiology (DTR)

TwinsUK newsletter

May 2017

Welcome

to our 2017 newsletter. Last year was one of our most successful years to date and we are proud that we are one of the most highly profiled departments at King's College London. Our findings last year were disseminated world-wide through 315 news articles, 27 radio programmes and a record-breaking 13 TV programmes - spreading the word about the importance of twin research and the difference that volunteers such as yourselves can make to science and health advancement. Thank you to all of you who have been in for visits, sent samples as part of the flora study or answered questionnaires; our success is entirely down to your commitment to twin research.

Best Wishes

PROFESSOR SPECTOR'S BIG NEWS

We are proud to announce that Tim Spector, Director of TwinsUK, has been elected to the prestigious Fellowship of the Academy of Medical Sciences. This is a great accolade that recognises Tim's contribution to medical research and healthcare and its translation into benefits to society. This achievement would not have been possible without the support of all our twins over the years.

TWIN VISIT UPDATE

Over 1500 of you have now completed our full day visit since we began just over a year ago.

"The visit was extremely well organised and structured."

"The staff were very warm and professional."

"It has been an amazing day and it was great to meet other twins over a lovely lunch."

Many of you have given us lovely feedback. We have also listened to your suggestions about ways to improve the visit further and make it even more enjoyable for you.

QUESTIONNAIRE

Most of the work that we do takes place over many years as we study changes in health over time. This is called "longitudinal research" and is a very valuable form of research. Our large health questionnaire which is enclosed with this newsletter and which we send out every 2 years, is the perfect way to keep up to date with any changes in your health and life-style. We would be very grateful if you could complete the questionnaire as the success of our research rests on this up to date information about you. If you return it by the 30th June, you will be entered into an iPad mini prize draw as a token of our appreciation.

At the twin visit, you may be asked to donate some of your saliva. We appreciate your efforts with this as it is becoming very important for our research. Many ancient medical cultures look to the mouth to detect changes relevant to general health - and biomedical science is just starting to catch up! Not only is saliva used for our microbiome study to better understand how we co-exist with the bacteria that live on and in us, it's also relevant for dental studies, and wider health impacts. One day we may be able to use it instead of withdrawing blood, as it too contains DNA and important biochemical markers.

HEALTHY GUT COLONOSCOPY RESEARCH

As part of our important work on gut bacteria (microbiome), we are fortunate to be able to further our understanding of the gut through our colonoscopy research. As such, we are offering identical twins the opportunity to come in for a colonoscopy (BUPA average cost equivalent £2350). This research will investigate how our microbiome interacts with our immune cells and affects our health. The study includes removal of any potentially premalignant polyps (as has happened in a number of cases).

"We are very pleased we took part in the colonoscopy research, it was not nearly as bad as we thought. Thank you for looking after us."

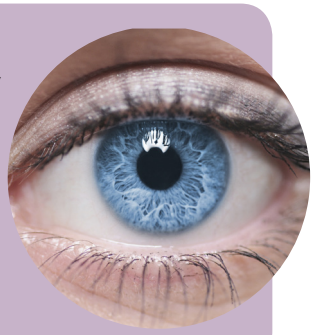
To take part, you must be an identical twin pair, aged 40 and over; both willing to participate. There must be no history in either twin of type 1 diabetes, rheumatoid arthritis or colon cancer. Nor should either of you be on any blood thinning medications. For more information please visit www.twinsuk.ac.uk/colonoscopy/colonoscopy-study-details/ To register your interest please visit www.twinsuk.ac.uk/colonoscopy/

If you haven't been for a visit for four years and would like to arrange one, please contact us

020 7188 5555 **twinsuk@kcl.ac.uk**

SPOTLIGHT ON TWINSUK RESEARCH

IMPORTANT EYE FINDINGS



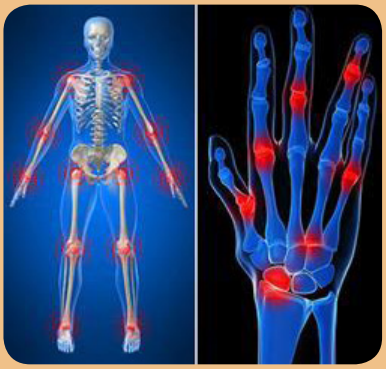
Those of you who have been for a twin visit know that eye tests are a very important part of our research. All the eye data you have provided has recently led to some very significant findings. Our research team have discovered for the first time that higher dietary intake of vitamin C can reduce cataract progression. Simple dietary changes such as increased intake of fruit and vegetables as part of a healthier diet could help protect us from cataracts. Your eye results have also contributed to a new collaborative study with the charity Fight for Sight which is aiming to identify the main genetic factors in the development of glaucoma, a serious eye disease causing irreversible blindness and which affects millions of people in the UK and worldwide. The researchers leading the study discovered three new inherited genetic changes that are linked to the development of this condition. The results were published in the prestigious journal, Nature Genetics.

GENETICS PLAY A SIGNIFICANT ROLE IN IMMUNITY

Our research, recently published in the important journal, Nature Communications, adds to a growing body of evidence that the genetic influence on our immune system is significantly higher than previously thought. The research, supported by the NIHR Biomedical Research Centre at Guy's and St Thomas' Foundation Trust and KCL, analysed 23,000 immune traits in 497 adult female twins from the TwinsUK cohort. The study also showed the importance of environmental influences such as our diet, on shaping how well our immune system functions as we get older. The findings could influence further research into treatments for conditions of the immune system such as rheumatoid arthritis and psoriasis. "Our results showed just how genetic most immune responses are. What this means is that we are likely to respond in a very individualised way to an infection such as a virus – or an allergen such as a house dust mite causing asthma. This may have big implications for future personalised treatments." Professor Spector said of the research.

NEW STUDY SHOWS ROLE OF PROTEIN IN RHEUMATOID ARTHRITIS SUSCEPTIBILITY

Rheumatoid arthritis (RA) is an autoimmune disease that causes inflammation in joints. At the Department of Twin Research, we have been studying RA for nearly 25 years. Recently, research at the NIHR BRC at Guy's and St Thomas' NHS Foundation Trust using TwinsUK data has shown that a protein called PTPN22 behaves differently in people with rheumatoid arthritis by becoming 'sticky' and causing an inflammatory response. Further research is needed to better understand its role in RA. This insight could lead to better treatments for people living with this painful condition, and ways to prevent it from developing.



ACNE SUFFERES' CELLS MAY BE PROTECTED AGAINST AGEING

Dermatologists have long noted that the skin of acne sufferers appears to age more slowly than the skin of those with no history of acne. Signs of ageing such as wrinkles and skin thinning often appear much later in people who have experienced acne in their lifetime. Our researchers may have discovered why this is the case as they have recently shown that people who have previously suffered from acne are likely to have longer telomeres (the protective repeated molecules found at the end of chromosomes) in their white blood cells, meaning their cells could be better protected against ageing. The study, published in September 2016 in the Journal of Investigative Dermatology, measured the length of white blood cell telomeres in 1,205 members of TwinsUK.

HOT OFF THE PRESS HOT OFF THE PRESS HOT OFF THE PRESS HOT OFF THE PRESS HOT OFF THE PRESS

HOT OFF THE PRESS

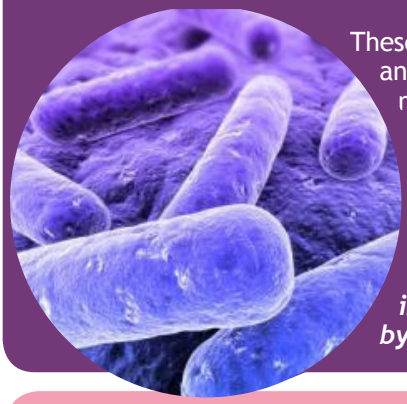
The gut microbiome is the complex community of microorganisms that live within our guts, and may have a significant impact on our health. Our diet is thought to be one of the factors most associated with whether we have a "healthy" gut microbiome or not. Using dietary questionnaires and data from over 4000 twins we have created a "healthy diet score". This will make it much easier to investigate other influences on our microbes and will allow researchers to see how wider environmental factors, such as air quality and soil pollution in different parts of the country may affect our microbes. We plan to publish these results shortly and hope they will be recognised as an innovative way to study associations with the microbiome.

SPOTLIGHT ON TWINSUK RESEARCH

DIVERSITY: THE SECRET OF LIFE

The world's oldest man, Yasutaro Koide died last year at the age of 112. The news of course, reported on his "secret to longevity" which was not smoking, drinking or overdoing it. No surprises there! But here at the Department of Twin Research we are trying to answer this question on a much bigger scale; we'd like to know why some older people stay robust and fit well into their 80's and beyond, while others become debilitated and dependent. To this end, recent scientific interest has turned to investigating the factors that predict frailty which is a measure of how physically and mentally healthy an individual is. Studies show frailer older adults have increased levels of low grade inflammation and it is now thought that our immune and inflammatory systems are trained and educated in our gut, through key interactions with gut bacteria.

So we asked if changes in our gut bacteria could be part of the process of inflammation driving frailty by studying the bacteria in 700 stool samples that members of TwinsUK have generously donated. Our work found that the frailer an individual, the lower the diversity of gut bacteria they have. Specifically, we found that a group of bacteria called Faecalibacterium prausnitzii, were found in higher amounts in the healthier twins. This is a particularly interesting microbe as it has been linked with good health in many other diseases such as inflammatory bowel disease and is believed to reduce inflammation of the gut. Could this bug help protect against frailty? Conversely, other types of microbes were seen in increased amounts within the frailer twins; such as Eubacterium dolichum, which has been linked to an unhealthy Western diet.



These results suggest that dietary changes might be an easy way to encourage healthy ageing and suggest that if you want to age well you should perhaps do fewer crosswords and spend more time looking after your microbial garden. Eating plenty of plant fibre and food that we know are good for our gut health such as fermented foods e.g. sauerkraut and pickles and unprocessed yoghurts, as well as a diet high in fibrous vegetables (that the healthy bacteria love) such as chicory roots, Jerusalem and globe artichokes, leeks, onions, garlic, celery, bananas, apples and pears.

This article was adapted from a longer version of the article "Keen to be healthier in old age? Tend your inner garden"; published online www.theconversation.com/uk by Claire Steves and Tim Spector

Further research on the microbiome using 1,313 members of TwinsUK showed that people with diverse bacteria in their stools had lower levels of visceral fat. Visceral fat is body fat that is stored in the abdominal cavity near a number of important internal organs and is linked with higher risks of metabolic diseases such as cardiovascular disease and diabetes. Further research is needed to show how our gut microbes influence human health and weight, and whether we can optimise our gut bacterial diversity for better health and weight.

BIORESOURCE UPDATE

As many of you know, in 2012 the DTR was delighted to be offered the opportunity to integrate the TwinsUK registry with the prestigious National BioResource, a government initiative funded by the National Institute for Health Research (NIHR) through local Biomedical Research Centres (BRC's) - the research arm of the NHS - in order to 'translate scientific discoveries into improvements in treatment which will benefit patients at the earliest opportunity'. The research aims to understand better how our genes interact with the environment resulting in disease, and to develop new drugs and treatments. The BioResource in just 4 years has already had a number of exciting discoveries. This includes research that has shown novel approaches to treating alcohol addiction, new protocols for avoiding the spread of contagious diseases in hospitals, a greater understanding of why the immune system misbehaves in autoimmune diseases and the changes in the brain that occur as we age. The good news is that Guy's and St Thomas' and King's College London BRC has just been awarded a renewal from April 2017. The twin visit data contributes to the BioResource as do smaller twin studies that you may be asked to take part in. You can read more at www.bioresource.nihr.ac.uk

Guy's and St Thomas' BioResource

MY TWIN VISIT HEALTH ALERT

"After our twin visit in December I received my clinical results in the post and was recommended to follow-up with my doctor over a number of findings. My DXA scan result suggested a problem, and as a result I have been diagnosed with osteoporosis and am now on medication. My cholesterol was also found to be higher than it should be. Finally, the researcher conducting the eye test was concerned with one of my results; sure enough this was confirmed by my eye specialist and I have been diagnosed with early stage cataracts. I am very thankful to the DTR as these issues could all have gone undetected and caused problems in the future. Keep up the good work Research Team - as we all benefit from coming for a visit." (Sue Bailes)

INTRODUCING AYRUN NESSA OUR CLINICAL OPERATIONS MANAGER

Ayrun has been an integral member of the Department of Twin Research for the past 14 years initially working as a Lab Assistant, and then joining the Clinical Research Team, ultimately progressing to her current role, leading and overseeing twin visits. During this time, Ayrun has worked tirelessly to improve twin visits by developing, implementing and rolling out new visit structures and working with all the researchers and teams within the DTR to pilot new research tests, and most importantly to ensure that all ethical and legal standards are strictly maintained at all times. In Ayrun's words ***"It's great to have been working here for so long, interacting and often seeing the twins more than once during repeat visits. Thank you to the twins for making my job so enjoyable."*** And thank you to Ayrun for making sure everything runs so smoothly and giving the twins such a rewarding experience during twin visits.

OUR HAPPY PRIZE WINNERS

Every-one who actively participates in our research is entered into an iPad mini or voucher prize draw which takes place several times a year. John was thrilled to win an iPad mini for the new volunteer prize draw, and Sue, an existing member of TwinsUK, won the prize for referring a new twin pair.

"It was an awesome experience to participate in twin research. The research staff were all charming and attentive and we were well looked after. It is great to have had the opportunity to participate in health research and I am proud to have volunteered to help TwinsUK. An added bonus was winning the iPad. Much appreciated!" - John

"I never win anything so this came as a complete surprise. Thank you so much! I was also happy to hear that my friend that I recommended to join TwinsUK really loved her twin visit and enjoyed meeting other twins over lunch as well" - Sue

LOOK OUT FOR OUR NEW TWINZONE WEBSITE LAUNCH

We are excited to be launching a new portal through our existing web-site, especially for members of TwinsUK. It will include information about our research from the practicalities of taking part to the science behind it. There will be interesting links to books about twins, twin web-sites and blogs as well as different ways people can support us from giving their time to helping us to raise much needed funds. In the future, there will also be a LOGIN section dedicated to TwinsUK members taking part in research. So look out for its launch in the next few months!

CDRF

Many of you will know of our close relationship with the medical research charity, the Chronic Disease Research Foundation (CDRF) which has provided funds for a wide range of studies, including arthritis, back pain and migraine research. In November 2016, the CDRF awarded us three years of funding to allow our department to undertake the world's largest study of the microbiome found in urine and how it relates to frailty and illness in older people. Previously, DTR staff and dedicated twins have raised money for the CDRF by completing a triathlon, running a half-marathon and completing a 273 mile walk along the Greenwich Meridian Line. If you are planning to fundraise or take part in an extreme challenge, or even leave a legacy in your will, and would like to raise money for the CDRF, please contact info@cdrf.org.uk

CHANGE OF DETAILS?

If we don't have your current email address or to update your contact details, please email **twinsuk@kcl.ac.uk** with your full name and date of birth or call **020 7188 5555**

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