

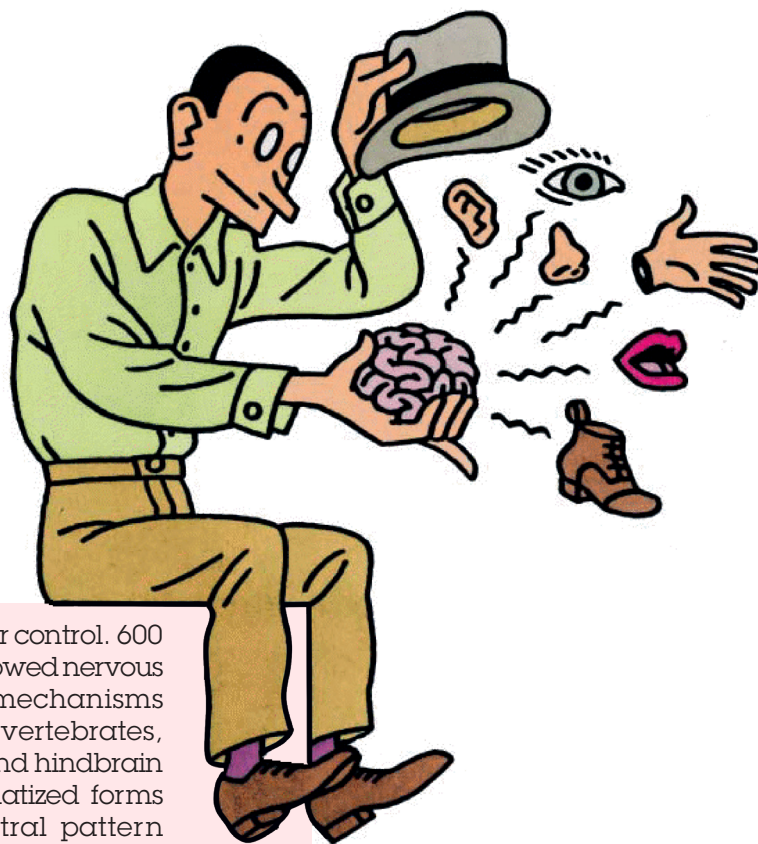
TWENTY-THIRD ANNUAL
DEPARTMENT OF NEUROSCIENCE
SEMINAR SERIES

JOSEPH PATON

Champalimcrud foundation, Lisbon,PT

FEBRUARY 5, 2024

**Hierarchy and heterarchy of
circuit mechanisms for behavioral**



The brain, broadly speaking, is for control. 600 million years of evolution has endowed nervous systems with a multitude of mechanisms for achieving that control. In vertebrates, mechanisms in the spinal cord and hindbrain are responsible for more automatized forms of control: reflex circuits, central pattern generators, and circuits for movement primitives. These processes can be selected amongst, modulated, and chained together by the descending influence of brain systems positioned more rostrally that possess a rich capacity to learn from experience. It is these more adaptive systems that my laboratory is most interested in understanding. And yet, control by these systems appears to be fundamentally both heterarchical, requiring distinct computations performed by specific brain systems, and hierarchical, with each system operating at varying degrees of abstraction in relation to the immediate physical world. In this talk, I will describe how experiments in my laboratory focused on understanding how neural circuits are provided a temporal basis computation have revealed not only fundamental principles underlying temporal processing, but also signatures of how hierarchies of representations can interact to produce robust policies for behavior, and how distinct aspects of behavioral control appear to be handled by different brain systems.

Erasmus MC
University Medical Center Rotterdam



Time: 17.00 hrs

Location: Querido Lecture Hall

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