

## Scientific/Educational Workshop

### Workshop information

#### Workshop responsables :

Winnie Jensen  
Thomas Stieglitz

#### Workshop title :

Novel technologies & natural sensory feedback for phantom limb pain modulation and therapy

#### Workshop goals:

In this special session we will introduce novel, invasive and non-invasive technologies and routes to deliver sensory feedback with the aim to modulate phantom limb. We will discuss challenges to design and evaluate multi-center clinical trials, and translate research results into clinical applications and provide long-term, patient-specific solutions to a large group of patients.

#### Abstract:

Phantom limb pain (PLP) is a frequent consequence of amputation, and it is notoriously difficult to treat. Despite isolated reports of success, no medical/non-medical treatments have been beneficial on more than a temporary basis. Recent evidence suggests that the pathophysiological mechanism of PLP is related to neuroplastic changes in the cortex that may be driven by appropriate sensory feedback. In the EU funded project EPIONE we have directly compared an invasive and a non-invasive route to offer more long-term or permanent therapies for amputees suffering from phantom limb pain. Our specific objectives to overcome the current challenges and problems are; 1) Through coordinated multi-centre clinical trials, we aim to assess the effectiveness of providing invasive/non-invasive sensory feedback (direct peripheral nerve stimulation/mechanical pressure or electrical stimulation) with or without simultaneous operation of hand prosthesis device for controlling phantom limb pain, 2) We aim to assess the associated cortical neuroplastic, psychological and cognitive components of pain, 3) We aim to provide clinical guidelines. and 4) We aim to build novel innovative technological pre-industrial systems for delivering invasive/non-invasive sensory feedback based on existing solutions emerging from previous funded EU research.

#### Confirmed Speakers:

Ken Yoshida  
Thomas Stieglitz  
David Guiraud  
Winnie Jensen