

Anne-Cécile BOULAY

PERSONAL INFORMATION

Birth date : 1986 Septembre 24th
No children

CONTACT

Team « physiology et physiopathology of the gliovascular unit »
CIRB, Collège de France, 11 place Marcelin Berthelot, 75005 Paris-
France
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PRESENT PROFESSIONAL SITUATION

Permanent Associate Researcher (CRCN), Inserm, France

CIRB, Collège de France, Team « physiology et physiopathology of the gliovascular unit », Dr. M. Cohen-Salmon

EDUCATION

- 2021 **HDR (Habilitation to supervise PhD students), Sorbonne University, Paris**
- 2015 **PhD, Pierre et Marie Curie University, Paris**
- 2011 **Master in Biosciences, ENS de Lyon, Claude Bernard university, Lyon**

PROFESSIONAL EXPERIENCE

- 2018-2020 Postdoctoral Fellow: CIRB, Collège de France, Paris. Team « physiology et physiopathology of the gliovascular unit », Dr. M. Cohen-Salmon
- 2016-2018 Postdoctoral Fellow: Inserm U1144, Paris Descartes University, Paris. Team « physiology and therapy of the Blood-brain Barrier », Pr. X. Declèves
- 2015 Teaching assistant (ATER): Inserm U1144, Paris Descartes University, Paris. Team « physiology and therapy of the Blood-brain Barrier », Pr. X. Declèves
- 2011-2015 PhD student, under the direction of Dr. M. Cohen-Salmon. CIRB, Collège de France, Paris, Pr. A. Prochiantz,

HONORS AND AWARDS

- 2022 **PSL « young fellows » (150 000 €, 3 years, PI)**
- 2020 Villejuif's Talent award
- 2019 **For Women In Science l'Oréal/Unesco Post-doctoral award (20 000 €, 2 years)**
- 2018 Best oral presentation award (French Glial cell club meeting, Paris)
- 2016 Best oral presentation award (SEISC meeting, Lyon)
- 2016-18 Post doctoral fellowship, (Fondation pour la Recherche Médicale, 2 years)
- 2015-16 Full-time teaching assistant position in cellular biology (Paris Descartes university, 1 year)
- 2014-15 4th year PhD fellowship (Labex Memolife 1 year)
- 2011-14 PhD fellowship (ENS de Lyon, 3 years)
- 2007-11 Undergraduate/Master fellowship (élève normalienne, ENS de Lyon, 4 years)

CONTRIBUTION TO THE SCIENTIFIC COMMUNITY

Member of the French Glial cell club board (2021-present)

Peer-review activity: Journal of Visualized Experiment, Science Advances, Italian telethon

Science administration: Part-time mission at the european grant office (Pierre et Marie Curie University) (2011-2013), Full-time internship at the scientific department of the French embassy in Norway (6 months, 2009)

SUPERVISION/TEACHING

PhD/PharmD evaluation: 1 PhD jury (2019), 2 PharmD Jurys (2018, 2019) and 2 PhD committees

Student Supervision: 1 PhD student (2020-present), 4 master students, 2 bachelor students

Teaching activity: Master 2 (Lille University) (6h, 2015), PACES (90h, 2015-2016)

SCIENCE OUTREACH

Presentation in highschool

- 2019 Participation to round-tables at Charles de Foucauld highschool (Paris) as part of "Declic" events organised by FSER (Fondation Schlumberger pour l'Education et la Recherche)
- 2017 Participation to round-tables at Marcelin Berthelot highschool (Pantin) as part of "Declic" events organised by FSER (Fondation Schlumberger pour l'Education et la Recherche)
- 2016 « Des étoiles plein la tête », intervention about research in neuroscience (preparatory class, Albert Châtelet highschool, Douai)
- 2013, 2014 « Le système de l'enseignement supérieur et de la recherche en France », intervention about the higher education system and research carriers (Berlioz highschool, Vincennes)

Presence in non-specialized media (in french)

- 2020 Inserm, le magazine n°47 p27, Juillet 2020 (Journalist : Françoise Dupuy Maury)
- 2019 Magazine "Villejuif Notre ville", Numéro 243 p15, Octobre 2019, (journalist : Alexandre Pech)
Magazine du département Indre-et-Loire (journalist : Anais Bechu)
Journal « la Nouvelle République », (journalist : Julien Proult)
Radio RCF Saint Martin (journalist : Valentin Bonjean)
« Edith mag », Numéro 47 p2, Novembre 2019

SCIENTIFIC PRODUCTION

Invited seminars: 4 invited seminars, by Dr. A. Sharif, (Lille Inserm U1172, 2016), Dr.C. Escartin, (Institut de biologie François Jacob, 2019), CIRB (2021), Dr. C. Duplaa, (Bordeaux, Inserm U1034, 2022)

Oral presentations in congress: French glial cell club (annual meeting 2018), French society for the study of brain interfaces (SEISC) (annual meetings 2014, 2015, 2016, 2018), International Astromeeeting, (Paris, 2014)

Research articles

2022

- 1) PAI-1 production by reactive astrocytes drives tissue dysfibrinolysis in multiple sclerosis models
Lebas H, Guérit S, Picot A, **Boulay AC**, Fournier A, Vivien D, Cohen Salmon M, Docagne F, Bardou I.
Cell Mol Life Sci. 2022 May 28;79(6):323. doi: 10.1007/s00018-022-04340-z. PMID: 35633384

2021

- 2) CC17 Group B Streptococcus exploits integrins for meningitis development
Deshayes de Cambrene R, Fouet A, Picart A, Bourrel AS, Anjou C, Bouvier G, Candeias C, Bouaboud A, Costa L, **Boulay AC**, Cohen-Salmon M, Plu I, Rambaud C, Faurobert E, Albigès-Rizo C, Tazi A, Poyart C, Guignot J.
J Clin Invest 2021, 131 (5). PMID: 33465054
- 3) Megalencephalic leukoencephalopathy with subcortical cysts is a developmental disorder of the gliovascular unit.
Gilbert A, Elorza-Vidal X, Rancillac A, Chagnot A, Yetim M, Hingot V, Deffieux T, **Boulay AC**, Alvear-Perez R, Cisternino S, Martin S, Taib S, Gelot A, Mignon V, Favier M, Brunet I, Declèves X, Tanter M, Estevez R, Vivien D, Saubamea B, Cohen-Salmon M
Elife (2021) 1010.7554/eLife.71379. PMID: 34723793
- 4) In mice and humans, the brain's blood vessels mature postnatally to acquire barrier and contractile properties PREPRINT
Slaoui L, Gilbert A, Federici L, Rancillac A, Gelot A, Favier M, Robil N, Letort G, Dias K, Jourden L, Maily P, Auvity S, Cisternino S, Cohen-Salmon M and **Boulay AC**
Biorxiv. 2021.05.17.444486

2020

- 5) Immunoprecipitation of Ribosome-Bound mRNAs from Astrocytic Perisynaptic Processes of the Mouse Hippocampus.
Mazaré N, Oudart M, Cheung G, **Boulay AC**, Cohen-Salmon M.
STAR Protoc. 2020 Dec 4;1(3):100198. doi: 10.1016/j.xpro.2020.100198. eCollection 2020 Dec 18. PMID: 33377092 Free PMC article. PMID: 33377092
- 6) Dp71 contribution to the molecular scaffold anchoring aquaporine-4 channels in brain macroglial cells.
Belmaati Cherkaoui M, Vacca O, Izabelle C, **Boulay AC**, Boulogne C, Gillet C, Barnier JV, Rendon A, Cohen-Salmon M, Vaillend C.
Glia. 2020 Nov 28. doi: 10.1002/glia.23941. Online ahead of print. PMID: 33247858
- 7) Astroglial Connexin 43 Deficiency Protects against LPS-Induced Neuroinflammation: A TSPO Brain μ PET Study with [18F]FEPPA.
Vignal N, **Boulay AC**, San C, Cohen-Salmon M, Rizzo-Padoin N, Sarda-Mantel L, Declèves X, Cisternino S, Hosten B.
Cells. 2020 Feb 7;9(2):389. doi: 10.3390/cells9020389. PMID: 32046185 Free PMC article.
- 8) Local Translation in Perisynaptic Astrocytic Processes Is Specific and Changes after Fear Conditioning
Mazaré N., Oudart M., Moulard J., Cheung G., Tortuyaux R., Maily P., Mazaud D., Bemelmans AP, **Boulay AC**, Blugeon C., Jourden L., Le Crom S., Rouach N. and Cohen-Salmon M.
Cell Rep. 2020 Aug 25;32(8):108076. doi: 10.1016/j.celrep.2020.108076. PMID: 32846133

- 9) AstroDot: a new method for studying the spatial distribution of mRNA in astrocytes
Oudart M., Tortuyaux R., Mailly P., Mazaré N., **Boulay AC.** and Cohen-Salmon M.
J Cell Sci . 2020 Apr 8;133(7):jcs239756. doi: 10.1242/jcs.239756. PMID: 32079659
- 2019
- 10) Postnatal development of the astrocyte perivascular MLC1/GlialCAM complex defines a temporal window for the gliovascular unit maturation
Gilbert A., Elorza Vidal X., Estevez R., Cohen-Salmon M. and **Boulay AC.**
Brain Struct Funct. 2019 Jan 25. doi: 10.1007/s00429-019-01832-w. PMID:30684007
- 11) Preparing the astrocyte perivascular endfeet transcriptome to investigate astrocyte molecular regulations at the brain vascular interface
Boulay AC., Mazaré N., Saubaméa B. and Cohen-Salmon M
In Methods Mol Biol. 2019;1938:105-116. doi: 10.1007/978-1-4939-9068-9_8. PMID: 30617976
- 2012-2018
- 12) Connexin 43 Controls the Astrocyte Immunoregulatory Phenotype.
Boulay AC, Gilbert A, Oliveira Moreira V, Blugeon C, Perrin S, Pouch J, Le Crom S, Ducos B, Cohen-Salmon M.
Brain Sci. 2018 Mar 22;8(4). pii: E50. doi: 10.3390/brainsci8040050. PMID: 29565275
- 13) Isolation and differential transcriptome of vascular smooth muscle cells and mid-capillary pericytes from the rat brain.
Chasseigneaux S, Moraca Y, Cochois-Guégan V, **Boulay AC,** Gilbert A, Le Crom S, Blugeon C, Firmo C, Cisternino S, Laplanche JL, Curis E, Declèves X, Saubaméa B.
Sci Rep. 2018 Aug 16;8(1):12272. doi: 10.1038/s41598-018-30739-5. PMID: 30116021
- 14) Connexin 30 is expressed in a subtype of mouse brain pericytes.
Mazaré N, Gilbert A, **Boulay AC,** Rouach N, Cohen-Salmon M.
Brain Struct Funct. 2018 Mar;223(2):1017-1024. doi: 10.1007/s00429-017-1562-4. Epub 2017 Nov 16. PMID: 29143947
- 15) Translation in astrocyte distal processes sets molecular heterogeneity at the gliovascular interface.
Boulay AC, Saubaméa B, Adam N, Chasseigneaux S, Mazaré N, Gilbert A, Bahin M, Bastianelli L, Blugeon C, Perrin S, Pouch J, Ducos B, Le Crom S, Genovesio A, Chrétien F, Declèves X, Laplanche JL, Cohen-Salmon M.
Cell Discov. 2017 Mar 28;3:17005. doi: 10.1038/celldisc.2017.5. eCollection 2017. PMID: 28377822
- 16) Purification of Mouse Brain Vessels.
Boulay AC, Saubaméa B, Declèves X, Cohen-Salmon M.
J Vis Exp. 2015 Nov 10;(105):e53208. doi: 10.3791/53208. PMID: 26574794
- 17) Immune quiescence of the brain is set by astroglial connexin 43.
Boulay AC, Mazeraud A, Cisternino S, Saubaméa B, Mailly P, Jourden L, Blugeon C, Mignon V, Smirnova M, Cavallo A, Ezan P, Avé P, Dingli F, Loew D, Vieira P, Chrétien F, Cohen-Salmon M.
J Neurosci. 2015 Mar 11;35(10):4427-39. doi: 10.1523/JNEUROSCI.2575-14.2015. PMID: 25762685
- 18) The Sarcoglycan complex is expressed in the cerebrovascular system and is specifically regulated by astroglial Cx30 channels.
Boulay AC, Saubaméa B, Cisternino S, Mignon V, Mazeraud A, Jourden L, Blugeon C, Cohen-Salmon M.
Front Cell Neurosci. 2015 Feb 2;9:9. doi: 10.3389/fncel.2015.00009. eCollection 2015. PMID: 25698924
- 19) Hearing is normal without Connexin 30.
Boulay AC, del Castillo F, Giraudet F, Hamard G, Giaume C, Petit C, Avan P, Martine Cohen-Salmon.
J. Neurosci. 2013 Jan 9;33(2):430-4. doi: 10.1523/JNEUROSCI.4240-12.2013. PMID: 23303923
- 20) Bmcc1s interacts with the phosphate-activated glutaminase in the brain.
Boulay AC, Burbassi S, Lorenzo HK, Loew D, Ezan P, Giaume C, Cohen-Salmon M.
Biochimie 2013 Apr;95(4):799-807. doi: 10.1016/j.biochi.2012.11.016. Epub 2012 Dec 12. PMID: 23246912
- 21) Deletion of astroglial connexins weakens the blood-brain barrier.
Ezan P, André P, Cisternino S, Saubaméa B, **Boulay AC,** Dautremer S, Thomas MA, Quenech'du N, Giaume C, Cohen-Salmon M.
J Cereb Blood Flow Metab. 2012;32(8):1457-67. doi: 10.1038/jcbfm.2012.45. Epub 2012 Apr 4. PMID: 22472609
- 22) Bmcc1s, a novel brain-isoform of Bmcc1, affects cell morphology by regulating MAP6/STOP functions.
Arama, J.* **Boulay, AC***, Bosc, C., Delphin, D., Loew, D., Rostaing, P., Amigou, E., Ezan, P., Wingertsmann, L., Guillaud, L., Andrieux, A., Giaume, C., Cohen-Salmon, M.
PLoS One. 2012;7(4):e35488. doi: 10.1371/journal.pone.0035488. Epub 2012 Apr 16. PMID: 22523599
- 23)

Reviews

- 1) Astrocytes in the regulation of cerebrovascular functions.
Cohen-Salmon M, Slaoui L, Mazaré N, Gilbert A, Oudart M, Alvear-Perez R, Elorza-Vidal X, Chever O, **Boulay AC.**
Glia **2021**, 69 (4), 817–841. <https://doi.org/10.1002/glia.23924>.
- 2) Immunoregulation at the gliovascular unit in the healthy brain: A focus on Connexin 43.
Boulay AC, Cisternino S, Cohen-Salmon M.
Brain Behav Immun. 2016 Aug;56:1-9. doi: 10.1016/j.bbi.2015.11.017. Epub 2015 Dec 7. Review. PMID: 26674996