

# 12th International Basal Ganglia Society Meeting IBAGS-XII 2017

Mérida, Yucatán. México  
March 26-30 2017



# IBAGS 2017 Merida TIMETABLE

Saturday March 25 9:00-14:15 hs	Sunday March 26		Monday March 27	Tuesday March 28	Wednesday March 29	Thursday March 30	Friday March 31	
	Article publishing tutorial by P. Bolam 9:00-10:00 hs		Breakfast 7:00 - 8:30	Breakfast 7:00 - 8:30	Breakfast 7:00 - 8:30	Breakfast 7:00 - 8:30	Breakfast 7:00 - 8:30	
IBAGS 2017 & MDS  <b>Clinical Workshop</b>  specially designed for clinical practitioners and residents (see sessions)  JA Obeso J Bargas	Arrival Registration	11:00 hs	Session 1 8:30-10:30 hs	Session 4 8:30-10:30 hs	Session 5 8:30-10:30 hs	Session 8 8:30-10:30 hs	Departure	
	Free time: explore Merida's downtown Avenues nearby	Basic	Coffe break 10:30 – 11:00 hs	Optional excursions to: 1) Chichen Itza 2) Uxmal or 3) Dzibilchaltun & beach (Progreso)	Coffe break 10:30 – 11:00 hs	Coffe break 10:30 – 11:00 hs		
		Science						
	Tutorial (Mercuri)							
	Council Meeting 16:00-18:00 hs		Session 2 11:00 -13:00 hs			Session 6 11:00 - 13:00 hs	Session 9 11:00 -13:00 hs	
	<b>Paul Bolam</b> (founder lecture) 18:15-19:30 hs		Free time 13:00 - 15:00 hs			Free time 13:00 -15:00 hs	Free time 13:00 -15:00 hs	
	Welcoming reception (beer, wine, tacos) 20:00 hs		Poster session (wine & cheese) 15: 00 -18:00 hs			Poster session (wine & cheese) 15: 00 -18:00 hs	Session 10 15:00 -17:00 hs	
Session 3 18:00 -20:00 hs			Basal Ganglia model R. Costa & A. Kretzer Mod: D.J. Surmeier 18:00 -20:00 hs		Session 7 18:00 -20:00 hs	Good bye Party at Chenkú Hacienda 19:00 hs		
Enjoy Merida			Enjoy Merida	Enjoy Merida				

**Clinical Workshop: Merida Room**

**Oral Sessions: Yucatan II, III & IV Room**

**Council Meeting: Celestun Room**

**Poster Sessions: Yucatan I Room (All posters will be presented both days)**

**Saturday March 25 2017**

International Basal Ganglia Society Clinical Workshop 2017  
In collaboration with the International Parkinson and Movement Disorder Society

**Scientific Basis of Movement Disorders:  
Pathophysiology and Pharmacology of the Basal Ganglia**  
Merida Room

Chaired by Jose A. Obeso and Jose Bargas

9: 00-9:10 Welcome and Introduction: Jose A. Obeso and Jose Bargas.

9:15-10:00 **Paul Bolam.UK:** Functional Anatomy of the Basal Ganglia: Relevance to Movement Disorders

10:00-10:45 **Hagai Bergman.Israel:** Cortico-basal ganglia circuits in the parkinsonian state

10:45-11:30 **William D. Hutchison.Canada:** Microelectrode recording methods for neurosurgical targets in basal ganglia and motor thalamus

General Discussion

11:45-12:15 Coffee break

12:15-12:30 **Jose A Obeso. Spain.** The Shaking Palsy 200 years later- Achievements and Challenges

12:30-13:15 **Erwan Bezard.France:**  $\alpha$ -Synuclein Pathophysiology: Therapeutic Implications

13:15-14:00 **Alessandro Stefani.Italy:** Deep Brain Stimulation: The mechanisms of action

General Discussion

Closing Remarks. Jose Bargas

14:15 Lunch

Publishing Workshop

By Paul Bolam Oxford University, UK) co-Editor of the European Journal of Neuroscience

Yucatan II Room

**How a scientific paper is handled by a journal and  
what we expect in a good paper**

Topics to be covered:

- How a paper is handled once submitted to a journal
- What happens to your paper?
- The 'peer-review' system
- What the Editors do
- What the Reviewers do
- How to respond to Reviewers' comments
- Ethics of publishing human subjects, animals, plagiarism)
- What we expect in a good paper

**Sunday, March 26 beginning at 11:00 AM**

**Selected topics in Basic Science Research**

(Basic Science Tutorial)

Yucatan II Room

*Chaired by: Nicola B. Mercuri.* University of Rome Tor Vergata, Italy

Usefulness of Basic Research to understand neurological diseases of the basal ganglia

*Mike Beckstead.* University of Texas Health Science Center, San Antonio, USA

Optogenetics as a tool: probing synaptic plasticity in the dopaminergic system

*Karina Possa Abrahao.* NIAAA, USA

Ethanol effects on specific neurons and synapses of the Basal Ganglia

*Carlos A. Paladini.* University of Texas, San Antonio, USA

Dopamine Neurons In Vivo

*Jeffrey Conn.* Vanderbilt University, USA

M4 muscarinic receptors modulating striatal and nigral dopamine signaling

*Hitoshi Morikawa.* University of Texas, Austin, USA.

Calcium regulation of neuronal activity and plasticity in the mesolimbic system

**Sunday, March 26 evening at 16:00 - 18:00**

**Council Meet**

Celestun Room

**Sunday, March 26 evening at 18:15 - 19:30**

**Opening Ceremony**

Founder Member Conference

Yucatan II Room

*Paul Bolam.* Oxford Univ, UK

Reflections on the Basal Ganglia and Parkinson's Disease

20:00 WELCOMING RECEPTION. (BEER, WINE & TACOS)

ALL ORAL PRESENTATIONS WILL BE HELD IN THE YUCATAN II & III ROOM

ALL POSTER PRESENTATIONS WILL BE HELD IN THE YUCATAN I ROOM



*Co-sponsor of the meeting*

**Prof. Paul Bolam FMedSci**

**Emeritus Professor and Senior Scientist:** Paul Bolam is emeritus Professor of Anatomical Neuropharmacology and emeritus Senior Scientist at the MRC Brain Networks Dynamics Unit at the University of Oxford. Paul's research has focused on understanding the neuronal networks that constitute the basal ganglia by anatomical and combined quantitative anatomical and physiological approaches in health and in disease models, and he has published over two hundred articles on the subject.

Paul graduated in Pharmacology at Chelsea College University of London) in 1975. He then took up a graduate studentship at King's College Hospital Medical School University of London) and was awarded his Ph.D. in 1979. The same year, he joined the Department of Pharmacology at the University of Oxford, and remained in post until 1983 when he was awarded an MRC Senior Research Fellowship.

With his arrival in Oxford, Paul changed fields of research to join a team working on the anatomy and neuropharmacology of the basal ganglia, and has continued in this field ever since. In 1985, Paul became a founder-member of the MRC Anatomical Neuropharmacology Unit. He still works closely with colleagues at the Oxford Parkinson's Disease Center. He is also very active in public engagement in science, talking to school groups, patient and carer groups, and also giving public lectures.

Paul is also an Advisory Editor of Trends in Neuroscience, and a member of the editorial boards of several other journals. He has previously served as Secretary of the British Neuroscience Association, as President of the International Basal Ganglia Society, as a member of the Medical Research Council Neuroscience and Mental Health Board, and as Chair of the Research Advisory Panel of Parkinson's UK. In 2011, Paul was elected a Fellow of the Academy of Medical Sciences and, in 2012, a Fellow of the British Pharmacological Society.

Paul is currently co-Editor in Chief of the European Journal of Neuroscience. The journal is a peer-reviewed scientific journal in the field of developmental, molecular, cellular, systems, behavioral, and cognitive neuroscience. It was established in 1989 with Rainer Guillery then at the University of Oxford) as the founding editor-in-chief. Currently the journal is edited by John J. Foxe University of Rochester School of Medicine and Dentistry) and Paul Bolam Oxford University). The journal is published by the Federation of European Neuroscience Societies in collaboration with Wiley-Blackwell.

**Monday, March 27 morning 8:30 - 10:30hs**

### **Session I Pathophysiology of Parkinson's disease**

Organizational levels: from molecular to systems & behavior

*Chair: Thomas Boraud.* U. Bordeaux, France

1. *Laura Volpicelli.* University of Alabama, Tuscaloosa, USA  
G2019S-LRRK2 expression increases the mobile pool of  $\alpha$ -synuclein and accelerates recruitment to alpha-synuclein inclusions
2. *Erwan Bezard.* CNRS, Bordeaux, France  
Parkinson's disease is a prion disease
3. *Emilie Syed.* MRC, Oxford, UK  
Dynamics of striatal dopamine release related to movement and reward
4. *Aude Retailleau.* Univ of Haifa, Haifa, Israel.  
Dopamine depletion in the striatum disrupts spatial learning.
5. *Jose A. Obeso.* Centro Integral en Neurociencias A.C. HM Cinac, Spain  
Pathophysiology of PD: Findings and lessons from focal interventions

10:30 – 11:00 Coffee Break

**11:00 - 13:00hs**

### **Session II Establishment of cellular identity and function in the striatum**

Organizational levels: molecular to systems

*Chair: Jens Hjerling-Leffler.* Karolinska Institutet, Sweden

1. *Yevgenia Kozorovitskiy.* Northwestern Univ. USA  
Neuromodulation of postnatal synaptogenesis
2. *Tommas Ellender.* Oxford Univ. UK  
Development of striatal neurons and circuits
3. *Sonia Garel.* École Normale Supérieure, France  
Building the striatal mosaic: active intermixing of direct and indirect projection neurons
4. *Jens Hjerling-Leffler.* Karolinska Institutet, Sweden  
Development of neuronal transcriptional identity in the striatum

13:00 – 15:00 FREE TIME

**Monday, March 27 afternoon 15:00 - 18:00hs**

**Poster Session**

**18:00 - 20:00hs**

**Session III Neurophysiology and behavior in non human primates**

*Chair: Hugo Merchant.* Instituto de Neurobiología, UNAM, Mexico

1. *Okihide Hikosaka.* Chief, Section of Neuronal Networks, NEI/NIH, USA.  
Basal ganglia for attention
2. *Léon Tremblay.* Centre de Neurosciences Cognitives, Lyon University, France  
Dopamine and serotonin modulation in Basal Ganglia circuits involved in behavioral disorders: Evidence from human and non-human Primate
3. *Bruno B. Averbeck.* Laboratory of Neuropsychology, NIMH/NIH, USA  
Striatal neural circuitry underlying reinforcement learning
4. *Masaki Tanaka.* Department of Physiology, Hokkaido University, Japan  
Subcortical mechanism of self-timing
5. *Sonja A. Kotz.* Department of Neuropsychology and Psychopharmacology, Maastricht University, The Netherlands  
On the importance of timing and rhythm in motor and non-motor behavior

**Tuesday, March 28 morning 8:30 - 10:30hs**

**Session IV Basal Ganglia Circuits at the Center of Addiction**

Organizational level: from cellular to systems

*Chair: David M. Lovinger* NIH, USA

1. *Peter Kalivas.* Medical University of South Carolina, USA  
Synaptic plasticity in the ventral pallidum regulates drug relapse
2. *Bernard Balleine.* University of Sydney, Australia  
The involvement of dorsomedial striatum in behavioural control
3. *David M. Lovinger.* NIH, USA  
Alcohol Promotes Habitual Behavior Through Actions on the Cortico-Basal Ganglia Circuitry
4. *Kathleen Grant.* Oregon National Primate Research Center/OHSU, USA  
Cognitive flexibility and cortico-striatal connectivity in the rhesus monkey

OPTIONAL EXCURSIONS. Coming back at 18:00 hs



**Tuesday, March 28 evening 18:00 - 20:00hs**

### **Direct and indirect pathways: Friends or Foes**

A friendly conversation\* between **Rui Costa** (Champaullimaud, Ctr., Portugal) and **Anatole Kreitzer** (Gladstone, UCSF, USA) aiming to understand Basal Ganglia conceptual models more dynamically: what remains and what has to be changed about the **“Two pathways model”** (or **“rate model”**), of the Basal Ganglia after 27 years of being one of the most heuristic models of neuroscience?

*Moderator: D. J. Surmeier (Northwestern Univ., USA)*

1. *R Costa*

Basal Ganglia models: "Complementary not opposite roles for direct and indirect pathways in basal ganglia function" (20 min)

2. *A Kreitzer*

"Distinct roles for direct and indirect pathways in basal ganglia function" (20 min)

Questions addressed or guided by J. Surmeier (10 min)

3. *A Kreitzer Reply* (10 min)

4. *R Costa Reply* (10 min)

General discussion guided by J. Surmeier (20 min)

\*This conversation at the summit of the technological revolution in Basal Ganglia research substitutes the traditional **Key Note**

**Wednesday, March 29 morning 8:30 - 10:30hs**

### **Session V Revealing the Behavioral Functions of Basal Ganglia Circuits**

Organizational levels: from systems to behavior

*Chair: Joshua Berke. Univ of Michigan, USA*

1. *Kenji Doya. OIST, Japan*

Coding of action and state values in the striatal compartments

2. *Ann Graybiel. MIT, USA*

Steps toward identifying functions of the striosome-matrix organization of the striatum

3. *Mark Howe. Northwestern Univ., USA*

Heterogeneous dynamics of dopaminergic projection axons in striatum during behavior

4. *Joshua Berke. Univ of Michigan, USA*

Gaining a richer understanding of dopamine signals in adaptive decision-making

10:30 – 11:00 Coffee Break

**11:00 - 13:00hs**

**Session VI Striatal interneurons systems**

Organizational levels: from neurons/synapses to networks/systems

*Chair: James M. Tepper. Rutgers Univ., USA*

1. *J. M. Tepper. Rutgers U, USA*  
Introduction
2. *Maxime Assous. Rutgers University-Newark, USA*  
Differential processing of thalamic information via distinct striatal interneuron circuits
3. *Enrico Bracci. University of Sheffield, UK*  
In the striatal soup: tonic and phasic interactions of autonomously active interneurons
4. *Gilad Silberberg. Karolinska Institute, Sweden*  
Intrinsic and extrinsic inhibitory inputs to striatal cholinergic interneurons
5. *Charles Wilson. University of Texas, San Antonio, USA.*  
Striatal (P)LTS cells: Oscillations, resonance and persistent depolarized state

13:00 – 15:00 FREE TIME

**15:00 - 18:00hs**

**Poster Session**

**18:00 - 20:00hs**

**Session VII Cellular and functional heterogeneity of the external globus pallidus**

Organizational levels: from molecular to systems

*Chair: Mark Bevan. Northwestern Univ., USA*

1. *Fumino Fujiyama. Doshisha University, Japan*  
Using a novel PV-Cre rat model to characterize pallidonigral cells and their terminations
2. *Aryn Gittis. Carnegie Mellon Univ., USA*  
Cell-specific pallidal stimulation produces long-lasting recovery of movement in a bilateral dopamine depletion model



1. *Kim Avrama Blackwell*. G. Mason Univ., USA  
How do post-synaptic signaling molecules, activated by calcium and neuromodulators, contribute to striatal synaptic plasticity
2. *Jeanette Hällgren Kotaleski*. KTH, Stockholm, Sweden  
Reward learning - insights from subcellular level modeling
3. *Fred Hamker*. University Chemnitz, Germany  
Neuro-computational insights into basal ganglia pathway functions
4. *Rafal Bogacz*. Oxford Univ., UK.  
Learning reward uncertainty in the basal ganglia

13:00 – 15:00 FREE TIME

**15:00 - 17:00hs**

### **Session X Cholinergic modulation of striatal activity**

Organizational levels: from neurons to circuits

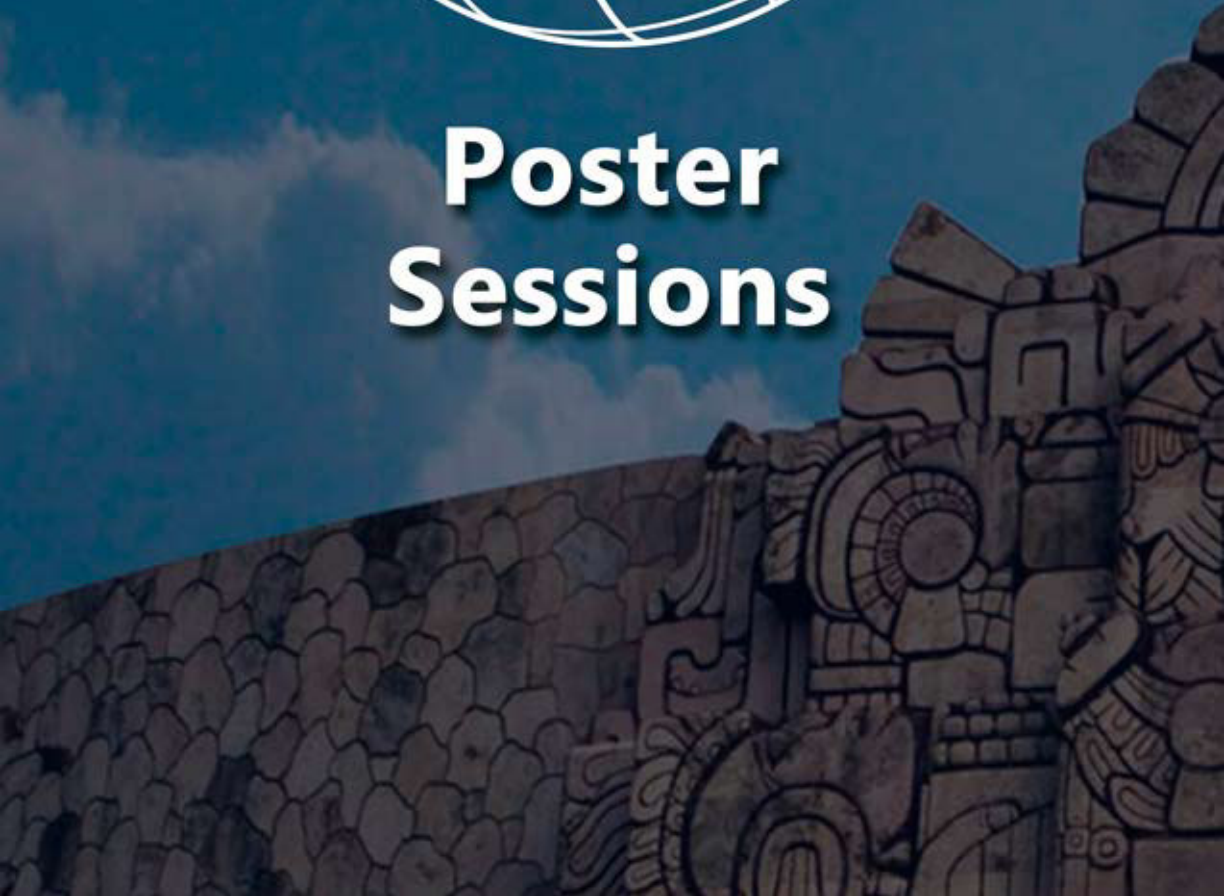
*Chair: Icnelia Huerta-Ocampo*. Rutgers University, USA

1. *Dorothy Oorschot*. University of Otago, New Zealand  
Synaptic connectome of midbrain dopaminergic neurons, striatal spiny projection neurons and striatal cholinergic interneurons in the rat
2. *Yanfeng Zhang*. Oxford, UK.  
The generation of pauses in striatal cholinergic interneurons
3. *Icnelia Huerta Ocampo*. Rutgers University, USA  
Brainstem cholinergic interactions with the thalamostriatal system
4. *Jeffrey Wickens*. Okinawa Institute of Science and Technology, Japan  
Role of striatal cholinergic interneurons in the cellular mechanisms of behavioral flexibility

**19:00 - 24:00hs Farewell Banquet. Hacienda Chenkú**



# **Poster Sessions**



## POSTERS SESSIONS

**Session I. Monday March 27. 15:00 – 18:00**

**Session II. Wednesday March 29. 15:00 – 18:00**

**All posters will be presented both days**

- 1** Partial Deletion of Cholinergic Interneurons from Dorsolateral Striatum and its Role in Behavioral Responses. *Nilupaer Abudukeyoumu, Yoko Nakano, Marianela García-Muñoz, Gordon W. Arbuthnott*
- 2** Reorganization of glutamatergic transmission to striatal cholinergic interneurons accounts for the reduction in their burst-pause response to thalamic stimulation after dopamine depletion. *Jose de Jesus Aceves Buendia, Wei-Hua Chiu, LiorTiroshi and Joshua A. Goldberg*
- 3** Neurovascular Uncoupling in the Dorsal Striatum: A Rodent Optogenetic-fMRI Study. *Daniel Albaugh, Brittany Katz, Nathalie van Den Berge, Chunxiu Yu, Warren Grill, Garret Stuber, Yen-Yu Ian Shih*
- 4** Representation of task relevant dimensions in dorsolateral striatum. *Flavia Aluisi, George Kour, Yael Zahar and Genela Morris*
- 5** Activity transients in nigral dopaminergic neurons gate and invigorate self-paced action initiation. *Joaquim Alves Da Silva, Fatuel Tecuapetla, Vítor B Paixão, Rui M Costa*
- 6** Direct and indirect pathways from caudate tail, together, guide saccadic eye movement to historically good objects. *Hidetoshi Amita, Hyoung F. Kim, Okihide Hikosaka*
- 7** Compartmental and Cellular Distribution of DARPP-32 in the Control Human Striatum. *C. J. Arasaratnam, H. J. Waldvogel, and R. L. M. Faull*
- 8** Effects of voluntary exercise on dopamine tissue content and BDNF expression in young and middle-aged mice. *Jennifer C. Arnold, Adam C. Mar, Moses V. Chao, Margaret E. Rice*
- 9** Astrocytic and mitochondrial dysfunction in the subthalamic nucleus in the Q175 knock-in model of Huntington's disease. *Jeremy F. Atherton, David Wokosin, D. James Surmeier, Mark D. Bevan*
- 10** D2 receptors on D2 MSNs and cholinergic interneurons modulate striatal endocannabinoid dependent long-term synaptic depression. *Shana M. Augustin and David M. Lovinger*

- 11** Muscarinic modulation of Ca<sup>2+</sup> channels in striatal projection neurons of Parkinsonian mice. *Avilés-Rosas Víctor H, Rendón-Ochoa Ernesto, Hernández-Flores Teresa and Bargas José*
- 12** Functionally classifying an ensemble of healthy and pathological basal ganglia network models. *Jyotika Bahuguna, Tom Tetzlaff, Arvind Kumar, Jeanette Hellgren Kotaleski, Abigail Morrison*
- 13** External circuit influences on neural computation in the striatum. *Konstantin I. Bakhurin, Kwang Lee, Leslie D. Claar, Vishwa Goudar, Dean V. Buonomano, Sotiris C. Masmanidis*
- 14** Model prediction: The STN-GPe loop enhances the selection of previous successful responses during exploration. *Javier Baladron and Fred Hamker*
- 15** Acute Tsc1 deletion alters intrinsic and synaptic excitability of striatonigral medium spiny neurons. *Katelyn Benthall*
- 16** Receptor studies suggest two neurochemically distinct populations of neurons in the human globus pallidus. *Brittney L Black, Henry J Waldvogel, Richard LM Faull*
- 17** The fate of striatal TH neurons in pre-symptomatic MPTP monkeys, Incidental Lewy Bodies and Parkinson's disease. *J. Blesa N, Lopez Gonzalez del Rey P., Garcia Esparcia, I, Trigo Damas Ferrer, C. Cavada, J. Obeso*
- 18** Dopamine D2 receptor mediated effects of stimulant drugs on food and water intake. *Miriam E. Bocarsly and Veronica A. Alvarez*
- 19** Firing patterns in substantia nigra pars reticulata neurons in vitro after dopamine blockade or deprivation in mouse. *Verónica Alejandra Cáceres Chávez, Ricardo Hernández Martínez, Jesús Pérez Ortega, Marco Arieli Herrera Valdez, Elvira Galarraga, José Bargas*
- 20** Aldehyde dehydrogenase 1-positive nigrostriatal dopaminergic fibers exhibit distinct projection pattern and dopamine release dynamics at dorsal striatum. *Carmelo Sgobio, Junbing Wu, Wang Zheng, Margaret I. Davis, David M. Lovinger, Huaibin Cai*
- 21** Changes in cortical phase amplitude coupling in a progressive model of primate parkinsonism. *M. Caiola, A. Devergnas, D. Pittard and T. Wichmann*
- 22** L-DOPA-Induced Dyskinesia in the mouse striatal microcircuit. *Vladimir Melecio Calderón Ortiz, Aldo Luna, María Fernanda Ramírez López, René Drucker Colín, José Bargas*
- 23** Abnormal STN-GPe network activity in the Q175 knock-in mouse model of Huntington's disease. *Joshua W. Callahan & Mark D. Bevan*

- 24** Abnormal information flow through the cortico-basal ganglia pathway in MPTP-treated parkinsonian monkeys. *Satomi Chiken, Atsushi Nambu*
- 25** NMDA receptor-dependent loss of cortico-subthalamic inputs following degeneration of midbrain dopamine neurons. *Hong-Yuan Chu, Eileen L. McIver, Jeremy F. Atherton, Mark D. Bevan*
- 26** Oscillations activity in subthalamic nucleus correlates with gait disturbance in PD. *Chiung Chu CHEN, Chien Hung YEH, Wey Yil LIN, Po Hsuen TU, Shih Tseng LEE, Chin Song LU*
- 27** Dysregulation of cortical synaptic input to central striatum in the Sapap3-KO OCD mouse model. *Victoria Corbit, Aryn Gittis, and Susanne Ahmari*
- 28** Differential Cholinergic Modulation of Striosomal and Matrix Striatal Neurons. *Jill R. Crittenden, Carolyn J. Lacey, Eddie Feng JuWeng, Yingxi Lin, Ann M. Graybiel*
- 29** Deletion of *Maged1* in mice abolishes locomotor and reinforcing effects of cocaine. Jean-François De Backer, Stéphanie Monlezun, Bérangère Detraux, Adeline Gazan, Giuseppe Cannazza, Sebastien Valverde, Olga Valverde, Philippe Faure, Michele Zoli, Olivier De Backer, David Gall, Serge N. Schiffmann, and *Alban de Kerchove d'Exaerde*
- 30** The subthalamic nucleus - the driving force of basal ganglia pathophysiology in parkinsonism. *Marc Deffains, Liliya Iskhakova, Shiran Katabi, Suzanne N. Haber, Zvi Israel & Hagai Bergman*
- 31** Thalamo-striatal contribution during the start and executions of an action sequences. *Edgar A. Díaz Hernández, Josue O. Ramírez Jarquín and Fatuel Tecuapetla Aguilar*
- 32** Dopaminergic modulation of Cholinergic communication in the Striatum. *Matthijs C. Dorst, Carolina B. Gonzales, Jens Hjerling-Leffler, and Gilad Silberberg*
- 33** PV+ interneurons function as hubs during striatal microcircuit dynamics. *Mariana Duhne, Ariadna Aparicio-Juárez, Esther Lara, Antonio Lavilleand José Bargas*
- 34** Distinct Firing Patterns of GPeArky pallidal and Prototypical Neurons in a Reinforcement Learning Task. *Michael A. Farries and Joshua D. Berke*
- 35** Behavioral Assessment of Gradual Dopamine Depletion in the Rat. *Heidi Y Febinger, Christine M Henry, and Alan Dorval*
- 36** Influence of reserpine-induced striatal dopamine depletion in adult rats upon modulation of corticostriatal transmission by A1 and A2A adenosine receptors. *Fernández-Fausto Ana Rosa, Álvarez Cervera Fernando José, Salgado Burgos Humberto, Góngora Alfaro José Luis*



- 37** Basal Ganglia: exploiting circuit gain and non-linear interactions for the generation of endophenotypes. *Vincenzo G. Fiore, Xiaosi Gu*
- 38** Reinforcement determines the timing dependence of corticostriatal synaptic plasticity in vivo. *Simon D Fisher, Paul B Robertson, Melony J Black, Peter Redgrave, Mark A Sagar, Wickliffe C Abraham, John N J Reynolds*
- 39** M<sub>4</sub> receptor activation normalizes dopaminergic signaling in Huntington's Disease (HD) mouse models. *Daniel J. Foster, Madigan L.Lavery, Jerri M. Rook, Mark S. Moehle, Zixiu Xiang, P. Jeffrey Conn*
- 40** Using a novel PV-Cre rat model to characterize pallidonigral cells and their terminations. *Fumino Fujiyama.*
- 41** Effects of optogenetic stimulation of thalamostriatal terminals in normal and parkinsonian monkeys. *Galvan A., Hu X., Smith Y., and Wichmann T.*
- 42** Tracts involved in the improvement of clinical outcome subsequent to ablative neurosurgery of the subthalamus in Parkinson's disease. *Maria Guadalupe García-Gomar, Francisco Velasco and Luis Concha*
- 43** Dendritic CaV3 channels distinguishes corticostriatal supratherms hold responses of direct and indirect pathways striatal projection neurons. *García-Vilchis B, Suárez Rodríguez P, Tapia D, Arias García MA, Serrano Reyes M, Bargas J and Galarraga E*
- 44** Encoding of behavioural choice in the prefrontal-striatal circuit: clues from multisite single unit recordings in a go no-go task in rats. *Christine Stubbendorff, Andrew MJ Young, Todor V Gerdjikov*
- 45** Characterization of striatal monoamine signaling and striatally-mediated motor and cognitive tasks in the DJ-1 KO rat model of Parkinson's disease. *Danielle M. Giangrosso, Teri M. Furlong, & Kristen A. Keefe*
- 46** L-DOPA treatment for methamphetamine-induced basal ganglia dysfunction. *Anne S. Gibson and Kristen A. Keefe*
- 47** Astrocytic mechanism controlling dopaminergic neuron activity. *Jorge Gomez*
- 48** Effect of chronic nicotine administration on levodopa induced dyskinesias in a rodent model of Parkinson's disease. *A. L. Gómez-Paz, M. Palomero-Rivero, D. Millán-Aldaco, M. Guerra-Crespo, R. Drucker-Colín*
- 49** Activation of medium spiny neurons by optogenetics induces dyskinesias in a Parkinson Disease model. *Hernandez LF, Castela I, Ruiz-DeDiego I, Obeso JA, Moratalla R.*

- 50** Preferential loss of cholinergic interneurons in the putamen of non-human primates in early manganese-induced parkinsonism. *KK Gonzales, J McGlothan, JS Schneider, TR Guilarte*
- 51** The chemogenetic suppression of the primate STN induces abnormal involuntary movement. *Taku Hasegawa, Chiken Satomi, Kenta Kobayashi, Atsushi Nambu*
- 52** How do cortico-striatal projections impact on downstream basal ganglia circuitry?. *Sarah R. Heilbronner, Mariah A.A. Meyer, & Suzanne N. Haber*
- 53** Nicotine modifies inhibitory synapses in the striatum in a Parkinsonian mouse model. *Fabiola Hernández Vázquez, Jesús Pérez-Ortega, Elvira Galarraga, René Drucker-Colín and José Bargas*
- 54** Clorogenic acid as a neuroprotector in striatal neurodegeneration. *Alam Hernández-González, Elibeth Monroy, Rubén Antonio Vázquez Roque, Ernesto Mendoza, Gonzalo Flores, Elizabeth Hernández Echeagaray*
- 55** Correlated Neuronal Activity in the Mouse Motor Cortex. *Teresa Hernández Flores, Omar Jáidar, Yoko Nakano, Mariana García Muñoz, Gordon W. Arbutnott*
- 56** A novel role for the eIF2a translational control pathway in dystonia: implications in cortico striatal synaptic plasticity. *Ricardo Hernández Martínez, Joseph E Rittiner, Zachary F. Caffall, Miranda K. Shipman, and Nicole Calakos*
- 57** Personality changes following left subthalamic nucleus infarct: A case report. *Herrera Díaz Pamela Montserrat, Seubert Ravelo Ana Natalia, Salgado Ceballos Hermelinda, Morales Briceño Hugo*
- 58** Preferential Role of the Subthalamic Nucleus in Approach-Avoidance Decision Making. *Herrington Todd M., Patel Shaun R., Kanoff Kristen E., Tsai Sheng-Tzung, Widge Alik S., Dougherty Darin D., Eskandar Emad N*
- 59** Anatomical location and connectivity of effective STN stimulation for Parkinson's Disease. *Andreas Horn, Johannes Vorwerk, Ningfei Li, Tanja Schmitz-Hübsch, Andrea A. Kühn, Michael Fox*
- 60** Impairment of macroautophagy enhances dopamine neurotransmission and rescues motor deficits despite worsened neuropathology in a mouse model of Parkinson's disease. *Benjamin H.M. Hunn, Sarah Threlfell, Javier Alegre Abarrategui, Thierry Delteil, Nora Bengoa Vergniory, Peter L. Oliver, Milena Cioroch, Natalie Doig, David M. Bannerman, Stephanie J. Cragg, and Richard Wade-Martins*
- 61** Somatotopic organizations of motor cortical inputs to the subthalamic nucleus and globus pallidus of monkeys. *Hirokazu Iwamuro, Yoshihisa Tachibana, Yoshikazu Ugawa, Nobuhito Saito, Atsushi Nambu*

- 62** Synaptic properties of cortical and thalamic projections onto different types of striatal neurons. *Yvonne Johansson & Gilad Silberberg*
- 63** Chronic alcohol exposure impairs metabotropic glutamate receptor 2-mediated long-term depression of excitatory transmission in the dorsal striatum. *Kari A. Johnson, Yolanda Mateo, and David M. Lovinger*
- 64** Neuronal activity in the primate caudate nucleus during the prediction of periodic visual stimuli. *Masashi Kameda, Masaki Tanaka*
- 65** Differential Single Unit Responses to Reward and Aversion in the Primate Ventral Pallidum. *Alexander Kaplan, Aviv D. Mizrahi Kliger, Zvi Israel, Hagai Bergman*
- 66** Sensory responses in subtypes of Globus Pallidus neurons. *Maya Ketzev & Gilad Silberberg*
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