About the Speaker

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Professor Irene Tracey is Warden of Merton College, Oxford, which is one of Oxford's oldest undergraduate and graduate colleges dating back to 1264. She will be the second woman to hold the post beginning her role in October 2019. Irene is also Professor of Anaesthetic Neuroscience in the Nuffield Department of Clinical Neurosciences and Pro-Vice-Chancellor at the University of Oxford. Irene did her undergraduate and graduate studies in Biochemistry at the University of Oxford (Merton College) from 1985-1993 graduating with joint top-First and winning the Gibb's Prize. She was senior scholar at Merton College and a Wellcome Prize PhD student for her doctoral studies in Magnetic Resonance Spectroscopy working with Professor Sir George Radda. She then held a postdoctoral position at Harvard Medical School until 1996 working at the MGH-NMR (now Martinos) imaging centre. In 1997, Irene returned to Oxford and was a founding member of the now world-leading Oxford Centre for Functional Magnetic Resonance Imaging of the Brain (FMRIB) and she was its Director from 2005 until 2015. Irene was tenured in 2001 at Oxford and was a tutorial fellow in medicine at Christ Church and Lecturer in the Department of Physiology and Genetics prior to taking up the Directorship of FMRIB and followed in 2007 by appointment to the Nuffield Chair in Anaesthetic Sciences with Fellowship at Pembroke College. Until recently she was also Head of the Nuffield Department of Clinical Neurosciences – a 550 person strong department of scientists and clinicians drawn from neurology, ophthalmology and anaesthetics. Over the past 20 years her multidisciplinary research team has contributed to a better understanding of pain perception, pain relief and nociceptive processing within the injured and non-injured human central nervous system using advanced neuroimaging techniques and novel paradigm designs. More recently, they have been investigating the neural basis of altered states of consciousness induced by anaesthetic agents. Her work has both discovery and translational elements and has contributed to a fundamental change in how we view pain as an emergent experience not simply related to nociceptive inputs.

Alongside senior leadership roles within the University, Irene has served and continues to serve on many national and international committees, such as the International Association for the Study of Pain (IASP), REF2014, British Neuroscience Association and Lundbeck Brain Prize Committee. She is currently appointed by government to the Council of the Medical Research Council. She is a passionate advocate for women in science and is involved in several mentorship schemes. In 2008 she was awarded the triennial Patrick Wall Medal from the Royal College of Anaesthetists and in 2009 was made an FRCA for her contributions to the discipline. In 2015 she was elected a Fellow of the Academy of Medical Sciences and in 2017 won the Feldberg Foundation Prize followed in 2018 by the British Neuroscience Association's Outstanding Contribution to Neuroscience award.

She is married to Professor Myles Allen, a climate physicist, and they have three children: a daughter and two sons.

About the Lecture

The ability to experience pain is old and shared across species. Acute pain is the body's alarm and warning system, and as such a good thing. Chronic pain is the system gone wrong and is now one of the largest medical health problems worldwide with one in five adults defined as having chronic pain. It is now considered a symptom or disease in its own right and it produces untold suffering alongside being a major financial burden to society. The brain is key to the experience of pain and pain relief. Relating specific neurophysiologic measures from advanced brain imaging to changes in pain perception induced by peripheral or central sensitisation, psychological or pharmacological mechanisms has tremendous value. Identifying where functional and structural plasticity, sensitisation and other amplification or attenuation processes occur along the pain central neuraxis (i.e. brain, brainstem and spinal cord) for an *individual* and relating these neural mechanisms to specific pain experiences, measures of pain relief, persistence of pain states, degree of injury and the subject's underlying genetics, has neuroscientific and potential diagnostic relevance. A key area of development has been pharmacological imaging where objective evidence of pharmacodynamic efficacy can be obtained providing useful information to aid analgesic drug development that oftentimes is hampered by over-reliance on subjective pain ratings. More recently, researchers have been investigating through brain imaging whether there is a pre-disposing vulnerability or resilience in neural networks towards developing chronic pain. As such, advanced neuroimaging studies can powerfully aid ***explanation*** of a subject's multidimensional pain experience, analgesia and even what makes them vulnerable to developing chronic pain. The application of this goes beyond the clinic and has relevance in courts of law, and other areas of society that will be discussed in my talk.

Relatively far less work has been directed at understanding what changes in the brain occur during altered states of consciousness induced either endogenously (e.g. sleep) or exogenously (e.g. anaesthesia). However, that situation is changing rapidly. For example, our recent multimodal neuroimaging work explores how anaesthetic agents produce altered states of consciousness such that perceptual experiences of pain and awareness are degraded. This is bringing us fascinating insights into the complex phenomenon of anaesthesia and the concept of self-hood.