

MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2026-2027

(internship from January to June 2027)

Host laboratory:

CarMeN, Cardiovascular and Metabolic Diseases Laboratory
<https://carmen.univ-lyon1.fr/en/carmen/presentation-en/>

Host team:

IRIS, Ischemia Reperfusion Syndrome and Organ protection (Heart, Brain, Kidneys)
<https://carmen.univ-lyon1.fr/en/teams/team-iris/>

Internship supervisors:

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Project title:

Evaluation of an iron-chelating treatment in acute stroke using longitudinal imaging and neuroscores

Project summary:

The primary target of acute ischemic stroke (AIS) management is to restore brain perfusion as soon as possible to preserve the at-risk brain parenchyma. Reperfusion therapies are major advances, but 50% of AIS patients still suffer from poor clinical outcome. Even after tissue reperfusion, further damages can occur as oxidative stress, inflammation, secondary microcirculation impairment and blood-brain barrier (BBB) leakage may promote edema and haemorrhagic transformation. Iron pools from the blood is a major contributor of secondary damage after AIS through iron-induced oxidative stress and ferroptosis, a non-apoptotic form of cell death. This process is also involved in haemorrhagic stroke in which the rupture of the microvascular wall leads to the direct release of blood-derived iron into the parenchyma. The work aims at evaluating the protective effect of an iron-chelating treatment in acute stroke using longitudinal imaging and neuroscores in a preclinical stroke rodent model.

3-5 recent publications:

1. Chalet L, Rigollet S, Stupar V, Delphin A, Coudert T, Lemasson B, Barbier EL, Mechtouff L, Boutelier T, Canet-Soulas E, Christen T. Estimating blood oxygen saturation through susceptibility source separation: A new standpoint on quantitative BOLD models. *J Cereb Blood Flow Metab.* 2026;46(3):773-785.
2. Debatisse J, Chalet L, Eker OF, Cho TH, Becker G, Wateau O, Wiart M, Costes N, Mérida I, Léon C, Langlois JB, Lancelot S, Lux F, Boutelier T, Nighoghossian N, Mechtouff L, Canet-Soulas E. Quantitative imaging Outperforms No-Reflow in Predicting Functional Outcomes in a Translational Stroke Model. *Neurotherapeutics.* 2025; 22(2):e00529. doi: 10.1016/j.neurot.2025.e00529.
3. Becker G, Debatisse J, Rivière M, Crola Da Silva C, Beaudoin-Gobert M, Eker O, Wateau O, Cho TH, Wiart M, Tremblay L, Costes N, Mérida I, Redouté J, Léon C, Langlois JB, Le Bars D, Lancelot S, Nighoghossian N, Mechtouff L, Canet-Soulas E. Spatio-Temporal Characterization of Brain Inflammation in a Non-human Primate Stroke Model Mimicking Endovascular Thrombectomy. *Neurotherapeutics.* 2023. doi: 10.1007/s13311-023-01368-2.
4. Beccari S, Sierra-Torre V, Valero J, Pereira-Iglesias M, García-Zaballa M, Soria FN, De Las Heras-Garcia L, Carretero-Guillen A, Capetillo-Zarate E, Domercq M, Huguet PR, Ramonet D, Osman A, Han W, Dominguez C, Faust TE, Touzani O, Pampliega O, Boya P, Schafer D, Mariño G, Canet-Soulas E, Blomgren K, Plaza-Zabala A, Sierra A. Microglial phagocytosis dysfunction in stroke is driven by energy depletion and induction of autophagy. *Autophagy.* 2023. doi: 10.1080/15548627.2023.2165313.
5. Dumot C, Po C, Capin L, Hubert V, Ong E, Chourrout M, Bolbos R, Amaz C, Auxenfans C, Canet-Soulas E, Rome C, Chauveau F, Wiart M. Neurofunctional and neuroimaging readouts for designing a preclinical stem-cell therapy trial in experimental stroke. *Sci Rep.* 2022;12(1):4700.