PhD studentships

Funded by the

NIHR Maudsley Biomedical Research Centre

Project Catalogue

Obesity, Lifestyle and Learning from Extreme Populations

Studentships to commence October 2018

Contents

Introduction

Welcome to the National Institute for Health Research (NIHR) Maudsley Biomedical Research Centre (BRC) project catalogue for potential candidates wishing to commence a PhD in October 2018 – we hope you will find a project which interests you.

The Maudsley BRC is a collaboration between the Institute of Psychiatry, Psychology and Neuroscience (IoPPN), King's College London – the largest collection of researchers in Europe investigating mental disorders, and the South London and Maudsley NHS Foundation Trust – a leading mental health trust with a long tradition in joining clinical and academic excellence. Most Maudsley BRC researchers, staff and students are based at the IoPPN at the King's College London Denmark Hill campus which is adjacent to the Maudsley Hospital. Within this setting we offer the opportunity to join a thriving group of interdisciplinary researchers with internationally recognised supervisors and we ensure our students benefit from an understanding of the context of their research, producing scientists with a strong translational ethos.

The Maudsley BRC is dedicated to developing better treatments for people with mental and neurological disorders, which collectively cause most of the disease burden in Western societies. Within the BRC we offer projects which are clinically relevant and attempt to bring new innovation to help treat people with mental disorders, dementia and other neurological conditions. This is the most exciting field in biomedical science, the least researched, the most important. And we offer an opportunity to gain research training in a vibrant and exciting centre where doctoral students are highly valued members of our team.

We hope we can look forward to receiving your application.

Professor Matthew Hotopf
Director
Maudsley Biomedical Research Centre

Professor Richard Brown
Training Lead
Maudsley Biomedical Research Centre

NIHR Maudsley Biomedical Research Centre (BRC)

NIHR Biomedical Research Centres are funded to support people and/or patient-focused early translational (experimental medicine) research, the aim of which is to translate discoveries from basic/discovery science into clinical research, and through to benefits for patients, the health system and for broader economic gain.

On September 16 2016 the Secretary of State for Health announced that the Department of Health has awarded £66 million funding over the next five years to the National Institute for Health Research (NIHR) Biomedical Research Centre (BRC) at South London and Maudsley NHS Foundation Trust and the Institute of Psychiatry, Psychology & Neuroscience at King's College London.

The award represents a substantial uplift in funding compared to the previous BRC funding round, and demonstrates the government's continued commitment to the current NIHR Maudsley BRC, allowing the research centre both to build on its current work and expand into new areas including substance use, obesity, pain and mobile health technology.

The expanded NIHR Maudsley BRC will bring together scientists, clinicians, mental health professionals, service users and carers, to improve clinical care and services across the field of mental health. The investment in the NIHR Maudsley BRC will allow research into ground-breaking treatments and care for mental health and dementia.

NIHR Maudsley BRC Strategy

There are four major elements to the NIHR Maudsley BRC strategy for the coming 5 years, reflected in aims of the 17 themes:

- **Precision psychiatry**: Bringing together insights from cognition, behaviour, genomics and brain imaging, we will develop biologically-informed strata of psychiatric syndromes, with the ambition to develop and provide more individually tailored treatment
- **Novel therapeutics**: Using the access to our large databases, electronic consent for contact procedures, and our dedicated experimental medicine Clinical Research Facility (CRF), we will undertake trials of new pharmacological, neuromodulation and psychological treatments
- **Translational informatics**: By using our bespoke natural language processing algorithms and 'smart agents', we will use informatics to influence treatment choice, increase adherence, improve health behaviours and increase patient empowerment, all of which will benefit patient outcomes and service delivery
- **Mental/physical interface**: We will decrease the 15 years of life lost to serious mental illness by using informatics to identify, prioritise and track the treatment of those with comorbid mental and physical disorders

Clinical disorder focused research themes

Seven clinical disorder focused research themes cover mental health and dementia from cradle to grave:

- Affective Disorders and Interface with Medicine
- Child and Neurodevelopmental Disorders
- Dementia and Related Disorders
- Lifestyle Substance Use & Harms (Substance Use)
- Obesity, Lifestyle and Learning from Extreme Populations (Obesity)
- Pain and headache
- Psychosis and Neuropsychiatry

Technology and methodology focused research themes

Seven technology and methodology focused research themes develop and deploy new approaches to clinical problems:

- Bioinformatics and Statistics
- Biomarkers and Genomics
- Clinical and Population Informatics
- Mobile Health
- Neuroimaging
- Patient and Carer Involvement and Engagement
- Translational Therapeutics

Cross cutting themes

Three cross cutting themes provide enabling infrastructure:

- BioResource
- Clinical Research Facility
- Training and Capacity Development

Obesity, Lifestyle and Learning from Extreme Populations (Obesity)

Lead: Professor Ulrike Schmidt

This theme focuses on behavioural research into obesity, and improving metabolic outcomes for people with mental disorders. It translates findings from neuroscience and mental health into treatments for obesity in the general population. It uses longitudinal cohorts established in early life and extreme weight phenotypes to determine neurobiological, psychological and behavioural underpinnings of disordered eating behaviour, weight gain and obesity, and to identify biomarkers.

Aims

1. Develop predictive models of obesity precursors and correlates (disordered eating behaviour, metabolic syndrome, weight gain) in different cohorts, facilitating stratified early risk detection and prognosis for obesity
2. Apply learning from extreme phenotypes in mental health to obesity in the general population by identifying biomarkers of treatment response (weight gain/loss) in bariatric surgery, anorexia nervosa and psychosis
3. Extend our expertise in complex interventions for mental health to obesity in the general population by evaluating novel therapeutics and translating into scalable interventions

Institute of Psychiatry, Psychology and Neuroscience

The Institute is organised into three academic divisions, each comprised of a number of cognate departments. Each Division includes academics and researchers from diverse scientific disciplines, working closely with colleagues across the faculty and our national and international partners:

- **Division of Academic Psychiatry** comprises 6 departments: Addictions Sciences; Forensic & Neurodevelopmental Science; Child & Adolescent Psychiatry; Old Age Psychiatry; Psychological Medicine and Psychosis Studies (https://www.kcl.ac.uk/ioppn/divisions/academic-psychiatry/index.aspx)
- **Division of Psychology & Systems Science** comprises 4 departments: Biostatistics & Health Informatics; Health Service & Populations Research; Social Genetic & Developmental Psychiatry; Psychology; (https://www.kcl.ac.uk/ioppn/divisions/psychology/index.aspx)
- **Division of Neuroscience** comprises 4 departments: Basic & Clinical Neuroscience; Neuroimaging; Developmental Neurobiology; Wolfson Centre for Age-related Diseases (https://www.kcl.ac.uk/ioppn/divisions/neuroscience/index.aspx)

Successful applicants for these studentships will be registered for their MPhil/PhD with King's College London and will be based in the same department as their first supervisor. For most of the projects in this catalogue, the first supervisor is based in a department at the Institute of Psychiatry, Psychology and Neuroscience (IoPPN).

Please note: The final choice of project and project details are agreed after successful interview.

Projects

When applying for the NIHR Maudsley Biomedical Research Centre PhD studentship in the **Obesity, Lefestyle and Learning from Extreme Populations** theme, please ensure you state your two preferred PhD projects from those listed in this catalogue only**. These should be listed in order of preference and include the number that is assigned to the project and the project title.

For example:

1. OLEP-2.04 Investigating, applying and promoting physical activity in eating disorders and obesity
2. OLEP-2.01 The use of translational science to improve the understanding and treatment of binge eating: an experimental investigation of interpersonal functioning in high risk individuals and patients with short or longer illness duration.

****Important:** With your application, in addition to the personal statement, please upload a separate single-side A4 document listing your first and second choice projects with a statement explaining why you have chosen your **first choice** project and why you would like to take this forward as a PhD (**maximum 300 words**).

****If you wish to apply for one or more of the other studentships we are currently advertising, please upload a *separate A4 sheet for each studentship* you are applying for, stating your preferred project choices from those advertised with the studentship, and a statement about your first choice project (see above). Please ensure each sheet clearly indicates which studentship you are applying for and lists only projects advertised for that particular studentship.

If you wish to discuss a project before you apply, you will find supervisors' names and their contact details listed with each project in this catalogue.

Further information about project supervisors can be viewed in the King's College London Research Portal. Under **Researchers**, type the name of the person you wish to view information about.

Please note: The final choice of project and project details are agreed after successful interview.

OLEP-2.01 The use of translational science to improve the understanding and treatment of binge eating: an experimental investigation of interpersonal functioning in high risk individuals and patients with short or longer illness duration.

Primary Supervisor: Dr Valentina Cardi

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Second Supervisor: Dr Valeria Mondelli

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Project Description

Background: Social difficulties are implicated in the onset and maintenance of eating disorders, such as anorexia nervosa and bulimia nervosa. The extent to which these difficulties are also implicated in the maintenance of disorders characterized by loss of control over eating is largely unknown.

Novelty and Importance: This study will employ an experimental medicine approach to investigate social functioning in people experiencing episodes of loss of control over eating at various stages (i.e. high risk, short or long duration of illness). It will be the first study assessing the quality and complexity of social networks and the cognitive processing of social stimuli depicting the risk of social rejection in the targeted population. The findings from this study will be used to plan and develop a larger randomized-controlled trial testing a novel online and self-directed training to address biased cognitive processing of social stimuli and isolation in patients with eating and weight disorders.

Primary aim(s): The primary goals of this study are: i) to assess early interpersonal adversity, complexity and quality of social networks and cognitive processing of social stimuli in individuals at high risk for the development of binge eating disorder and patients with binge eating disorder at an early or later stage of the illness, ii) to examine the relationship between social difficulties and abnormal eating behaviors and attitudes in the targeted population, and iii) to develop a computerized training to remediate social difficulties in people experiencing loss of control over eating.

Planned research methods and training provided: A cross-sectional study will be conducted. Training in the development and implementation of reaction-time based computerized tasks using computer programs such as Inquisit and E-prime will be provided. Training in the clinical assessment of patients with eating disorders using structured clinical interviews will be given. The study will entail training in using advanced statistical analyses to analyse the quantitative data, such as linear mixed models. Finally, training will be provided in conducting novel online assessments to collect data on social networks.

OLEP-2.01 The use of translational science to improve the understanding and treatment of binge eating: an experimental investigation of interpersonal functioning in high risk individuals and patients with short or longer illness duration.

Objectives / project plan:

Year 1: The objectives for the first year are: i) to conduct a systematic review and meta-analysis on social difficulties, interpersonal sensitivity and threat processing in obese people, ii) to develop and validate experimental tasks and materials, iii) to obtain ethics approval.

Year 2: The main objective for the second year is the recruitment of participants and data collection.

Year 3: The main objectives for the third year are data analyses and dissemination of findings through peer-reviewed publications and conference presentations.

Two representative publications from supervisors:

1: Cardi V, Esposito M, Bird G, Rhind C, Yiend J, Schifano S, Hirsch C, Treasure J. (2015). A preliminary investigation of a novel training to target cognitive biases towards negative social stimuli in Anorexia Nervosa. Journal of Affective Disorders, 1;188:188-93. DOI: 10.1016/j.jad.2015.08.019.

2: Cardi, V., Turton, R., Schifano, S., Leppanen, J., Hirsch, C., Treasure, J. (2017). Biased interpretation of ambiguous social scenarios in anorexia nervosa. European Eating Disorders Review, 25(1):60-64. DOI: 10.1002/erv.2493

Keywords: Binge eating disorders; Obesity; Social; Cognitive bias; Computerised training;

BRC Theme/s:

Obesity, Lifestyle and Learning from Extreme Populations
Mobile Health
Patient and Carer Involvement and Engagement
Translational Therapeutics
BioResource

OLEP-2.02 Identification of neurobehavioural predictors of eating disorders, weight gain and obesity

Primary Supervisor: Dr Sylvane Desrivieres

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Second Supervisor: Professor Ulrike Schmidt

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Project Description

Background: The eating disorders [anorexia nervosa (AN), bulimia nervosa (BN), binge eating disorder (BED) and related sub-clinical syndromes] are common psychiatric disorders which affect up to 15% of young women and up to 4% of young men in high income countries. The peak age of onset of EDs is from mid adolescence into emerging adulthood (age 15 to 19), i.e. at a developmentally sensitive time. Moreover, one in 2-3 people with BN or BED are obese or will become obese, making them vulnerable to obesity-related complications.
While the aetiology of EDs is complex, there is a broad acceptance of EDs as being brain-based disorders and increasing evidence suggesting neurobiological overlaps between ED, anxiety disorders and addictions. Yet, most ED studies are based on small cross-sectional investigations of individuals who are either currently ill or have recovered from an ED, and thus any abnormalities displayed may reflect symptom severity, illness duration or 'scarring' effects. There have been no prospective studies for the neural risk factors of EDs, which precludes the establishment of a causal relationship between any associated factor and the development of disordered eating/EDs.

Novelty and Importance: There have been no prospective studies for the neural risk factors of EDs, which precludes the establishment of a causal relationship between any associated factor and the development of disordered eating/EDs. In this project, we propose to overcome these limitations using data from the IMAGEN project, a large population-based longitudinal cohort of adolescents, and a newly recruited clinical sample of emerging adults with an ED (AN or BED) diagnosis with complementary assessments.

Primary aim(s): The aims of this project are to elucidate the neurobiological basis of EDs and identify predictor of EDs, weight gain and obesity in young adulthood.

Objectives / project plan:

Year 1: The student will *(i)* familiarise themselves with the neurobiological basis of EDs and obesity and the IMAGEN project and database; *(ii)* conduct a relevant systematic review (e.g. on neurobiological predictors of EDs/obesity); *(iii)* utilise IMAGEN behavioural and BMI data (age 14 to 21) to identify and characterise different clusters of participants with distinct trajectories of disordered eating and body mass index (BMI) change.

Year 2: Using age 14 IMAGEN data, he/she will identify environmental, biological and psychological factors that characterize the different clusters previously derived.

OLEP-2.02 Identification of neurobehavioural predictors of eating disorders, weight gain and obesity

Year 3: He/she will *(i)* study interactions between these factors to derive bio-behavioural risk/prediction models of EDs, weight gain and obesity and *(ii)* validate the results in a clinical sample of emerging adults with an ED (AN or BED) diagnosis.

Two representative publications from supervisors:

1: Bartholdy S, Dalton B, O'Daly OG, Campbell IC, Schmidt U. A systematic review of the relationship between eating, weight and inhibitory control using the stop signal task. Neurosci Biobehav Rev. 2016 May;64:35-62.

2: Xu B, Jia T, Macare C, Banaschewski T, Bokde ALW, Bromberg U, Büchel C, Cattrell A, Conrod PJ, Flor H, Frouin V, Gallinat J, Garavan H, Gowland P, Heinz A, Ittermann B, Martinot JL, Paillère Martinot ML, Nees F, Orfanos DP, Paus T, Poustka L, Smolka MN, Walter H, Whelan R, Schumann G, Desrivières S; IMAGEN Consortium. Impact of a Common Genetic Variation Associated with Putamen Volume on Neural Mechanisms of Attention-Deficit/Hyperactivity Disorder. J Am Acad Child Adolesc Psychiatry. 2017 May;56(5):436-444

Keywords: ;Eating disorders; Obesity; Body Mass Index; BMI: IMAGEN; Biomarker;

BRC Theme/s:
Obesity, Lifestyle and Learning from Extreme Populations
Bioinformatics and Statistics
Biomarkers and Genomics
Neuroimaging

OLEP-2.03 Can high-intensity-training (HIT) improve symptoms, physical health and recovery among inpatients with severe mental illness?

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Project Description

Background: People with severe mental illness (SMI) experience a premature mortality gap of up to 20 years, largely due to cardiovascular disease. High intensity interval training (HIT) is a time efficient exercise that has demonstrated good efficacy in improving cardiometabolic risk and decreasing inflammation in physical health disorders (e.g, diabetes) but no evidence is available in people with SMI.

Novelty and Importance: This is the first trial of HIT in people with SMI and has the potential to address key issues including the increased obesity/cardiometabolic risk and thus help tackle the poor physical health which contributes to premature mortality in this population.

Primary aim(s):

1) Investigate the feasibility and acceptability study of computer monitored cycle interval training intervention among inpatients with severe mental illness over 12 weeks.

2) Investigate the impact of the HIT intervention on potential outcome measures for a definitive multicentre RCT, including mental health symptoms, cognition, psychiatric symptoms, cardiometabolic risk factors, inflammatory markers and length of hospital stay.

Planned research methods and training provided: The PhD project will consist of two phases: 1) Development and piloting of the HIT intervention. 2) Feasibility study of RCT of HIT training over 12 weeks, including collection of proposed outcome measures data, acceptability of randomisation, blinding to intervention status, qualitative interviews with study participants.

Continued on next page

OLEP-2.03 Can high-intensity-training (HIT) improve symptoms, physical health and recovery among inpatients with severe mental illness?

Specifically, following the appropriate NHS ethical and governance permissions, we will conduct a pre and post-test HIT aerobic exercise intervention using a static bike across six hospital wards in the South London and Maudsley (SLaM) NHS foundation trust to develop the intervention and demonstrate feasibility and acceptability. The candidate will recruit 30-40 inpatients with SMI, including those with schizophrenia spectrum or affective disorders aged between 18 and 50 years old who have the capacity to provide informed consent.

Primary outcome: Assess the acceptability, feasibility and safety of the HIT intervention among inpatients.

Secondary outcomes: We will collect information on the following outcomes at baseline and after 12 weeks from participants. Cardiometabolic risk factors/ inflammatory markers (e.g. BMI, c-reactive protein and Interleukin 6), Cardiorespiratory fitness, Cognition, Psychiatric symptoms and functioning, smoking and appetite cravings,

Objectives / project plan:

Year 1:
Acquire all governance approvals and undertake a systematic review considering HIT training and efficacy on physical and mental health outcomes in all populations. Develop, refine and test the HIT training program in conjunction with supervisors and industry partner (Prof Jamie Timmons).

Year 2:
Recruit and undertake the feasibility RCT in 30-40 people with SMI over 12 weeks.

Year 3:
Undertake qualitative interviews with participants to explore feasibility and acceptability.

Two representative publications from supervisors:

1: Vancampfort D, Firth J, Schuch FB, Rosenbaum S, Mugisha J, Hallgren M, Probst M, Ward PB, **Gaughran F**, De Hert M, Carvalho AF, **Stubbs B**. (2017) Sedentary behavior and physical activity levels in people with schizophrenia, bipolar disorder and major depressive disorder: a global systematic review and meta-analysis. World Psychiatry. 2017 Oct;16(3):308-315

2: Firth J, **Stubbs B** et al (2017) Aerobic Exercise Improves Cognitive Functioning in People With Schizophrenia: A Systematic Review and Meta-Analysis. Schizophrenia Bulletin. 2017 May 1;43(3):546-556

Keywords: Exercise; Psychosis; Obesity; Inflammation; High intensity interval training;

BRC Theme/s:
Obesity, Lifestyle and Learning from Extreme Populations
Biomarkers and Genomics
Translational Therapeutics
Clinical Research Facility

OLEP-2.04 Investigating, applying and promoting physical activity in eating disorders and obesity

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Third Co-supervisor: Matija Dunaj, Professor of Kinesiology

Organisation: Fitnes učilište, Zagreb, Croatia

Project Description

Background: Research has shown that an appropriate amount of physical activity (PA) is beneficial for people with mental and physical health issues. For example, cytokine over-production in patients with obesity can be favorably influenced by PA (see publication 1). Vice versa, a lack of PA might lead to physical and mental health problems such as obesity and depression (publication 2).

However, in eating disorders (EDs) the relation between PA and health is less clear, because an excess of PA may be a symptom or an exacerbating factor of EDs.

In recent years, the concept of health-enhancing physical activity (HEPA) has opened new ways in applying PA in a therapeutically meaningful way. This project will analyze already available data on PA in EDs and obesity derived from previous own studies, it will review the use of HEPA in EDs and help to develop and implement educational material for the European fitness industry. Our fitness industry partner, Fitnes učilište, has experience from a previous common project http://bsoe.eu/ in the field of HEPA, EDs and fitness industry.

Novelty and Importance: This PhD project will provide novel insights into the impact of PA on psychopathology and physical health. A systematic review of the therapeutic use of HEPA in EDs and obesity will yield comprehensive knowledge about the potential, the benefits and the risks of the application of HEPA in this patient group.
This project will help to create educational material for fitness trainers to support patients with EDs and obesity and to implement its use in the fitness industry.

Primary aim(s):

- Evaluating data on PA in EDs and obesity.
- Reviewing the literature about the use of HEPA in EDs and obesity.
- Helping to create educational material for fitness trainers and to implement its use.
- Performing a pilot study on the effects of HEPA in patients with EDs and obesity.

OLEP-2.04 Investigating, applying and promoting physical activity in eating disorders and obesity

Planned research methods and training provided:

- Statistics of meta-analyses
- PPI involvement
- Designing clinical trials

Objectives / project plan:

Year 1:

- Evaluation of data related to PA in patients with EDs and obesity derived from the following studies:
  - Obesity and depression: pathogenetic role of sleep and wakefulness regulation, motoric activity level and neurochemical aspects (OBDEP)
  - Relationship between Overactivity, Stress and Anxiety in Anorexia Nervosa (ROSANA)
  - Cytokines and their relation to clinical characteristics in individuals with a diagnosis of Anorexia Nervosa (CyAN)
- Meta-analyses: HEPA in patients with EDs and obesity; genetic correlation of PA and EDs

Year 2:

- Publication of the findings in year 1.
- Developing educational material for fitness trainers to support patients with different EDs.
- Designing a pilot study about the use of HEPA in patients with EDs and obesity in a fitness studio setting using the developed material; study design according to findings in previous studies and literature review.

Year 3:

- Implementation of educational material.
- Performing the pilot study: HEPA in patients with EDs and obesity. Eligible patients will be invited for standardized phenotyping and blood sampling for biobanking at the BioResource.

Two representative publications from supervisors:

1: Schmidt FM, Weschenfelder J, Sander C, Minkwitz J, Thormann J, Chittka T, Mergl R, Kirkby KC, Faßhauer M, Stumvoll M, Holdt LM, Teupser D, Hegerl U, **Himmerich H**: Inflammatory cytokines in general and central obesity and modulating effects of physical activity. PLoS One 2015;10:e0121971.

2: Sander C, Ueck P, Mergl R, Gordon G, Hegerl U, **Himmerich H**: Physical activity in depressed and non-depressed patients with obesity. Eat Weight Disord 2017, Epub.

Keywords: Eating disorders; Anorexia nervosa; Obesity; Fitness industry; Health Enhancing Physical Activity; HEPA;

BRC Theme/s:

Obesity, Lifestyle and Learning from Extreme Populations
Biomarkers and Genomics
Patient and Carer Involvement and Engagement
Translational Therapeutics
BioResource

OLEP-2.05 Defining the eating disorder phenotypes in type 1 diabetes to improve clinical screening and to support the development of targeted interventions.

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Project Description

Background: People with type 1 diabetes (T1DM) have double the risk of having an eating disorder (ED) than people without T1DM. A dangerous feature of ED, only observed in patients with T1DM, involves deliberately restricting insulin with the intention of losing weight. This leads to long-term health problems associated with frequently high blood glucose levels, to recurrent episodes of diabetes ketoacidosis and tripled mortality rates.

There is currently no consensus on the definition of ED in T1DM and no coherent screening strategy for identifying people who have ED or are at risk within the T1DM population, which would be urgently needed to develop targeted interventions.

Novelty and Importance: The 'Defining eating disorder in type 1 diabetes' project links into the 'Safe management of people with Type 1 diabetes and EAting Disorders studY' (STEADY) which is an NIHR funded fellowship study aiming to develop an intervention for T1DM with ED.

Phenotyping will be developed from qualitative and observational studies that link psychological models with pathophysiological observations and will be testing hypotheses derived from the updated transdiagnostic eating disorders models.

Primary aim(s): The aim of this project is to examine and describe the different phenotypes of eating disorders in T1DM and better understand the role of fluxes in blood glucose in triggering disturbed eating behaviours, insulin omission behaviours and food addiction.

Planned research methods and training provided: Training in the clinical assessment of eating and weight disorders and anxiety and depression comorbidity using structured clinical interviews will be given. The study will also entail training in using advanced statistical analyses, such as linear mixed models. The candidate will be trained in the use of glucose sensor and app technology for diabetes research.

OLEP-2.05 Defining the eating disorder phenotypes in type 1 diabetes to improve clinical screening and to support the development of targeted interventions.

Objectives / project plan: This project will be timed alongside the main project as an additional piece of research.

Year 1:

a) Semi-structured interviews with patients and health care professionals will provide the qualitative data to help phenotype and classify the different clinical constructs of ED in T1DM

b) An observational study of blood glucose variability and eating behaviour in people with T1DM and ED

Year 2:

c) Construct validity of existing screening questionnaires for ED in T1DM and

d) developing a new clinical screening tool that matches the phenotypes

Year 3:

e) estimating the prevalence of ED in T1DM by screening the T1DM population of South London.

f) dissemination of findings through peer reviewed research publications and conference presentations.

Two representative publications from supervisors:

1: Eating disorders in people with Type 1 diabetes: experiential perspectives of both clients and healthcare professionals. Macdonald, P., Kan, C., Stadler, M., De Bernier, G. L., Hadjimichalis, A., Le Coguic, A. S., Allan, J., Ismail, K. & Treasure, J. 16 Dec 2017 In : Diabetic Medicine.

2: Systematic review and meta-analysis of the efficacy of interventions for people with Type 1 diabetes mellitus and disordered eating. Clery, P., Stahl, D., Ismail, K., Treasure, J. & Kan, C. Dec 2017 In : Diabetic medicine : a journal of the British Diabetic Association. 34, 12, p. 1667–1675

Keywords: Diabulimia; Eating disorder; Type 1 diabetes; Insulin omission behaviour; Food addiction;

BRC Theme/s:
Obesity, Lifestyle and Learning from Extreme Populations
Mobile Health
Patient and Carer Involvement and Engagement
Translational Therapeutics

OLEP-2.06 A longitudinal study to identify psychological and psychopathological predictors of mental health outcomes from bariatric surgery

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Project Description

Background: Very few studies have focused on long-term (1 year post-surgery) clinical outcome of bariatric surgery and most of these studies have focused mainly on physical clinical outcome, leaving the area of long-term mental health outcome largely understudied. Although an initial improvement in mental health has been documented over the first year after surgery, an increase in binge eating episodes, emotional eating, loss of control over eating and night eating has been documented between the first and third post-operative years.

Novelty and Importance: This study will investigate the demographic and psychological characteristics of those who might benefit the most from bariatric surgery. The findings will also indicate which psychopathological traits predict worst outcomes and will be used to plan for the development of personalized, computer-based trainings to improve outcomes from this treatment.

Primary aim(s): The primary goal of this study will be to identify the difference in rate of mental health issues at 1 and 3 years post-surgery by conducting an in-depth assessment of psychiatric symptoms, psychological functioning, social adjustment and eating behavior at 1-3 years post-surgery. This assessment will include the use of standardized questionnaires, as well as qualitative methods. The second aim of the study is to identify psychosocial risk factors for long-term (1-3 years) mental health clinical outcome following bariatric surgery, by leveraging on data collected over the past 5 years at King's College Hospital as part of pre-surgical assessment.

Planned research methods and training provided: A mixed-method investigation consisting on the use of quantitative and qualitative methods will be used. There will be a possibility to conduct in-depth clinical assessments and structured interviews with the study's participants. Supervision and training in conducting systematic reviews of the literature, practicing public speaking and writing up scientific papers will be provided.

Continued on next page

OLEP-2.06 A longitudinal study to identify psychological and psychopathological predictors of mental health outcomes from bariatric surgery

Objectives / project plan:

Year 1: The objectives for the first year are: i) to conduct a systematic review and meta-analysis of the short- and long-term predictors of bariatric surgery outcomes, ii) to obtain ethics approval, iii) to enter data from questionnaires previously collected as part of pre-surgical assessment.

Year 2: The main objective for the second year is to conduct follow-up assessments of people who have undergone bariatric surgery procedures at King's College Hospital.

Year 3: The main objectives of for the third year are data analyses and dissemination of findings through peer-reviewed publications and conference presentations.

Two representative publications from supervisors:

1: N. Hepgul, C.M. Pariante, S. Di Pasquale, M. Di Forti, H. Taylor, T.R. Marques, C. Morgan, P.Dazzan, R.M. Murray, **V. Mondelli**. Childhood maltreatment is associated with increased body mass index and increased C reactive protein levels in first-episode psychosis. Psychological Medicine. 2012; 42(9):1893-901

2: Turton, R., Bruidegom, K., **Cardi, V.,** Hirsch, C. R. & Treasure, J. Novel methods to help develop healthier eating habits for eating and weight disorders: A systematic review and meta-analysis. Neurosci Biobehav Rev 2016; 61,132-155.

Keywords: Binge eating disorder; Obesity; Bariatric surgery; Predictors; Outcomes;

BRC Theme/s:
Obesity, Lifestyle and Learning from Extreme Populations
Patient and Carer Involvement and Engagement
Translational Therapeutics

OLEP-2.07 To develop and assess the feasibility of a behaviour change weight loss intervention for people with obesity and psoriasis, implemented within a multi-disciplinary service.

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Project Description

Background: Psoriasis is a chronic inflammatory skin disease which has a significant impact on health-related quality of life (HRQOL). One third of the UK's severe psoriasis population are obese (much higher than the population rate of obesity). The reasons for this association remain unclear, but have crucial impactions for the disease. Elevated BMI directly impedes successful pharmacological and phototherapy responses to treatment. Those who are obese are 50% less likely to respond to biologics. Extensive research has also shown that obesity is a risk factors for mood disorders (and vice versa), with obesity and depression prevalent co-occurring conditions. There is a need to reduce obesity in people with psoriasis to improve treatment outcomes and possibly mood. Surgical interventions for obesity exist but are costly and incur high risks. Non-surgical behaviour change interventions for obesity do exist but have not been developed specifically for the needs of this population.

Primary aim(s): To develop and test the feasibility of a theory based cognitive-behavioural intervention to reduce obesity and improve treatment outcomes for people with psoriasis.

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OLEP-2.07 To develop and assess the feasibility of a behaviour change weight loss intervention for people with obesity and psoriasis, implemented within a multi-disciplinary service.

Objectives / project plan: The PhD is structured around the stages of the MRC framework for developing complex interventions.

Year 1: Intervention modelling

- Conduct a systematic review of correlates and predictors of obesity in psoriasis patients to identify mechanisms to include in the intervention including the interaction between negative mood (depression and anxiety), unhelpful thoughts and eating behaviours. The review will be used to formulate an initial theoretical model for the intervention.
- Analysis of existing longitudinal IMPARTS data (routinely collected on psoriasis clinic patients attending St John's Institute of Dermatology, Guys Hospital) to explore associations between depression, anxiety, HRQOL, BMI and medication use on psoriasis disease outcomes.

Year 2:

- Map clinical service protocol: using established NICE pathway for obesity, identify appropriate point where complex cognitive behavioural intervention would sit within current clinical service.
- Conduct qualitative study with psoriasis and co-morbidly obese patients to understand experiences of conditions, needs and expectations of new intervention.
- Develop a multi-component cognitive behavioural intervention for effective weight loss in people with psoriasis and obesity. This would include how depression and anxiety impact emotional eating and motivation for exercise.

Year 3:

- Conduct a feasibility randomised controlled trial to determine whether a fully powered efficacy trial is achievable by examining feasibility of recruitment, acceptability of intervention, weight loss, mood and disease outcomes.

Two representative publications from supervisors:

1: Moss-Morris, R. Dennison, L. Landau, S. Yardley, L. Silber, E. and Chalder, T. (April 2013). A randomized controlled trial comparing cognitive behavioral therapy (CBT) for adjusting to multiple sclerosis (the saMS trial): does CBT work and for whom does it work? Journal of Consulting and Clinical Psychology. 81(2) 251-262 DOI: 10.1037/a0029132

2: Snekvik, I., **Smith, C.** H., Nilsen, T., Langan, S. M., Modalsli, E., Romundstad, P. & Saunes, M. (2017). Obesity, Waist Circumference, Weight Change, and Risk of Incident Psoriasis: Prospective Data from the HUNT Study. Journal of Investigative Dermatology. 137, 12, p. 2484 - 2490

Keywords: Psoriasis; Obesity; Depression; Cognitive behavioural; Feasibility trial;

BRC Theme/s:

Affective Disorders and Interface with Medicine
Obesity, Lifestyle and Learning from Extreme Populations
Clinical and Population Informatics
Patient and Carer Involvement and Engagement
Translational Therapeutics
Clinical Research Facility

OLEP-2.08 Repetitive transcranial magnetic stimulation (rTMS) in anorexia nervosa: An exploration of cognitive mechanisms of change

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Project Description

Background: Treatment of anorexia nervosa (AN) in adults is problematic: 'talking' therapies only lead to remission in 10-40%. Over time, key symptoms of AN, e.g. food restriction and excessive exercise, become highly habitual, which is thought to contribute to their persistence. Little is known about how to reverse these disorder-specific habits, but evidence suggests that new learning needs to occur.

rTMS is a non-invasive brain stimulation method, thought to be one of the most promising emerging treatments for AN in adulthood**.** We have shown in a proof-of-concept trial that high frequency rTMS leads to short-term reductions in AN symptoms and improvements in decision-making (McClelland et al., 2016). We have also recently completed the first ever sham-controlled double blind RCT of rTMS in AN showing improvements in BMI, food-related attention bias and mood compared to sham treatment.

Novelty and Importance: Emerging understanding of the neurobiological effects of rTMS implicates synaptic plasticity and suggests rTMS could be used profitably in combination with other plasticity-inducing interventions, e.g. cognitive training (Cirillo et al., 2017). Very few studies have examined cognitive correlates and predictors of rTMS response in eating disorders (Dalton et al., 2017). We propose to conduct further studies into the effects of rTMS on neurocognition in AN (with a focus on disorder-specific habit-learning and with the longer term aim of exploiting potential synergistic effects of rTMS and cognitive training.

Primary aim(s): To improve our understanding of the effects of rTMS on neurocognitive processes in AN, (particularly disorder-specific habit-learning) and how this relates to symptomatology.

Planned research methods and training provided: The student will receive in-house training in the practicalities of delivering rTMS and using neuronavigation for localisation of the stimuli. They will also attend an established training course into theory and practice of rTMS.

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OLEP-2.08 Repetitive transcranial magnetic stimulation (rTMS) in anorexia nervosa: An exploration of cognitive mechanisms of change

Objectives / project plan:

Year 1: The student will be introduced to theory and practice of different rTMS strategies (e.g. high and low frequency). They will carry out a systematic review of the effects of rTMS on neuro-cognition in psychiatric disorders, to identify the most promising neuro-cognitive targets for further study.

Year 2 and 3: The student will carry out a sham-controlled experimental RCT comparing the effects of one session of low- and high-frequency rTMS applied to the DLPFC in AN patients on neurocognitive outcomes and clinical symptoms.

They will also conduct a case series of therapeutic LF-rTMS (20 session) (not yet studied in AN).

Two representative publications from supervisors:

1: Dalton B, Bartholdy S, Campbell IC, Schmidt U. Neurostimulation in clinical and sub-clinical eating disorders: a systematic update of the literature. Curr Neuropharmacol. 2018 Jan 7. doi: 10.2174/1570159X16666180108111532.

2: McClelland J, Kekic M, Bozhilova N, Nestler S, Dew T, Van den Eynde F, David AS, Rubia K, Campbell IC, Schmidt U. A Randomised Controlled Trial of Neuronavigated Repetitive Transcranial Magnetic Stimulation (rTMS) in Anorexia Nervosa. PLoS One. 2016 Mar 23;11(3):e0148606.

Keywords: Repetitive transcranial magnetic stimulation; rTMS; Eating disorders; Anorexia nervosa; Cognition; Habit learning;

BRC Theme/s:
Affective Disorders and Interface with Medicine
Obesity, Lifestyle and Learning from Extreme Populations
Translational Therapeutics

OLEP-2.09 Combining cognitive bias modification training with transcranial direct current stimulation to reduce illness-relevant cognitive biases (food/exercise) in anorexia nervosa (AN)

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Project Description

Background: Core AN behaviours such as self-starvation, altered food choice behaviour and excessive exercise/overactivity are difficult to shift with conventional psychological therapies. Altered reward processes, learning and habit formation are thought to be key to the persistence of AN and highlight the importance of new learning for improvements to occur. One issue is how best to alter the stability of the learned established pathological state. Evidence indicates that consolidated memories can be made labile and changed by their reactivation (e.g. by CBMT). Another important aspect is that new memory formation at the time of reconsolidation can be changed by neuromodulation, such as tDCS. (see Dalton et al., 2018).

Novelty and Importance: The project is novel because it combines two promising novel brain-directed targeted adjuncts (CBMT, tDCS) to treatment of AN. It will add to the programme of work in this area conducted by our group. Specifically, it will focus on two promising targets, i.e. food and exercise-related stimuli and the modifiability of cognitive biases associated with these using CBMT and tDCS separately and in combination. The project is important because a) there is a need to improve treatment for AN and b) it will inform the debate on the mode of action of tDCS.

Primary aim(s): To improve our understanding of the effects of CBMT and tDCS, separately or combined on food and activity-related attention and approach biases and how this relates to AN symptomatology.

Planned research methods and training provided: The student will receive in-house training in the use of different types of CBMT, eg (a) attention bias modification and (b) approach bias modification and in the delivery of tDCS. He/she will become cognisant with clinical, ethical and theoretical issues associated with eating disorders and with the basic neuroscience associated with neuromodulation.

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OLEP-2.09 Combining cognitive bias modification training with transcranial direct current stimulation to reduce illness-relevant cognitive biases (food/exercise) in anorexia nervosa (AN)

Objectives / project plan:

Year 1: The student will be introduced to the field of eating disorders and associated neurobiological models of illness. He/she will also learn about tDCS and different forms of CBMT and how these procedures are conducted. He/ she will develop their research protocol and obtain associated regulatory (e.g. ethics) approvals and lastly, will write a systematic review (e.g. food/exercise related cognitive biases (attention, approach, memory) in eating and weight disorders.

Year 2 and 3: The student will conduct experimental studies on the effects of food and exercise-related CBMT +/- tDCS on relevant cognitive biases and associated AN symptomatology.

Two representative publications from supervisors:

1: Dalton B, Bartholdy S, Campbell IC, Schmidt U. Neurostimulation in clinical and sub-clinical eating disorders: a systematic update of the literature. Curr Neuropharmacol. 2018 Jan 7. doi: 10.2174/1570159X16666180108111532.

2: Kekic M., McClelland, J., Bartholdy, S., Boysen, E., Musiat, Dalton, B., Tiza, M., David, A. S., Campbell, I. C. and Schmidt, U (2017) Single session transcranial direct current stimulation temporarily improves symptoms mood and self regulatory control in bulimia nervosa: a randomised controlled trial PL o S One . 12, 1, p. e0167606.

Keywords: Anorexia nervosa; Cognitive bias modification; Transcranial direct current stimulation;

BRC Theme/s: Affective Disorders and Interface with Medicine
Obesity, Lifestyle and Learning from Extreme Populations
Translational Therapeutics

OLEP-2.10 Exploring benefits of cognitive training in overweight and obese individuals

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Project Description

Background: Weight loss-focused interventions to help individuals with obesity often are often successful short-term, but fail in the long-term. The development and implementation of novel psychological therapies to support weight loss are key to improve the effectiveness of current treatments.

Novelty and Importance: This project will be an excellent opportunity to explore novel avenues for targeting psychological difficulties in people with obesity. The potential for ameliorating weight loss treatments by targeting key protective and maintaining factors of overeating is huge.

Primary aim(s): The study will recruit 100 obese individuals

- **Principal objective:**

To evaluate the efficacy of adding a brief multi-component intervention targeting executive function, emotion dysregulation, craving and sensitivity to social support in comparison to standard treatment in reducing food craving (at 3 month follow-up) amongst morbidly- and complex-obesity patients.

- **Secondary objectives:**

To evaluate the efficacy of the intervention at secondary end-points (6 months) and to assess eating behaviors, weight, quality of life, executive functioning and cognitive processing of social stimuli.

Inclusion criteria:

- Age >= 18 years old
- BMI > 40 or > 35 with comorbidities linked to obesity
- Selected for bariatric surgery and beginning the preparation program.
- Report at least one craving episode in the 30 days before pre-inclusion screening.

Exclusion criteria:

- Severely impaired physical and/or mental health that may affect the participant's compliance with the study or understanding of assessment tools.
- Difficulty in understanding and/or writing in English.
- Individuals participating in another study that includes an ongoing exclusion period.
- Receiving psychotherapy other than standard obesity care.

OLEP-2.10 Exploring benefits of cognitive training in overweight and obese individuals

Planned research methods and training provided:

1.) Assessment of psychopathology.
2.) Neuropsychological and cognitive assessments.
3.) Collection and analysis of data.
4.) Running focus- and psychoeducation groups.
5.) Writing for publication and presentation skills.
6.) Communicating with main stakeholders: patients, carers, clinicians.
7.) Developing psychoeducation materials.
8.) Public engagement in research.
9.) Possibility to collaborate with industry.

Objectives / project plan:

Year 1: To develop skills and competency in assessment of psychopathology, neuropsychological assessment, CRT and cognitive bias modification training. To conduct and publish a systematic review. Networking with PI's collaborators in France, Germany and Australia. Explore links with industry to develop apps.

Year 2: To deliver a psychological intervention combining CRT and cognitive bias modification and conduct focus groups. To conduct data analysis under guidance. To present findings at international conferences.

Year 3: To publish results in peer-reviewed scientific journals, present findings at national and international conferences, and write thesis.

Two representative publications from supervisors:

1: Raman J, Hay P, Tchanturia K, Smith E (2018) A randomised controlled trial of manualized cognitive remediation therapy in adult obesity. Appetite. doi: 10.1016/j.appet.2017.12.023Cardi V, Tchanturia K, Treasure J (2018) Premorbid and illness-related social difficulties in eating disorders: an overview of the literature and treatment developments. Current Neuropharmacology; doi: 10.2174/1570159X16666180118100028.

2: Cardi V, Esposito M, Bird G, Rhind C, Yiend J, Schifano S, Hirsch C, Treasure J. (2015). A preliminary investigation of a novel training to target cognitive biases towards negative social stimuli in Anorexia Nervosa. Journal of Affective Disorders, 1;188:188-93. DOI: 10.1016/j.jad.2015.08.019.

Keywords: Obesity; Neuropsychology; Cognitive training; Social support; Cognitive bias;

BRC Theme/s: Obesity, Lifestyle and Learning from Extreme Populations
Patient and Carer Involvement and Engagement
Translational Therapeutics

OLEP-2.11 Searching for cognitive characteristics in overweight and obese individuals with autistic symptoms

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Project Description

Background: Little is known about the factors contributing to obesity in autistic adults, nor what can be done to support healthy weight management in this group, considering their unique support needs. Current interventions do not necessarily contain reasonable adjustments to account for the role of autism in an individual's weight, including their sensory experiences and executive function differences.

Novelty and Importance: This project will be an excellent opportunity to examine cognitive, social, and sensory differences between autistic and neurotypical obese individuals. This will lead to the development of an entirely novel cognitive training intervention, establishing the feasibility of manualized Cognitive Remediation Training (CRT) for this group, while respecting the heterogenous nature and needs of being on the autism spectrum.

Primary aim(s): The study will recruit 100 obese individuals, 50 autistic and 50 neurotypical

- **Principal objective:**

To examine differences and similarities in the cognitive and experiential profiles of autistic and neurotypical obese individuals, and to translate these into a tailored brief multi-component intervention for autistic obese individuals.

- **Secondary objectives:**

To evaluate the efficacy of the intervention at secondary end-points (3- and 6- months). Assessing eating behaviors, weight, quality of life, sensory experiences, and cognitive/emotional components. Initial characteristics of these components will be examined as potential modulators of the impact of the proposed treatment.

Inclusion criteria:

- Age >= 18 years old
- BMI > 35

Exclusion criteria:

- Severely impaired physical and/or mental health that may affect the participant's compliance with the study or understanding of assessment tools
- Difficulty in understanding and/or writing in English
- Individuals participating in another study that includes an ongoing exclusion period

OLEP-2.11 Searching for cognitive characteristics in overweight and obese individuals with autistic symptoms

Planned research methods and training provided:

1.) Assessment of psychopathology
2.) Assessment of autism
3.) Neuropsychological assessments
4.) Collection and analysis of data
5.) Running focus- and psychoeducation groups with participants
6.) Learn qualitative data analysis
7.) Writing for publication, presentation skills for national and international conferences
8.) Communicating with main stakeholders: patients, carers, clinicians
9.) Developing psychoeducation materials
10.) Teaching and public engagement opportunities

Objectives / project plan:

Year 1: Develop skills and competency in required assessment measures and CRT. Conduct and publish a systematic literature review with help from supervisors.

Year 2: Conduct intervention and focus groups. Carry out data collection and conduct data analysis under the guidance of supervisors. Present findings at conferences.

Year 3: Publish results, present findings at international conferences, write thesis.

Two representative publications from supervisors:

1: Raman J, Hay P, Tchanturia K, Smith E (2018) A randomised controlled trial of manualized cognitive remediation therapy in adult obesity. Appetite. doi: 10.1016/j.appet.2017.12.023

2: Cardi V, Tchanturia K, Treasure J (2018) Premorbid and illness-related social difficulties in eating disorders: an overview of the literature and treatment developments. Current Neuropharmacology; doi: 10.2174/1570159X16666180118100028

Keywords: Obesity; Neuropsychology; Cognitive training; Planning; Cognitive flexibility;

BRC Theme/s: Obesity, Lifestyle and Learning from Extreme Populations
Patient and Carer Involvement and Engagement
Translational Therapeutics

OLEP-2.12 Food addiction and impulsivity in people with psychosis

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Third Co-supervisor: Dr Carol Kan

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Project Description

Background: Substance-use, both pre-morbidly and co-morbidly, is commonly linked to psychosis, and associations between psychosis and disordered eating behaviours have been observed. Increased appetite and weight gain are common side effects of psychotropic medications with multifactorial underlying mechanisms. The role of food addiction in people with psychosis has not been fully explored, although two preliminary studies suggest that it is a common comorbidity .

Novelty and Importance: An experimental medicine approach will be used to investigate the prevalence and role of food addiction and impulsivity in people with psychosis. This will inform potential treatment avenues for the major health disparities seen in psychosis.

Primary aim(s)

i) To assess the relationship between food addiction and impulsive snack food responsivity in people with psychosis

ii) To identify biological and psychological markers associated with food addiction in psychosis

iii) To explore the acceptability of a computerized training targeting food impulsivity with people in psychosis

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OLEP-2.12 Food addiction and impulsivity in people with psychosis

Planned research methods and training provided: This cross-sectional study will provide training in:

i) Developing reaction-time based computerized tasks using computer programs such as Inquisit and E-prime.

ii) Conducting novel online assessments to collect data on food addiction and impulsivity.

iii) Using advanced statistical analyses for quantitative data, such as linear regression, linear mixed models.

iv) Planning and running focus group about potential implementation of an existing intervention targeting impulsivity in people with psychosis.

Objectives / project plan

Year 1: The objectives are: i) to conduct a systematic review and meta-analysis on food addiction, impulsivity and its association with biological markers and psychological in people with psychosis, ii) to develop and validate experimental tasks and materials, iii) to obtain ethics approval for data collection in people with psychosis at South London and Maudsley NHS Foundation Trust, including the use of C4C contact.

Year 2: The main objectives are i) recruitment of participants, ii) data collection and iii) planning of focus group.

Year 3: The main objectives are: i) data analyses, ii) focus group and iii) dissemination of findings through peer-reviewed publications and conference presentations.

Two representative publications from supervisors:

1: Treasure, J., et al., *Are trans diagnostic models of eating disorders fit for purpose? A consideration of the evidence for food addiction.* Eur Eat Disord Rev, 2018.

2: Turton, R., et al., *Novel methods to help develop healthier eating habits for eating and weight disorders: A systematic review and meta-analysis.* Neurosci Biobehav Rev, 2016. **61**: p. 132-55.

Keywords: Bulimia nervosa; Eating disorders; Impulsivity; Psychosis; Food addiction;

BRC Theme/s:

Affective Disorders and Interface with Medicine
Obesity, Lifestyle and Learning from Extreme Populations
Psychosis and Neuropsychiatry
Patient and Carer Involvement and Engagement
Translational Therapeutics
BioResource