INT Symposium on "Advanced Photonic Imaging in Neuroscience"

11th and 12th July 2019 Marseille, France

DUGUID Ian

Wellcome Trust Senior Research Fellow

Professor of Cellular & Systems Neuroscience

Centre for Discovery Brain Sciences

University of Edinburgh

Ian.Duguid@ed.ac.uk

Ian Duguid studied Pharmacology as a bachelor student at the University of Aberdeen (1994-1998). During his PhD studies under the supervision of Prof. Trevor Smart at the London School of Pharmacy (1998-2001), he investigated presynaptic plasticity mechanisms in the cerebellum which he continued with Trevor as an MRC postdoctoral fellow at University College London (2001-2006). During his senior postdoctoral years Ian was awarded a Wellcome Trust Advanced Training Fellowship to work with Prof. Michael Hausser at UCL (2006-2009) to investigate sensory information processing in single cerebellar neurons in vivo. In 2009, Ian was awarded a Wellcome Career Development fellowship to start his own lab at the University of Edinburgh (2009-2014) and more recently a Wellcome Senior Research Fellowship (2015-2021) to investigate the cellular and circuit mechanisms underpinning cortical motor control of adaptable movement.

S3-L4 '*Thalamocortical control of skilled movement.*'

Joshua Dacre[1], Matt Colligan[1], Julian Ammer[1], Victor Chamosa Pino[1], Julia Schiemann[1], Federico Claudi[1], Alex Harston[1], Janelle M Pakan[1], Nathalie NL Rochefort[1,2] Cheng-Chiu Huang[3], Adam Hantman[3], & Ian Duguid[1,2]

[1]Centre for Discovery Brain Sciences and Patrick Wild Centre, Edinburgh Medical School: Biomedical Sciences, University of Edinburgh, Edinburgh, EH8 9XD, UK.

[2]Simons Initiative for the Developing Brain, University of Edinburgh, Edinburgh EH8 9XD, UK.

[3]Janelia Research Campus, Ashburn, Virginia 20147, USA.

Motor thalamus serves as a gateway to the cortex, relaying sensorimotor information from subcortical structures to motor areas of the cerebral cortex. But how coordinated motor control emerges from interactions between cortical and subcortical structures remains unresolved. To address this issue, we developed a cued linear forelimb push task for mice that requires descending cortical output, skilled object manipulation and associative learning. By combining this forelimb motor task with GRIN lens-mediated 2-photon population calcium imaging, in vivo electrophysiology, pathway-specific pharmacological / optogenetic manipulation strategies and 2D kinematic analysis, we describe the causal mechanisms that link motor thalamic population activity with primary motor cortex L5B projection neuron dynamics during movement initiation.