# Short Course Schedule:

## Novel Therapeutic Approaches to Age Related Disorders

**Monday 21\textsuperscript{st} October, 2013**

**Venue:** TCIN, Lloyd Institute, Trinity College Dublin

<table>
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<tr>
<th>Time</th>
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<td>9.00 – 9.30</td>
<td>Coffee</td>
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| 9.30 – 11.30  | 9.30 – 10.30 Lecture 1  
*Healthy Brain/Healthy Ageing*, Sabina Brennan  
10.30-11.30 Lecture 2  
*Cognitive stimulation and rehabilitation*, Ian Robertson |
| 11.30 – 12.00 | Coffee/Tea Break                                                         |
| 12.00 – 13.00 | 12.00 – 13.00 Lecture 3  
*Exercise and enrichment as neuroprotectants: the evidence from preclinical studies*, Aine Kelly |
| 13.00 – 14.00 | Lunch: Sandwiches, Tea and Coffee                                       |
| 14.00-17.00   | 14.00 – 15.00 Lecture 4  
*Multisensory integration in elderly people*, Fiona Newell  
15.00– 16.00 Lecture 5  
*Physical training for the older body and the older brain*, Richard Carson  
16.00-17.00 Lecture 6  
*The VERVE project*, Edmund Lalor |
Shortcourse Programme
CPD Short Course: Novel therapeutic approaches to age related disorders

Accredited for CPD by the Royal College of Physicians of Ireland
RCPI approval reference: pending
CPD credits allowed: pending
This CPD Recognition is accepted by all Irish Postgraduate Training Bodies

INTRODUCTION:
Ageing is the main factor for most chronic diseases, disabilities and declining health. Among them, progressive neurodegenerative disorders are set to become the developed world’s largest socioeconomic healthcare burden over the coming decades. Changing demographics have underscored the necessity to develop novel approaches for the remediation of the cognitive impairment associated with dementias from less severe syndromes such as age-associated cognitive decline (AACD) and mild cognitive impairment (MCI) through to Alzheimer’s Disease. This new shortcourse aims to provide an overview of the most promising therapeutic approaches to age-associated neurocognitive disorders.

Lecture 1. Healthy Brain/Healthy Ageing, Dr. Sabina Brennan
The main objective of the first lecture is to provide an overview of cognitive ageing, brain ageing, emographic ageing and the factors that interact with and influence cognitive decline. Principal outcomes will be: understand key issues around cognitive ageing, outline main theories of cognitive ageing, articulate the influence of psychological, social, and biological factors on cognitive ageing

Lecture 2. Cognitive stimulation and rehabilitation, Prof. Ian Robertson
This talk will review evidence that cognitive function in older people can be improved using a number of planned cognitive intervention studies, and will also consider how cognitive function may be aided using technological aids. It will also consider whether non invasive brain stimulation may have significant effects on cognitive function.

Lecture 3. Exercise and enrichment as neuroprotectants: the evidence from preclinical studies, Dr. Aine Kelly
Many studies have highlighted the potential of lifestyle factors such as diet, physical activity, social interaction and cognitive stimulation to protect the brain from the decline in function frequently seen in old age. In this talk, data from studies in humans and other species that may explain the biological mechanisms underlying these protective effects will be discussed.

Lecture 4. Multisensory integration in elderly people, Prof. Fiona Newell
The focus of the lecture will be on perceptual function in older persons, particularly those with a history of falls. The lecture will also cover the development of novel technology in the assessment and rehabilitation of multisensory perceptual function in older adults.

Lecture 5. Physical training for the older body and the older brain, Prof. Richard Carson
Older adults who undertake physical training are typically seeking to maintain or increase their strength with a view to preserving or improving their functional capabilities. It is now evident that various forms of physical training have a positive influence upon brain function. The focus of this lecture will be upon the principles that govern neural and muscular adaptations to physical training in older people. An appreciation of these principles is necessary for the optimum design of intervention programs that have as their aim the improvement of functional capacity.

Lecture 6. The VERVE project, Dr. Edmund Lalor
This lecture will discuss state-of-the-art computer science and engineering-based interactive technologies aimed at supporting the treatment of people who are at risk of social exclusion due to fear and apathy associated with ageing or a neurological disorder. It will discuss progress on the recent VERVE project (Personalised Virtual Reality Scenarios for Groups at Risk of Social Exclusion) and how it aims to apply leading edge research to simulate personalised and populated virtual reality (VR) environments, 3D web graphics, and ‘serious’ games as a means to addressing some of the challenges faced by the target groups. The project focuses on three situations, each targeting a different group of participants: fear of falling and Parkinson’s disease; apathy related to cognitive decline and behavioural disturbances, in particular due to Alzheimer’s Disease; and other emotional disturbances linked to anxiety.
Dr. Sabina Brennan, Trinity College Institute of Neuroscience: she is Director of the NEIL Memory Research Unit, which she established in collaboration with Professor Robertson and Professor Lawlor in 2011. Her current research interests are in understanding differentia decline in cognitive ageing, the early detection of cognitive decline, and the development of interventions to prevent decline.

Prof. Ian Robertson, Trinity College Institute of Neuroscience: he’s dedicated to developing non-pharmacological methods for enhancing brain function, particularly in ageing, but also in conditions such as traumatic brain injury, autism, schizophrenia and attention deficit disorder.

Dr Aine Kelly, Trinity College Institute of Neuroscience: she’s particularly interested in the cellular mechanisms by which interventions such as environmental enrichment and physical exercise can improve cognition in young, healthy laboratory animals and protect against degenerative changes caused by ageing and by experimentally-induced neuronal cell damage.

Prof. Fiona Newell, Trinity College Institute of Neuroscience: her research aim is to elucidate the behavioural and cortical correlates of multisensory perception in humans for the purpose of texture, object, face and scene recognition. This research is mainly conducted with normal adult populations but also involves investigations of multisensory perception in ageing, in persons who are sensory deprived and in synaesthesia.

Richard Carson, Trinity College Institute of Neuroscience: his research focuses upon the development of novel approaches to the amelioration of age-related cognitive and behavioural dysfunction. In this context, a pivotal role is ascribed to methods and applications that optimise the utilisation of adaptive brain plasticity.

Edmund Lalor, Trinity College Institute of Neuroscience: his research interest is in: Processing of electrophysiological signals reflecting activity of human sensory systems, Multisensory integration, Effects of selective attention on sensory and perceptual processing, Computational modelling of the visual system at various hierarchical levels, The encoding and decoding of sensory information in populations of neurons, Sensory deficits in schizophrenia and autism, Brain-computer interfacing.