

BIOGRAPHICAL SKETCH

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NAME: Stefano Fumagalli

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: Head of the Laboratory of Stroke and Vascular Dysfunctions

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Open University of London at Istituto di Ricerche Farmacologiche Mario Negri IRCCS, Milan, Italy	PhD	03/2013	Neuroscience
Istituto di Ricerche Farmacologiche Mario Negri IRCCS, Milan, Italy	Specialist in Pharmacological Research	06/2010	Neuroscience
University of Milan Bicocca, Italy	Master Degree	04/2007	Biotechnology

A. Personal Statement

My research domain is neuroinflammation after acute brain injuries, e.g. traumatic brain injury and brain ischemia. My activity is focused on the understanding of the mechanisms activated by the complement system after acute brain injury, including: pro-coagulant and pro-inflammatory events, interaction with brain resident/recruited cells (e.g. platelets, macrophages, microglia, neurons, astrocytes and endothelium), neurogenesis. A branch of my research is the study of the complement system in the context of atherosclerosis. Atherosclerosis is the main risk factor for ischemic stroke, since the atherosclerotic plaques may erode originating thromboembolic complications. There is no diagnostic method able to reliably detect vulnerable plaques. We demonstrated in patients that the complement system is involved in plaque erosion and may offer biomarkers for vulnerable plaque detection. My research on stroke patients' specimens exploits the collaborations with clinicians at the Gemelli Hospital of Rome (part of the RIN IRCCS Network), and at the Hospices Civil de Lyon, France (since an ERA-NET Neuron project I coordinated). The main experimental tools of my laboratory rely on experimental brain injury models in mice (trauma and ischemia), in vitro advanced culturing systems (IPSC-derived human organoids), imaging techniques (two photon, bright field, confocal three dimensional and superresolution microscopy) and on molecular analysis of biological samples.

B. Positions, Scientific Appointments, and Honors

2023-present	Head – Laboratory of Stroke and Vascular Dysfunctions, Department of Acute Brain And Cardiovascular Injury, Istituto di Ricerche Farmacologiche Mario Negri IRCCS, Milan
2019-2022	Head – Unit of Pathophysiology of Cerebrovascular Functions, Department of Neuroscience, Istituto di Ricerche Farmacologiche Mario Negri IRCCS, Milan
2015-2019	Senior Scientist, Department of Neuroscience, Istituto di Ricerche Farmacologiche Mario Negri IRCCS, Milan

2012-2015	Post doctoral fellow, Department of Neuroscience, Istituto di Ricerche Farmacologiche Mario Negri IRCCS, Milan
2009	Visiting Scientist, Strathclyde Institute of Pharmacy&Biomedical Sciences, University of Strathclyde, Glasgow, UK
2007-2012	Fellow, Department of Neuroscience, Istituto di Ricerche Farmacologiche Mario Negri IRCCS, Milan, Italy
2024-present	Deputy Coordinator of the PhD course of the Open University of London at the Istituto di Ricerche Farmacologiche Mario Negri IRCCS
2023-present	Associate Editor for Frontiers in Neurology (Stroke section)
2019-present	Review Editor for Frontiers in Neurology (Stroke section)

Grant reviewer

Foundation pour la Recherche sur le Accidents Vasculaires Cérébraux, France; National Science Centre (Narodowe Centrum Nauki), Poland; Research Council of Finland

Awards / Scholarships

2008	Master degree thesis awarded by the European Biomedical Research Association as best thesis on: 'Animal models for research in vascular pathologies'
2013	Award by the Società del Giardino, Milan, for scientific work in the Neuroscience

National Scientific qualification as associate professor (Abilitazione Scientifica Nazionale)

05/H2 – Histology (Istologia), from 21/11/2023 to 21/11/2034

C. Contributions to Science

Over the last 5 years, my key achievements include the identification of new thromboinflammatory mechanisms after acute brain injury, like ischemic stroke and traumatic brain injury (PMID: 33444093, 33444732). Namely, I have contributed to understand the role of the complement system after acute brain injury, including: pro-coagulant and pro-inflammatory events, interaction with brain resident/recruited cells (e.g. platelets, macrophages, microglia, neurons, astrocytes and endothelium), neurogenesis. The identified blood-borne inflammatory pathway (the lectin pathway of complement) represents an ideal pharmacological target for brain diseases, as its druggability does not require to cross the brain limitans (like the blood brain barrier), in support of its feasibility.

Key achievements include my effort at improving experimental stroke research translatability. In particular: 1) I have been involved in a multicentric preclinical randomized controlled trial, where I could coordinate a key phase of protocol harmonization to assess the primary endpoint (PMID: 36823998). 2) I contributed to develop new advanced in vitro models to study brain human pathologies (PMID: 36655331).

Selection of ten relevant publications for the proposal

1) Dalmau Gasull A, Glavan M, Reddy Samawar S, Kapupara K, Kelk J, Rubio M, Fumagalli S, Sorokin L, Vivien D, Prinz M

The niche matters: origin, function and fate of CNS-associated macrophages during health and disease
Acta Neuropathol 2024; 147: 37

2) Valente A, Mariani J, Seminara S, Tettamanti M, Pignataro G, Perego C, Sironi L, Pedata F, Amantea D, Bacigaluppi M, Vinciguerra A, Diamanti S, Viganò M, Santangelo F, Zoia C P, Rogriguez-Menendez V, Castiglioni L, Rzemieniec J, Dettori I, Bulli I, Coppi E, Di Santo C, Cuomo O, Gullotta G S, Butti E, Bagetta G, Martino G, De Simoni M G, Ferrarese C, Fumagalli S, Beretta S, TRICS Study Group

Harmonization of sensorimotor deficit assessment in a registered multicentre pre-clinical randomized controlled trial using two models of ischemic stroke
J Cereb Blood Flow Metab 2023; E-pub

3) Carbone F, Valente A, Perego C, Bertolotto M, Pane B, Spinella G, Palombo D, De Simoni MG, Montecucco F and Fumagalli S

- 4) Ficolin-2 serum levels predict the occurrence of acute coronary syndrome in patients with severe carotid artery stenosis
Pharmacological Research 2021; 166:105462
- 5) Mercurio D, Piotti A, Valente A, Oggioni M, Ponstein Y, Van Amersfoort E, Gobbi M, Fumagalli S, De Simoni M G
Plasma-derived and recombinant C1 esterase inhibitor: binding profiles and neuroprotective properties in brain ischemia/reperfusion injury
Brain Behav Immun 2021; Mar;93:299-311
- 6) Grossi C, Artusi C, Meroni P L, Borghi M O, Neglia L, Lonati P A, Oggioni M, Tedesco F, De Simoni M G, Fumagalli S
 β 2 glycoprotein I participates in phagocytosis of apoptotic neurons and in vascular injury in experimental brain stroke
J Cereb Blood Flow Metab 2021; Jan 14:271678X20984551
- 7) Fumagalli S, Fiordaliso F, Perego C, Corbelli A, Mariani A, De Paola M, De Simoni M-G
The phagocytic state of brain myeloid cells after ischemia revealed by superresolution structured illumination microscopy
J Neuroinflammation 2019; 16: 9
- 8) Pilely K, Fumagalli S, Rosbjerg A, Genster N, Skjoedt M-O, Perego C, Ferrante A M R, De Simoni M G, Garred P
C-reactive protein binds to cholesterol crystals and co-localizes with the terminal complement complex in human atherosclerotic plaques
Front Immunol 2017; 8: 1040
- 9) Fumagalli S, Perego C, Zangari R, De Blasio D, Oggioni M, De Nigris F, Snider F, Garred P, Ferrante A M, De Simoni M G
Lectin pathway of complement activation is associated with vulnerability of atherosclerotic plaques
Front Immunol 2017; 8: 288
- 10) Fumagalli S, De Simoni M G
Lectin complement pathway and its bloody interactions in brain ischemia
Stroke 2016; 47: 3067-3073

Complete list of publications in Scopus

<https://www.scopus.com/authid/detail.uri?authorId=7005453483>