Gene-environment interactions in obesity
02 April 2014
Cineworld: The O2, London, SE10 0DX, UK

It has become clear that there are large individual differences in the responsiveness to well-defined energy balance manipulations to control obesity. Overfeeding as well as negative energy balance protocols indicate that the response to standardized experimental treatments is strongly influenced by genetic background. However, testing gene-environment interaction is a relatively new field. This event will discuss identifying the genetic and environmental risk factors (lifestyle and diet) for obesity and the evidence for gene-environment interaction will be examined. This event will be an ideal setting to find out what is new in the field, to network and to meet the experts. This event is part of the 2014 Obesity Summit - www.obesitysummit2014.com and has CPD accreditation.

Meeting Chair: Dr Clare Llewellyn, Lecturer in Behavioural Obesity Research, University College London and King's College London, UK

Who Should Attend
Biotech and Pharma Industry: CEOs, Chief Scientists, Group Heads, Senior and Junior Scientists, Research Managers
Academic and Research Institutes: Group and Lab Heads, Postdoctoral Scientists and Research Students
Clinical specialists: Clinicians and dieticians specialising in obesity

The deadline for abstract submissions for oral presentation is Feb 10th 2014. Abstracts for poster presentation only can be submitted up to two weeks before the event. You can download the instructions for authors at: www.euroscicon.com/AbstractsForOralAndPosterPresentation.pdf

Talk times include 5 – 10 minutes for questions

9:00 – 9:45 Registration

9:45 – 10:00 Introduction by the Chair: Dr Clare Llewellyn, Lecturer in Behavioural Obesity Research, University College London and King's College London, UK

10:00 – 10:30 Gene-environment interactions in the triangular relationship between obesity, depression and cardiovascular disease
Dr Lucy F. Faulconbridge, Assistant Professor of Psychology in Psychiatry, University of Pennsylvania, USA
A triangular relationship exists between obesity, depression and cardiovascular disease (CVD). A bi-directional relationship exists between obesity and depression, and each disorder is independently associated with incident CVD. Not all obese individuals succumb to depression; nor does every depressed person develop obesity. Likewise there is wide variation in whether obese, or depressed, individuals, are vulnerable or resistant to CVD. This talk will review the genetic and environmental pathways connecting obesity, depression, and CVD, and address how this research informs clinical practice. We conclude by identifying areas for future research and highlight the challenges of measuring the gene-environment interactions within and between each disorder.

10:30 – 11:00 Talk title to be confirmed
Professor Gertjan Van Dijk, Center for Behavior and Neurosciences, University of Groningen, The Netherlands

11:00 – 11:30 Speakers’ photo then mid-morning break and poster exhibition and trade show
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Different expression of certain adipokines in subcutaneous and visceral tissues between obese and non-obese subjects and their correlations with clinical parameters and periphera metabolic factors.

Dr Chantacha Sitticharoon, Department of Physiology, Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand

NPY and Y5R mRNA expressions were higher in obese than in non-obese humans in both subcutaneous and visceral fat. In visceral fat, Y1R mRNA was greater while Y2R was lower in obese than in non-obese subjects. In visceral fat, Y1R mRNA was positively correlated with body weight, BMI, waist and hip circumferences, insulin, and HOMA-IR and Y5R mRNA was positively correlated with body weight, BMI, hip circumference, and serum leptin. Subcutaneous adiponectin mRNA was higher in non-obese group compared to obese group. Subcutaneous mRNA expressions of adiponectin, visfatin, and omentin were positively correlated with QUICKI but negatively correlated with BMI.

Oral Presentations

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Discussion session

This discussion session is an informal question and answer session. This is an ideal opportunity to get advice and opinion from experts in this area. This session is not for questions about specific talks, which can be asked after the speakers session, but for discussing either general topics or specific issues. There are three ways you can ask questions:

1. Before the session you can submit your question to Euroscicon staff at the registration desk,
2. Before and during the session you can submit a question or comments, by email, which will be provided on the day of the event
3. During the session you can put your hand up and join in

Nutrition is widely believed to influence the ageing course with micronutrients playing a central role in metabolism and the maintenance of tissue function. Micronutrient nutrition has an enhancing effect on DNA repair in humans and has a profound influence on gene expression. Epidemiological evidence suggests an association between low consumption of fruit and vegetables and cancer with investigations supporting a role for the Mediterranean diet in having an ameliorating or preventative effect on cardiovascular risk. We have investigated some of these relationships in 'elite' nonagenarians from the BELFAST study who have aged well and avoided premature death from cardiovascular or cancer-related disease.
16:00 – 16:30  **Genetic and Environmental Determinants of Comorbid Obesity in Major Psychiatric Disorders**  
*Dr Margarita Rivera,* Lecturer in Psychiatric Genetics, Institute of Psychiatry, King's College London, UK  
People with major psychiatric disorders (major depressive disorder, bipolar disorder, schizophrenia), particularly with mood disorders, have higher prevalence of comorbid obesity-related diseases, such as type 2 diabetes, metabolic syndrome and cardiovascular disease. The relationship between mental and physical disorders is complex and not clearly understood. Although it is well reported that these related diseases have a high impact in the lifespan and mortality of people with psychiatric disorders. Recent studies support the hypothesis that there may be shared aetiological factors, including genetic and environmental risk factors, between psychiatric disorders and obesity-related diseases. The talk will highlight the evidence of genetic and environmental risk factors implicated in the comorbidity of obesity-related diseases in major psychiatric disorders.

16:30 - 17:00  **Obesity, leptin and respiratory control**  
*Dr Mirian Bassi,* Post-Doctoral, School of Dentistry, São Paulo State University (UNESP), Araraquara, Sao Paulo-Brazil  
Evidence suggests that, in addition to regulate energy homeostasis and sympathetic activity, leptin also contributes to the CNS control of breathing. Obese transgenic leptin deficient (ob/ob) mice have an impaired respiratory response to hypercapnia that can be reverted by leptin treatment. Although the cellular basis for leptin effects on respiratory control is unknown, data from our studies have shown that melanocortin 3/4 receptors (MC3/4R), a system that play a pivotal role in mediated metabolic and cardiovascular actions of leptin. also can mediated leptin effects on ventilation. In addition, we demonstrated that leptin may act in an important nucleus located in the ventral chemoreceptive surface of medulla called retrotrapezoid (RTN) to induces these respiratory alterations.

17:00  **Chairman’s Summing Up and Close of Meeting**

**Keywords:** Obesity, genetics, proteomics, biomarker, cell defence, blood, gene expression, biomarkers, homeostasis, environment, NPY, NPY receptors, adiponectin, omentin, visfatin, psychiatric disorders, depression, BMI, obesity, FTO gene, Obesity; genes; environment; gene-environment interaction; obesogenic, Obesity, breathing control, leptin, chemoreception, melanocortin receptors, Nutrition, Epigenetics, Cytokine, longevity, Octo/nonagenarians, obesity, depression, cardiovascular disease, vulnerability,

**Registration Website:** [www.regonline.co.uk/geneobesity2014](http://www.regonline.co.uk/geneobesity2014)

**About the Chair**  
*Clare Llewellyn* had an initial career working on the commercial side of the pharmaceutical industry, before she retrained as a psychologist, completing an MSc in Health Psychology, then a PhD focusing on genetic influences on appetite and growth, both at University College London (UCL). She is currently a Lecturer in Behavioural Obesity Research at the Health Behavioural Research Centre, UCL. The main focus of her work is to understand why some individuals gain weight, but others remain effortlessly lean, in response to the current ‘obesogenic’ environment. Given that body weight is highly heritable, researchers have been tasked with marrying up the seeming paradox of both genetic and environmental determination of weight. The hypothesis that Clare has been developing is that ‘obesity genes’ influence weight through their effects on appetite, thereby providing a platform for gene-environment interaction — individuals who inherit a more avid appetite are susceptible to overeating in an environment with an abundant food supply, and at risk of excessive weight gain.
**About the Speakers**

Lucy F. Faulconbridge, Ph.D. is an Assistant Professor of Psychology and Director of Research in the Center for Weight and Eating Disorders at the University of Pennsylvania’s Perelman School of Medicine in Philadelphia, PA. She received her B.A. from the University of St Andrews in Scotland and received her PhD in Clinical Psychology from the University of Pennsylvania. Her research interests focus on the co-morbidity of obesity with mental illness, particularly depression, as well as the relationship between weight change and risk factors for cardiovascular disease. Her research is currently funded by a K23 award from the National Heart, Lung and Blood Institute.

Chantacha Sitticharoon graduated from Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand in 2001 with honours. She completed her PhD degree in Physiology from Faculty of Medicine, Nursing and Health Sciences, Monash University Australia in 2009. Her PhD thesis was about expressions of appetite regulating peptides in sheep hypothalamus in various conditions. Now, She has been working as an instructor at Department of Physiology, Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand since 2001. Her research interests include obesity, appetite regulation, and regulation of reproduction, especially factors involved in early onset of puberty.

I Maeve Rea, Senior Lecturer/Consultant Physician in Geriatric Medicine at Queens University Belfast, was educated at Queens University and did postgraduate research in immune-genetics at Stanford University with Prof Rose Payne. She teaches widely in the Undergraduate Medical curriculum and within her Health Service remit, she provides a clinical service to Elderly people, with a special interest in patients over 90 years of age. Dr I Maeve Rea has a long-time research interest is in healthy ageing and set up and co-ordinates a longitudinal study of octo/nonagenarians, Belfast Elderly Longitudinal Free-living Ageing Study (BELFAST) and is a Principal Investigator in the Genetics of Healthy Ageing Study (GeHA), which is contributing to understanding the genetic, immunological, cardiovascular and nutritional factors contributing to good quality ageing.

Margarita Rivera is a BRC Senior Postdoctoral Researcher at the MRC Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry. Her work focuses on investigating the genetic relationship between major psychiatric disorders, mainly depression and bipolar disorder, and obesity-related diseases (i.e. type 2 diabetes, metabolic syndrome, cardiovascular disorders, etc). The goal of her research is to get a better understanding of the molecular genetic basis of comorbidity between psychiatric disorders and obesity-related diseases, both of which have major public health, clinical, economic, personal and social implications worldwide.

Mirian Bassi: Physiotherapist, Specialist in Pulmonary Rehabilitation (2002); Master degree (2004) and Ph.D. (2008) in Physiological Sciences at Medical School of São Paulo University, Ribeirão Preto- Brazil; Post-doctoral training in cardiovascular physiology at Guyton Research Center, University ofMississippi Medical Center, USA (2009) in collaboration with Dr. John E. Hall; Visiting Research at Department of Physiology and Neurobiology, University of Connecticut, USA (2012) in collaboration with Dr. Daniel Mulkey, studying the central role of leptin on neuronal activity of respiratory neurons (electrophysiology). Currently is is post-doc fellow at the Department of Physiology and Pathology, School of Dentistry - São Paulo State University, Brazil studying participation of leptin on cardiorespiratory control mechanisms.

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