

## Department of Twin Research & Genetic Epidemiology (DTR)

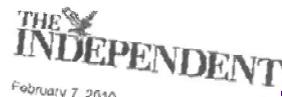
# Newsletter 2010

**Welcome** to another incredibly exciting year at the DTR. We have published an unprecedented number of papers in world-class journals such as Nature and Nature Genetics - none of which we could have done without your help. Our new discoveries include the genetic aspects of ageing and vitamin D levels, new potential tests for osteoarthritis and the

advantages of being a garlic lover! All of these are discussed in more detail in the newsletter. We are coming to the end of our Healthy Ageing Twin Study (HATS). Over 3000 twins came to the DTR to take part in this ground-breaking research to find the genetic and environmental factors that cause health ageing. Watch out for the coming results of this study.

Finally, we are about to embark on the "EpiTwin" project - to capture the epigenetic differences between 5000 identical and non-identical twin pairs (see page 2). Thank you as always, for your enthusiasm, time and support. It is much appreciated by us all. Season's greetings!

*Tim Spector*



February 7, 2010

**Genetic test for ageing may soon be possible**  
By Steve Connor, Science Editor

In breakthrough research, the DTR and the Universities of Leicester & Groningen, identified genetic variants associated with biological ageing, as reported in Nature Genetics and newspapers world-wide. As Professor Tim Spector explains *"some people are genetically programmed to age at a faster rate. For these people ageing may accelerate even faster if they do not lead a healthy life-style."*

## DTR news - Read all about it!



Observations - June 10, 2010  
Vitamin D deficiency linked to genetic polymorphisms

The DTR and Harvard University published a paper in the Lancet that was reported widely in the media, showing that genes play a role in determining our blood levels of vitamin D, crucial for musculoskeletal health. It was originally thought that vitamin D levels were determined solely by sun exposure and diet, but in this study 3 genetic variations were found to be associated with vitamin D concentrations. Professor Tim Spector comments: *"The improved understanding of how vitamin D levels are determined could help to identify those who are most at risk of vitamin D insufficiency and who may need extra supplementation."*

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**A list of our publications can be found on <http://www.twinsuk.ac.uk/publications.html>**



**DTR award!** The DTR is proud to have been presented with the King's College London Project of the Year Award for our work in ageing research. The award was collected on behalf of the department by a member of the DTR, Dr Massimo Mangino, who played an instrumental role.



# ARTHRITIS TESTS HOPE

Osteoarthritis (OA) mainly involves the joints of the knees, hips and hands and is the most common type of arthritis in the UK. OA affects an estimated 8.5 million people in the UK alone, and the DTR has found a new potential test for it! So how did YOU help? In breakthrough research, the DTR compared the ratios of biochemical markers in the blood of women with OA and women without OA. We found that the ratio of two biomarkers were different between the groups. We hope that further research will allow our findings to be incorporated into a screening programme, enabling doctors to diagnose and treat OA earlier, with the advantage that invasive x-rays and scans would not be required - just a simple blood test.

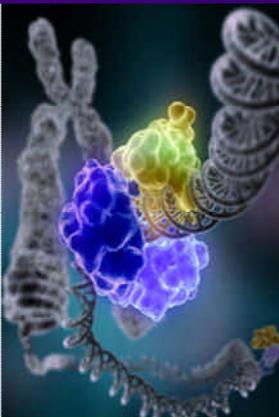
Frances Williams from the DTR and Alex MacGregor from the University of East Anglia are about to publish a large study showing that twins with diets high in alliums (garlic, onions, leeks etc) have less degenerative change at the hip than twins who eat low levels of these foods. This study used the food questionnaires that many of you will have completed together with hip x-rays. The researchers believe that a chemical in the allium family protects against cartilage degeneration. So break open the garlic bread!!

 We are now registered with the Office of National Statistics who update us automatically when twin volunteers experience a major life event such as death or cancer. This was approved by our volunteer advisory panel in March (see page 3). Please do continue to tell us about any such major life events by calling 0207 188 5555.



**Hats off to the HATS study!** A BIG thank you to the 3000 of you who first came to the DTR at least 12 years ago, and returned for another visit as part of our Healthy Aging Twin Study (HATS). We received funding from the Wellcome Trust from 2006 until the end of the study in 2012. Now we must analyse the data to determine the importance of genes and lifestyle factors in the ageing process, find genes associated with how our eyes, lungs, heart, muscle and bone function, and find out whether different parts of our bodies age in unison or at different rates. Everyone is waiting for the results of this fascinating study. Many thanks to all who contributed.

## Your environment may influence your genetic well-being!



**Epigenetics** is a cutting edge emerging field in genetics, and explores how the actions of genes can be temporarily modified – ‘turned on or off’ - by chemical reactions that occur either at random or as a result of lifestyle. We are about to launch “Epitwin” - the largest ever epigenetics project to capture the epigenetic differences between 5000 twin pairs. These differences may help to explain why many identical twins don’t develop the same diseases. The project is a collaboration between the DTR and Beijing Genomics Institute, one of the world’s largest genomic organisations. The teams hope to discover key therapeutic targets for the development of effective medications, and will focus initially on obesity, diabetes, allergies, heart disease, osteoporosis, arthritis, pain and longevity. It is funded by the European Union.

## So how do we do all this research?

Here are the logos of our funders. Without their support none of our research could take place. All studies pass through rigorous ethics approval and are subjected to the same level of anonymity. If you wish to contribute to this research directly via a charity, you can do so through the Chronic Disease Research Foundation (which will direct all contributions to the DTR) by calling 44 (0)20 7633 9790 or **FROM JANUARY 2011** go to <http://uk.virginmoneygiving.com/charities/cdrf>



## New studies at the DTR

Although HATS is coming to an end, we have many interesting and varied studies in the pipe-line. Please note that **we will contact you** if you are eligible for the allergy and medication study described below. The UK10K study and the Epitwin study (page 2) are already underway using data that we have already collected.

### Allergy Study



Many people in the UK have allergic conditions. Current allergy screens are not specific enough and we are about to start a new study to try and identify genetic susceptibility factors for food, respiratory and skin allergies, in the hope that such information will identify people at risk and help in the development of effective therapies. This study includes blood testing for specific allergens and a patch test that has to be worn for 2 days. It is funded by NHS Research - NIHR.

### Medication Study



**How does your body respond to the medicine you take?"** Dr Ahmadi at the DTR is starting a new study that aims to understand why people respond differently to medication. If you are a twin on prescribed medications, you **may** receive a letter asking about your condition before and after starting the medication. In some cases you will need to get some added information from your GP.

### Exceptional Experiences



**Have you and your twin shared "exceptional experiences"?** In the past some of you may have answered questions on exceptional experiences. The initial results were very exciting and our collaborators at Gothenburg University are delving further into this fascinating field. If you have experienced shared physical sensations, telepathy, extremely unlikely coincidences (more unlikely than wearing similar clothing), please email [goran.brusewitz@bredband.net](mailto:goran.brusewitz@bredband.net) including your full name and date of birth; or write to Göran Brusewitz, Diligensvägen 98, S-13148 Nacka, Sweden, including your full name, and address (IN BLOCK CAPITALS PLEASE), and your date of birth. He will then send you a questionnaire. **Please use your first name (full) and surname that we use in our correspondence with you.**

### Family Twin Study



**Do twins run in your family?** As a twin, do you have another close relative who is a twin (either one of your parents and / or any of your children)? If you would like to take part in a new and exciting study looking at how our genetic make-up changes through the generations please contact Raj on [raj.gill@kcl.ac.uk](mailto:raj.gill@kcl.ac.uk) or call 020 7188 6760.

### UK 10K



This study is now underway – thanks to all of you who gave your support to this new and exciting study that aims to identify rare genetic variants in health and common diseases. We hope that the results will enable further advances to be made in both the treatment and prevention of common diseases. We will keep you updated on progress over the next few years. For more details please see <http://www.uk10k.org/>

## YOUR DTR NEEDS YOU!



### Volunteer Advisory Panel

Some of you may be aware that in 2009 we established a twin **volunteer advisory panel (VAP)**, which for practical reasons is email-based. The VAP, comprising 12 individuals, meets twice a year and has made an invaluable contribution. It has...

- \* provided ideas for upcoming studies
- \* given feedback on current research
- \* piloted the online questionnaire
- \* designed the sequencing study information leaflet

Thank you to our current VAP for their valuable time and energy. We will be recruiting new members of the VAP in a year's time so keep checking your inbox if you are interested – this is your chance to be involved in the research behind the scenes and to really make a difference to the department.

## New Technology - if you have not already done so please register your email address today!

**Emails.** As many of you know, we prefer to communicate, where possible, by email. This allows us to quickly send you information on extra studies and events at little cost and allows our questionnaires to be completed online. If you do not, or prefer not to use email, don't worry, we will always try to communicate by post.

It is fine if only one of you wishes to register your email address. However, if you share your email address with other family members/your twin, we cannot accept liability for confidentiality so please, where possible use a unique email account.

**Email Guidelines Please save our email address - [twinsuk@kcl.ac.uk](mailto:twinsuk@kcl.ac.uk) in your address book or as a contact so that our emails to you don't end up as spam/junk! Please email [twinsuk@kcl.ac.uk](mailto:twinsuk@kcl.ac.uk) with your full name and date of birth ONLY IF..**

- a) you have not received an email from us in the last 3 months
- b) you would like to register your email address for the first time or you have recently changed your email address.

**On-line questionnaire.** In June we emailed our first online questionnaire as we embrace a new technological era and try to find ways to save money and the environment. We received a lot of positive feedback and comments on how efficient and simple it was. If you have not already done so please register to receive online questionnaires by emailing [twinsuk@kcl.ac.uk](mailto:twinsuk@kcl.ac.uk) with your full name and date of birth. If you do NOT have an email address, do not worry, we will continue to send postal questionnaires. If your email is already registered but you prefer to receive questionnaires by post, please email us to let us know.

## Dedicated twins plan sponsored walk for OUR DTR



66 year old identical twins Hazel and Christine, who have participated in our research for over 10 years, are raising funds for the DTR by doing a sponsored walk along the Greenwich Meridian Line starting on Sunday May 1st 2011. This involves walking approximately 273 miles in just 30 days from the Meridian Marker on the seashore at Peacehaven (East Sussex), through Kent, south and east London, Essex, Hertfordshire, Cambridgeshire, Lincolnshire, finishing at the coast near Tunstall, east of Hull (in Humberside). Along the way they will highlight the importance of twin research and how it benefits the whole population. **CAN YOU HELP IN ANY WAY?** Please contact Hazel and Christine at [randh@septlodge.plus.com](mailto:randh@septlodge.plus.com) if you can offer accommodation for one night, provide meals, or even join them for a small part of the route! **IF YOU WOULD LIKE TO SPONSOR THEM** you can either write a cheque payable to their charity account 'Meridian Line Walk' and post it to the attention of 'Department of Twin Research - Walk' (using the address on the bottom of page 1) OR you can sponsor them online **FROM JANUARY 2011** using the link to the Meridian Line Walk on the Chronic Disease Research Foundation (CDRF) Virgin Money Giving web page at <http://uk.virginmoneygiving.com/charities/cdrf> - If you sponsor online you can see the running total and also leave messages. **All donations (paid by cheque or through the charity web-site) will be allocated directly to the DTR via the CDRF, since the DTR cannot directly receive charitable donations.**



### FEARLESS TWO

Identical twins Frank and Ralph Land, pioneers in the early computer industry, marked their 82nd birthday on 24th

October by skydiving from 12,000 feet raising nearly £12,000 for Cancer Research UK. Regarding this first time experience, Frank commented "The experience was exciting and amazing, and I would not hesitate doing it again, though it passed so quickly, that there was no time to feel the exhilaration that some find in the experience." **Congratulations from the DTR on this extraordinary feat!**

**BEHIND THE SCENES AT THE DTR** If you have been to the DTR for a visit you may wonder what happens to the samples you provide. It is a pleasure to introduce our friendly laboratory team - Dylan, Kiran, Dimitri and Gabriela the lab manager, as they rarely get the chance to meet you. Every day your samples are brought over to the laboratory, separated into component parts, transferred into tubes and frozen for use at a later date. From the pink topped tubes, cheek swabs, saliva and hair we extract DNA, which we use, together with our collaborators, to investigate the genetic causes of diseases of ageing. To date we have processed over 300,000 samples! We are enormously proud of our "behind the scenes" crucial contribution to the research.

