**MASTER 2 Neurosciences Fondamentales et Cliniques****Internship proposal 2021-2022***(internship from January to end of May 2022)***Host laboratory:** *Name + address*

Centre de Recherche en Neurosciences de Lyon (CRNL), équipe TIGER
CH Le Vinatier, Bât Neurocampus, 95 Bd Pinel, 69675 Bron Cedex

Host team : *team name + website*

Equipe TIGER (Translational and Integrative Group in Epilepsy Research)

Internship supervisors : *name + position + email*

Stéphane Marinesco
Stephane.marinesco@univ-lyon1.fr

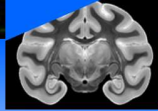
Project title :**BRAIN METABOLIC ADAPTATION TO NEUROINFLAMMATION****Project summary :** *approx 10 lines*

The brain reacts to injury (infection by a pathogen, toxic substance, neurodegenerative disease, traumatic injury, etc.) but a set of biochemical reactions called neuroinflammation. During neuroinflammation, astrocytes and microglia are activated for elimination of pathogens, necrotic cells or toxic molecules. This entire process consumes large amounts of energy, and the metabolic adaptations it induces are currently unknown. It is possible that the increased energy demand resulting from neuroinflammation makes the brain more vulnerable to injury and neurodegenerative diseases. This project will determine the effects of two pro-inflammatory conditions, septic shock by lipopolysaccharide administration and traumatic brain injury, on brain interstitial concentrations of glucose, lactate and oxygen. These metabolites will be monitored using minimally invasive microelectrode biosensors designed in our laboratory (ref 1). This project will further our understanding of brain metabolism in physiological and pathological conditions.

3-5 recent publications :

- 1 Chatard, C., Sabac, A., Moreno-Velasquez, L., Meiller, A. & Marinesco, S. (2018b) Minimally Invasive Microelectrode Biosensors Based on Platinized Carbon Fibers for in Vivo Brain Monitoring. *ACS Cent Sci*, **4**, 1751-1760 ;
- 2 Balança, B., Meiller, A., Bezin, L., Dreier, J., Lieutaud, T. & Marinesco, S. (2017) Altered hypermetabolic response to cortical spreading depolarizations after traumatic brain injury in rats. *Journal of cerebral blood flow and Metabolism*, **37**, 1670-1686.

Please send your proposal to emiliano.macaluso@univ-lyon1.fr and marion.richard@univ-lyon1.fr for publication on the Master of Neuroscience website.



- 3 Tholance Y, Barcelos GK, Perret-Liaudet A, Omar E, Carillon R, Grousseau S, Lieutaud T, Dailler F and **Marinesco S** (2017) Placing intracerebral probes to optimize detection of delayed cerebral ischemia and prediction of patient outcome in aneurysmal subarachnoid hemorrhage. *J Cereb Blood Flow Metab* 37: 2820-2832.
- 4 Le Douce J, Maugard M, Veran J, Matos M, Jegou P, Vigneron PA, Faivre E, Toussay X, Vandenberghe M, Balbastre Y, Piquet J, Guiot E, Thuy Tran N, Taverna M, **Marinesco S**, Koyanagi A, Furuya S, Gaudin-Guerif M, Goutal S, Ghetas A, Pruvost A, Bemelmans AP, Gaillard MC, Cambon K, Stimmer L, Sazdovitch V, Duyckaerts C, Herard AS, Delzescaux T, Hantraye P, Brouillet E, Cauli B, Olié S, Panatier A and Bonvento G (2020) Impairment of Glycolysis-Derived L-Serine Production in Astrocytes Contributes to Cognitive Deficits in Alzheimer's Disease. *Cell Metabolism*. 31(3):503-517.e8 doi: 10.1016/j.cmet.2020.02.004.