

Project Title: Genetic Control of Locomotion

Supervisor: César S. Mendes, PhD Institution: CEDOC

Webpage: <http://cedoc.unl.pt/neurogenetics-of-locomotion/>

Contact: email/phone: cesar.mendes@nms.unl.pt / +351 218803110, Ext. 27014

Location of research lab/research center: Centro de Estudos de Doenças Crónicas (CEDOC/FCM/UNL) Campo Mártires da Pátria, 130 1169-056 Lisboa

Summary: Our research aims to understand the mechanisms, genes and circuits that govern coordinated locomotion under normal or pathological conditions. For this we use a genetically tractable model system, the fruit fly *Drosophila melanogaster*, which combines powerful genetic tools with sophisticated and detailed kinematic quantification approaches. This combination allows assigning a gene or neuronal circuit to a specific aspect of motor control. Considering how motor systems and the genes that define them are evolutionarily conserved, our work will impact the study of motor control of more complex organisms and lay the foundation for the study of human pathologies as diverse as Amyotrophic Lateral Sclerosis (ALS), Spinal Muscular Atrophy (SMA) and rehabilitation upon stroke or incapacitating lesions.

Our research projects include a.) Determine the role of motor circuits in fine motor control; b.) Understand the genes and mechanisms regulating motor plasticity; c.) Develop motor disease models in the fruit fly; and d.) Understand the role of sensory feedback on the walking behavior.

Bibliographic references:

CS Mendes*, SV Rajendren, I Bartos, S Márka, RS Mann*. (2014) “Kinematic responses to changes in walking orientation and gravitational load in *Drosophila melanogaster*”, *PLoS ONE* 9(10): e109204.

CS Mendes, I Bartos, T Akay, S Márka, RS Mann. (2013) “Quantification of gait parameters in freely walking wild type and sensory deprived *Drosophila melanogaster*”. *eLife*, January 8.