

Sandrine Betuing, PhD

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Research Lab :

Sorbonne University
Neuroscience Paris Seine
Institut de Biologie Paris Seine,
UMRs84246/INSERM
Team : "Neuronal Signaling and Gene Regulation"

Education

2014 : French accreditation to supervise research (HDR), Sorbonne University, France.

1998 : PhD in Molecular and Cellular Pharmacology, with honors University Paul Sabatier, Toulouse, France

Positions and Honors

Positions and Employment :

Since 2020 : Director of the Research and Education Unit for Life Science, Sorbonne Université, Paris

Since 2018 : Full Professor Sorbonne Université, Neuroscience Paris Seine Unit, CNRS, Paris, France

2018-2020 : Co-president of the teaching council of the Research and Education Unit for Life Science, Sorbonne Université

2017-2018 : Assistant Professor "Hors Normale", Sorbonne Université, Paris, France

2011-2018 : Assistant Professor "Classe Normale", Sorbonne Université, Paris, France

2000-2011 : Assistant Professor "Classe Normale" Université Evry Val d'Essonne, Evry, France

1998-2000 : Post doctoral position, Harvard Medical School, Beth Israel Deaconess Center, Boston USA

1995-1998 : PhD student, INSERM , Université Toulouse , France

Other Experience and Professional Memberships

-Regular review for international Journals (Mol Neurodegeneration, Neurobiol Dis, Neurotherapeutics, J. Comp Neurol, Frontiers in Neurosci, Biochem J, Brain Comm)

-Regular grant reviewer (AFM-telethon, Idex, ANR, MRC)

-Regular jury member (PhD committees, Master of Molecular and Cellular Biology and Master of Neuroscience, Sorbonne Université, Paris)

-Regular teaching activity (lectures and tutorials, Masters of Neurosciences, Sorbonne Université, Paris)

-Regularly invited to give seminars and presentations at international meetings (around 20 invitations since 2012)

-Co-organizer of the symposium on "Cholesterol and neurodegenerative disease" Society of Mediterranean Neuroscience, Marrakech, Marroco (2019)

-Organizer of a summer School for Chinese Students dedicated to Research training in Molecular and Cellular Biology, Sorbonne Université, Paris (2018)

-Member of the review editorial board of Frontiers in Neuroscience since 2020

-Member of the scientific committee of the Association Huntington France (AHF) since 2017

-Consultancies for "Brain Vectis" Start-up (2016-2018)

-Member of the National University Committee (since 2019)

Honors :

1995-1998 : Doctoral fellowship from Minister of Education and Research

1998-1999 : Post-doctoral Fellowship from "French association for therapeutical Research", France

Scientific productions- Main publications , Patent and Licence

28 publications, h Index 19, >1700 citations

-Kacher R, Mounier C, Caboche J and **Betuing S** "Altered Cholesterol Homeostasis in Huntington Disease", Frontiers in Neuroscience Aging, in press

-Andrianarivelo A, Saint-Jour E, Pousinha P, Fernandez SP, Petitbon A, De Smedt-Peyrusse V, Heck N, Ortiz V, Allichon MC, Kappès V, **Betuing S**, Walle R, Zhu Y, Joséphine C, Bemelmans AP, Turecki G, Mechawar N, Javitch JA, Caboche J, Trifilieff P, Barik J, Vanhoutte P. "Disrupting D1-NMDA or D2-NMDA receptor heteromerization prevents cocaine's rewarding effects but preserves natural reward processing". Sci Adv. (2021) Oct 22;7(43):eabg5970. doi: 10.1126/sciadv.abg5970

-Aït Amiri S, Deboux C, Soualmia F, Chaaya N, Louet M, Duplus E, **Betuing S**, Nait Oumesmar B, Masurier N, El Amri C. Identification of First-in-Class Inhibitors of Kallikrein-Related Peptidase 6 That Promote Oligodendrocyte Differentiation. J Med Chem. 2021 May 13;64(9):5667-5688. doi: 10.1021/acs.jmedchem.0c02175. Epub 2021 May 5.

-Nóbrega C, Conceição A, Costa RG, Koppenol R, Sequeira RL, Nunes R, Carmo-Silva S, Marcelo A, Matos CA, **Betuing S**, Caboche J, Cartier N, Alves S. The cholesterol 24-hydroxylase activates autophagy and decreases mutant huntingtin build-up in a neuroblastoma culture model of Huntington's disease. BMC Res Notes. 2020 Apr 10;13(1):210. doi: 10.1186/s13104-020-05053-x.

Caboche J, Kacher R, **Betuing S**. [Regulation of cholesterol metabolism is neuroprotective in Huntington's disease]. *Med Sci (Paris)*. 2020 Jan;36(1):12-15. doi: 10.1051/medsci/2019253. Epub 2020 Feb 4. French.

-Kacher R, Lamazière A, Heck N, Kappes V, Mounier C, Despres G, Dembitskaya Y, Perrin E, Christaller W, Sasidharan Nair S, Messent V, Cartier N, Vanhoutte P, Venance L, Saudou F, Néri C, Caboche J, **Betuing S**. (2019) CYP46A1 gene therapy deciphers the role of brain cholesterol metabolism in Huntington's Disease. *Brain*. 2019 Aug 1;142(8):2432-2450. doi: 10.1093/brain/awz174..

-Boussicault L, Kacher R, Lamazière A, Vanhoutte P, Caboche J, **Betuing S***, Potier MC. CYP46A1 protects against NMDA-mediated excitotoxicity in Huntington's disease: Analysis of lipid raft content. *Biochimie* (2018) Aug 11. *corresponding auteur

-Dos Santos M, Salery M, Forget B, **Betuing S**, Garcia Perez MA, Boudier T, Vanhoutte P, Caboche J and Heck N. Rapid synaptogenesis in the Nucleus Accumbens is induced by a single cocaine administration and stabilized by MAP Kinase interacting-kinase1 activity. *Biological Psychiatry* (2017) Mar. S0006-3223(17)31403-8.

-Galan-Rodriguez B, Martin E, Brouillet E, Déglon N, **Betuing S**, Caboche J. "Coupling of d2R short but not d2R Long receptor isoform to the Rho/Rock signaling pathway renders striatal neurons vulnerable to mutant huntingtin". *Eur J Neurosci*. (2017) Jan;45(1):198-206

-Boussicault L, Alves S, Lamazière A, Planques A, Heck N, Moumné L, Despres G, Bolte S, Hu A, Pagès C, Galvan L, Piguet F, Aubourg P, Cartier N, Caboche J and **Betuing S**. "Cyp46-A1, the rate-limiting enzyme for cholesterol degradation, is neuroprotective in Huntington's disease." *Brain* (2016) Mar;139(Pt 3):953-70.

-Moumné L, **Betuing S** and Caboche J. "Multiple aspects of gene dysregulation in Huntington's disease: from epigenetic to post-transcriptional events." *Front Neurol*. (2013) 4:127

-Heck N, **Betuing S**, Vanhoutte P, Caboche J. "A deconvolution method to improve automated 3D-analysis of dendritic spines: application to a mouse model of Huntington's disease." *Brain Struct Funct*. (2012) 217:421-434

-Martin E, **Betuing S**, Pages C, Cambon K, Auregan G, Deglon N, Roze E, Caboche J. "Mitogen- and stress-activated protein kinase 1-induced neuroprotection in Huntington's disease: role of chromatin remodeling at the PGC-1-alpha promoter." *Hum. Mol. Genet*. (2011) 20:2422-2434

-Roze E, Cahill E, Martin E, Bonnet C, Vanhoutte P, **Betuing S**, Caboche J. "Huntington's disease and striatal signaling." *Front Neuroanat*. (2011) 5:55

-Roze E, Bonnet C, **Betuing S**, Caboche J. "Huntington's Disease" *Adv Exp Med Biol*. (2010) 685:45-63

-Deyts C, Martin E, Bouveyron N, Roze E, Charvin D, Caboche J, **Bétuing S**. "D2 receptor potentiates PolyQ-Huntingtin induced neuritic retraction, aggregate formation and neuronal death via Rho/ROCK-II activation." *PLoS One*. (2009) 4:e8287

-Roze E, **Betuing S**, Deyts C, Vidailhet M, Caboche J. "Pathophysiology of Huntington's disease : an update." *Rev Neurol*. (2008) 164:977-994

-Roze E, **Betuing S**, Deyts C, Marcon E, Brami-Cherrier K, Pagès C, Humbert S, Mérienne K, Caboche J. "Mitogen- and stress-activated protein kinase-1 deficiency is involved in expanded-huntingtin-induced transcriptional dysregulation and striatal death." *FASEB J*. (2008) 22:1083-1093

-Charvin D, Roze E, Perrin V, Deyts C, **Betuing S**, Pagès C, Régulier E, Luthi-Carter R, Brouillet E, Déglon N, Caboche J. "Haloperidol protects striatal neurons from dysfunction induced by mutated huntingtin *in vivo*." *Neurobiology of Disease*, (2008) 29:22-29

Patent and Licence

2016 - Licence to BrainVectis Start-Up (WO2011/068033)

2011- Patent (WO2011/068033) World extension: "Methods and pharmaceutical composition for the treatment of Huntington's disease"

Inventors : Aubourg P, Bétuing S, Caboche J et Cartier N.

Research Support (last 10 years)

2021-2023 : Neuratris "Innovative and collaborative neurodegenerative disease projects" - 98 K€, PI

2020-2024 : ANR (Agence Nationale de la Recherche) *STERO-HD (CE16)* : 511 k€, PI

2020-2023 : AFM-Téléthon (Association Française contre les myopathies) (#22986) 85k€, PI

2017-2018 : European Huntington's disease Network Seed funds (EHDN) (#867) 35K€, PI

2017-2018 : AFM-Téléthon (Association Française contre les myopathies) (#20763)20k€, PI

2015-2018: Fondation Groupama pour la santé 97 K€ -(PhD fellowship), PI

2013-2015 : DIM Biothérapies Région Ile de France (Post-doctoral fellowship), PI

2011-2016 : Chaire excellence INSERM/UPMC 50k€, PI