

Tentative Outline

Special Thematic Issue for the journal

Subcortical contribution to the role of the Basal ganglia in action selection

Guest Editors: Veronique Coizet and Frederic Ambroggi

- **Scope of the Thematic Issue:**

The basal ganglia are one of the fundamental processing units of the vertebrate brain. As such they have evolved multiple connections with most regions of the cerebral cortex, limbic system, thalamus, and numerous structures in the hindbrain. Despite numerous suggestions that the basal ganglia are involved in a wide range of functions, it is now widely accepted to evidence an underlying role of this network in basic selection processes (Mink 1996, Redgrave et al. 1999) and goal directed behavior (Mink, 1996). The anatomy and function of the basal ganglia has been extensively studied in relation to the cortex. Connections between the cerebral cortex and basal ganglia can be viewed as a series of parallel projecting loops or channels (Alexander et al., 1986; Middleton and Strick 2000). Much experimental evidence now supports the concept that cortico-basal ganglia-thalamo-cortical channels have an important anatomical and functional significance (Alexander et al., 1986; Parent and Hazrati, 1995; Middleton and Strick, 2000). However, prior to the evolutionary expansion of the cerebral cortex, it was probably the co-evolution of the basal ganglia with subcortical structures that established a basic circuitry onto which the cortex was later grafted (Reiner, 2010). For example, the concept of potentially segregated parallel projecting loops through the basal ganglia has been extended to their connections with sensorimotor and motivational structures in the brainstem (including the superior colliculus, periaqueductal grey, pedunculo-pontine and parabrachial nuclei (McHaffie et al. 2005), thalamus and cerebellum. This subcortical network has long been underestimated and understudied while recent innovative studies highlight their contribution to the role of the basal ganglia in action selection. The purpose of this thematic issue is (to be completed after confirmation of the authors contribution).

Keywords: 6 to 8 keywords should be provided. Basal ganglia, brainstem, thalamus, cerebellum, action selection

Sub-topics:

The sub-topics to be covered within the issue should be provided:

- Basal ganglia evolution
- Brainstem interaction with the basal ganglia
- Thalamic interaction with the basal ganglia
- Cerebellum interaction with the basal ganglia

Tentative titles of the articles and list of contributors:

Tentative titles of the articles and list of contributors with their names, designations, addresses and email addresses should be provided.

- **Basal ganglia evolution**

- Pr Sten Grillner (Sten.Grillner@ki.se)
- Professor Sten Grillner, Department of Neuroscience, Karolinska Institute, Stockholm
- **Pre-response YES**

- **Brainstem interactions with the basal ganglia**

- Sensory reinforced corticostriatal plasticity (research paper).

Nicolas Vautrelle, Véronique Coizet, Mariana Leriche, Lionel Dahan, Jan M. Schulz, Yan Feng Zhang, Abdelhafid Zeghib, Paul G. Overton, Enrico Bracci, John N.J. Reynolds and Peter Redgrave.

Corresponding author: John N.J. Reynolds - john.reynolds@otago.ac.nz

Professor John Reynolds, University of Otago, Brain Health Research Centre, New-Zealand.

Pre-response YES.

- Sabatini LB (bsabatini@hms.harvard.edu) - Suggestion of a review based on the following article: Role of the striatal – Collicular interactions for exploratory behavior.

-Patton JJ (joe.paton@research.fchampalimaud.org) -Functional characterization of basal ganglia output to the brainstem

- Tamietto M / Celeghin A (marco.tamietto@unito.it; alessia.celeghin@unito.it) – Suggestion of a review based on the following article: A subcortical network linking the superior colliculus to the striatum for implicit visuo-spatial attention?

Dr Celeghin and Dr Tamietto, Department of Psychology, University of Torino, Torino, Italy

Pre-response YES

- Costa RM / Kleinfeld D (rc3031@columbia.edu; dk@physics.ucsd.edu) – Suggestion of a review based on the following article: Specific populations of SNr output structure of the basal ganglia – involvement in action selection.

-Doig N (natalie.doig@bndu.ox.ac.uk) – Brainstem input to the GPe.

Pre-response YES

Dr Doig N, University of Oxford, Medical Research Council Brain Network Dynamics Unit, Oxford, United-Kingdom

- Brainstem projections to the input structures of the basal ganglia, involvement in action selection (review).

Coizet V, Pautrat A, Al Tannir R and Overton PG

Corresponding author: Paul G Overton: p.g.overton@sheffield.ac.uk

Pre-response YES

Pr PG Overton, University of Sheffield, Department of Psychology, Sheffield, United-Kingdom.

- Juan Mena- Segovia (juan.mena@rutgers.edu) – Suggestion of a review with the following keywords: PPN, Basal Ganglia and Action selection.

Pre-response YES

Dr Juan Mena-Segovia, Center for Molecular and Behavioral Neuroscience, Aidekman Research Center, Rutgers University, Newark, United-state of America.

- Canteras NS (newton@icb.usp.br) – Suggestion of a review on the role of the periaqueductal grey nucleus input to the basal ganglia.

Pre-response YES

Pr Newton S Canteras, University of Sao Paulo, Department of Anatomy, Institute of Biomedical Sciences, Sao Paulo, Brasil

- Wilbrecht L (wilbrecht@berkeley.edu) - Suggestion of a review based on the following paper: A basal ganglia circuit for evaluating action outcomes (habenula to globus pallidus projection) or Cell-type-specific control of

brainstem locomotor circuits by basal ganglia

-Arber S (silvia.arber@unibas.ch): Suggestion of a review on the role of the mesencephalic locomotor region inputs to the basal ganglia

➤ **Thalamic interactions**

- Meffre J and Ambroggi F– Implication of paraventricular inputs to the ventral striatum in motivational control.

Corresponding author: Ambroggi F, frederic.AMBROGGI@univ-amu.fr

Pre-response YES

Dr Ambroggi Frédéric, University Aix-Marseille, Institute of Cognitive Neuroscience, Marseille, France

- Kimura M (mkimura@lab.tamagawa.ac.jp) - Role of parafascicular thalamic inputs to the striatum in action rebias

-Laura A Bradfield (Laura.Bradfield@uts.edu.au) – Role of the thalamostriatal projection in the control of goal-directed actions

Pre-response YES

Dr. Laura Bradfield, School of Life Sciences, University of Technology Sydney (St. Vincent's Campus), Darlinghurst, Australia

➤ **Cerebellum interactions**

- Andreea C Bostan and Peter L Strick (acb42@pitt.edu / strickp@pitt.edu) - Suggestion of a review based on the following article: The basal ganglia and the cerebellum: nodes in an integrated network.

- Khodakhah K (k.khodakhah@einsteinmed.org): Suggestion of a review on the integration of cerebellar inputs to the basal ganglia

Pre-response YES

Dr Kamran Khodakhah, Albert Einstein College of Medicine, New York, United-State of America

- Pidoux L (ludivine.pidoux@gmail.com) – Cerebellum / basal ganglia in song learning

Schedule:

- ✧ Thematic issue submission deadline: We have to submit the tentative outline first. Once accepted, we should have 9 months before to submit the articles. I estimate the submission to be around september / october 2022, and we are always allowed to have a little delay if needed. Ideally, the tentative outline should be submitted end of Decembre 2021.

Contacts:

Guest Editor Name: Coizet Veronique

Affiliation: Univ. Grenoble Alpes, Inserm, U1216, Grenoble Institut Neurosciences, 38000 Grenoble, France

e-mail: veronique.coizet@univ-grenoble-alpes.fr