

Section 27 : Neurobiologie moléculaire et cellulaire, neurophysiologie Collège A2

Sylvia Soares

UMR8263 – Développement Adaptation & Vieillesse – Paris

Curriculum vitae

Position

Professeure d'Université- Sorbonne Univ – Faculté des Sciences – Dev2AQ/IBPS - CNRS UMR8263 INSERM U1345— Equipe Adaptation Neurale et Vieillesse – 7-9 quai St Bernard, Paris- France.

Personal Statement

I have been recruited as associated professor in Neuroscience in 2005 and promoted professor in 2022. My research is based on understanding the molecular and cellular mechanisms underlying axon regeneration and degeneration, that at certain point, recapitulate developmental stages of mammals. At the fundamental level, my work is focused on the interaction of cytoskeleton with intracellular traffic in response to a chemical and physical environment that prevent axons to regrow to their appropriate target. Simultaneously, I have developed an expertise in the pathophysiology of the spinal cord trauma and in experimental animal models. Accordingly, I am also involved in developing biomaterial-based tissue engineering for spinal cord trauma repair with multidisciplinary collaborators (physics, chemists and clinicians). This translational project has been promoted with appropriate fundings towards technology transfer.

Education

HDR, Université Pierre & Marie Curie (2016)

PhD - Université Pierre & Marie Curie – Paris – Neuroscience (2000)

Master - Université Pierre & Marie Curie – Paris – Physiologie, Biologie Cellulaire & Neuroscience (1996)

Professional Positions

2022- Professeur des Universités- Neuroscience- Sorbonne Université – Paris

2018 – Maître de Conférence Hors classe – Neuroscience- Sorbonne Université – Paris

2005 – Maître de Conférence Classe Normale – Neuroscience – UPMC - Paris

2004 – Attaché temporaire en enseignement et en recherche – Neuroscience – UPMC - Paris

2002 – Post-doc : -Lab Neurobiologie des Signaux intracellulaires CNRS/UPMC - Paris

2000– Post-doc : Lab Neuromorphologie, développement et évolution/INSERM/Pitié Salpêtrière/Paris.

Neuroscience expertise key words

Axon outgrowth/regeneration, morpho-functional plasticity, CNS and PNS experimental models for traumatic lesions, neurodegeneration, regeneration, repair (stem and neural cell transplantation; biomaterial scaffolds, drug-treatment), glial reactions, Schwann cells, demyelination/remyelination, rodent animal experimental models, cell biology and imaging, neurite branching and guidance, ECM, adhesion, signaling pathways, cytoskeleton reorganization, stem cells, physical constraints, mitochondria, traffic.

PhD Research Advisor

5 PhD students (3 graduated)

Recent institutional activities and other expertise

Elected Member CoCNRS – section 25 and CID 50 in 2021

Responsible of teaching units at Sorbonne Université (Master and Medical School) since 2008

Responsible of Neuroscience division at SU since 2020

Member of teaching councils at SU since 2009

Member of “comité bien-être animal” of IBPS institute and animal facility since 2015

Member of jury of PhD and HDR

Member of the lab council 2014-2024

Member of the institute council since 2025 (substitute)

Jury committee member for technician and ingeneer recrutement (ITRF) since 2012

Expert for national grant agencies, for scientific journals : regularly requested for manuscript review.

Expert for European Marie Skłodowska Curie post-doc grant review since 2022

Patent

F. Nothias*, S. Soares*, L. David*, A. Montembault* (2014) Hydrogel de chitosane pour la réparation du tissu nerveux. n° WO2014013188 A1.

F. Nothias, Y vonBoxberg, S. Soares (2021) "Method for screening immunomodulatory biomaterials". PCT/FR2021/051692.

Technology transfer

MedJeduse (created in March 2019) co-founded with F. Nothias & Y vBoxberg for medical devices development for CNS repair.

Selected publications for an overview on neuroscience expertise

-Williams, Schelbaum, Ahmanna, Alexander, Kante, **Soares**, Sharif, Nothias, Martin (2024). "Combined biomaterial scaffold and neuromodulation strategy to promote tissue repair and corticospinal connectivity after spinal cord injury in a rodent model." *Exp Neurol* 382: 114965.

-Beliard, Ahmanna, Tiran, Kante, Deffieux, Tanter, Nothias, **Soares #**, Pezet # (2022). Ultrafast Doppler imaging and Ultrasound Localization Microscopy reveal the complexity of vascular rearrangement in chronic spinal lesion. *Scientific Reports* 12:6574. # corresp author.

-von Boxberg, **Soares**, Giraudon, David, Viallon, Montembault, Nothias (2021) Macrophage polarization in vitro and in vivo modified by contact with fragmented chitosan hydrogel. *J Biomed Mater Res.* 1-15.

-Izmiryan, Li, Nothias, Eyer, Paulin, **Soares #**, Xue # (2021) Inactivation of vimentin in satellite glial cells affects dorsal root ganglion intermediate filament expression and neuronal axon growth *in vitro*. *Molecular and Cellular Neuroscience* 115, 10359. # corresp author.

-Gautier, Hajjar, **Soares**, Berthelot, Deck, Abbou, Campbell, Ceprian-Costoso, Gonzalez, Fovet, Schütza, Jouvenel, Rivat, Zerah, Le Ravazet, Le Guiner, Aubourg, Fledrich, Tricaud (2021) AAV2/9-mediated silencing of PMP22 prevents CMT1A disease in rats and validates human skin biomarkers as treatment outcome measure. *Nature Communications.* (12) 2356.

- Soares, vonBoxberg, Nothias (2020) Repair strategies for traumatic spinal cord injury; advance in bioengineering-based preclinical approaches. Review in *Revue Neurologique* 176 (4) 252-260.

- Tian Hu, Xie, Mei, Pham, Mo, Hepp, **Soares**, Nothias, Wang, Liu, Cai, Zhong, Li, Yao (2019) Recovery from tachyphylaxis of TRPV1 coincides with recycling to the surface membrane. *PNAS.* 116(11):5170-5175.

- Cantaut-Belarif, Antri, Vaccari, Pizzarelli, Colasse, **Soares**, Renner, Dallel, Triller, Bessis (2017) Microglia differentially control the glycinergic and GABAergic synapses via a prostaglandin E2-dependent mechanism. *J Cell Biol.* 216:2979.

- Chedly, **Soares**, Clayer-Montembault, vonBoxberg, Veron-Ravaille, Nothias (2017) Physical chitosan microhydrogels as scaffolds for spinal cord injury restoration and axon regeneration *Biomaterials* 138:91-107.

- Barnat, Benassy, Vincensini, **Soares**, Fassier, Propst, Andrieux, vonBoxberg, Nothias (2016) The GSK3-MAP1B pathway controls neurite branching and microtubule dynamics. *Mol Cell Neurosci.* 72:9-21

- Milbreta, vonBoxberg, Mailly, Nothias, **Soares** (2014) Astrocytic and vascular remodeling in the injured adult rat spinal cord after chondroitinase ABC treatment. *J Neurotrauma*, 31:803-18

- vonBoxberg, **Soares**, Féreol, Fodil, Bartolami, Taxi, tricaud, Nothias (2014) Giant scaffolding protein AHNK1 controls motility and mechanical properties of Schwann cells. *Glia* 62:1392-1406.

- Barnat, Enslin, Propst, Davis, **Soares**, Nothias (2010) Distinct roles of JNK isoforms in neurite initiation and elongation during axonal regeneration, *J Neurosci*, 30(23):7804-16.

- Parras Galli, Britz, **Soares**, Galichet, Battiste, Johnson, Nakafuku, Vescovi, Guillemot (2004) Mash1 specifies neurons and oligodendrocytes in the postnatal brain. *EMBO J.* 23 : 4495-4505.