

Symposium 2: Spinal motor control: more than just a reflex

Theme: Sensory and motor systems

Monday 10th April, 13:00 – 14:40

Although it is well accepted that everyday movements are controlled by multiple motor centres in the brain, the spinal cord is often considered to be little more than a relay station for cortical commands. However, it is becoming increasingly evident that it has a more active role to play in motor control, and this role can be more prominent following damage such as from spinal cord injury (SCI).

In this session we will present and discuss anatomical, behavioural and electrophysiological evidence from research in animal models and in humans, showing how the spinal cord can be much more engaged in the voluntary control of movements and how this can impact recovery after injury.

Maxwell will describe anatomical evidence on how spinal commissural systems can interact with descending commands to sculpt motor output of the limbs. Soteropoulos will discuss how primate spinal cord interneurons contribute to voluntary movements of either or both upper limbs. Ichiyama will discuss his work on how combinatorial approaches in a rodent model of SCI can benefit recovery of limb function. Finally, Perez will discuss rehabilitative approaches that target the spinal cord for improvement of upper limb function in patients with SCI.

The diverse approaches and models discussed in this symposium will demonstrate the important contribution of spinal circuits in motor control in health and disease, above and beyond the well-known stretch reflex.

Chair: Dr Demetris Soteropoulos (University of Newcastle)

Co-chair: Professor David Maxwell (Glasgow University)

Speaker 1: Professor David Maxwell (Glasgow)

'Descending control of bilateral circuits controlling limb movement'

Speaker 2: Dr Demetris Soteropoulos (Newcastle)

'The activity of primate spinal cord interneurons during movements with either or both upper limbs'

Speaker 3: Dr Ronaldo Ichiyama (Leeds University)

'Combinatorial approaches to promoting recovery of limb function in rats with chronic spinal cord injury'

Speaker 4: Ms Monica Perez (The Miami Project to Cure Paralysis, Miami)

'Approaches to promote recovery of upper-limb function in humans with spinal cord injury'