SYSTEMS-NET WEBINAR SERIES

SYSTEMS PHYSIOLOGY

Wednesday, 5th November 2014 12:30 p.m.

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Webinar Overview

The content of this webinar will cover the genesis of the multi-scale engineering concept and provide its physiological context within a systems framework. '*How to mend a broken heart…*' will cover current work undertaken in Loughborough, Rennes and Paris in order to better understand the 'tetralogy of Fallot' – a congenital cardiac disorder that is the most common cause of 'blue baby' syndrome. To understand its pathophysiology it is necessary to investigate normal heart development. A cellular Potts model will be used to simulate epithelial to mesenchymal transition in cells, a way in which structure in the heart is developed, and a causal mechanism of one of the pathological features of tetralogy of Fallot. Possible future scenarios on how the research collaboration can develop will be discussed before an explicit example of how engineering methods have been used to further our understanding of the dynamics of cardiac development *in utero*.

Presenter

Ron Summers is Professor of Information Engineering at Loughborough University. He is an alumnus of the Department of Systems Science at City University having studied there between 1984 and 1989, after which he made the switch to academic staff. His PhD investigated the use of artificial intelligence in the weaning of patients off mechanical ventilator support. Since then his principal research efforts have been made in biomedical engineering and medical informatics. Through participation in EU funded projects and membership of international biomedical engineering organisations, Ron has access to an extensive network of researchers – it is through such network contacts that enabled the work that is to be presented in this webinar.

He moved to Loughborough University in 1998 to take up a Chair in Information Science, transferring in 2008 to the School of Electronic, Electrical, and Systems Engineering. Ron's current research centres on developing a systems interpretation of the multi-scale representation of physiological systems and using it to derive added value in the prevention and/or diagnosis of disease and measurable impact in therapeutic interventions.

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Dr Gema Styles
EPSRC UK Systems-NET Researcher and Coordinator
www.systems-net.org
School of Electronic, Electrical and Systems Engineering
Loughborough University Tel 01509 635667