

Marie Skłodowska Curie Individual Fellowship 2020

Expression of Interest for hosting Marie Curie Fellows

1. Supervisor (name and e-mail address)

Simone Piva, M.D.

2. Department (name and address)

Department of Medical and Surgical Specialties, Radiological Sciences and Public Health
Viale Europa, 11 25123 Brescia Italy

3. Panel (choose one)

- Chemistry (CHEM)
- Social Sciences and Humanities (SOC)
- Economic Sciences (ECO)
- Information Science and Engineering (ENG)
- Environment and Geosciences (ENV)
- Life Sciences (LIF)
- Mathematics (MAT)
- Physics (PHY)

4. Description of your research activities (max 10 lines)*

The purpose of this study is to elucidate the rule of the cross-talk between muscle and brain via muscle exosome in the pathogenesis of Sepsis Associated Delirium (SAD). The study will be carried out in two different steps:
STEP1 (Neuro-ICU step: ITALY): patients with SAD will be studied using functional brain MRI (fMRI), and exosomes from muscle biopsy will be isolated. The correlation between the failure of brain-muscle cross-talk and the presence of SAD will be clarified by cytotoxic activity.
STEP2 (Animal model step: JAPAN): the human muscle exosomes isolated from patients with SAD will be transfected in an animal model (rat) of sepsis, and micro fMRI of rats will be performed, eventually confirming the possible rule of muscle-derived exosomes in the brain-muscle cross-talk alteration.

5. Key-words

Delirium; muscle-brain cross-talk; exosomes; muscle; Intensive Care Acquired Weakness (ICUAW)

6. Short CV of the supervisor (max 5 lines)

Dr. Piva is a graduate in Anesthesia and Critical Care Medicine from the University of Brescia (MD), Italy. He completed his Research fellow at Harvard University (2005-2006), where he joined CBR Blood Research Institute and Children's Hospital (Boston). Consultant in Critical Care at Spedali Civili di Brescia University Hospital, Italy since 2007, He then joined S. Michael's Hospital (University of Toronto) for a clinical fellowship between 2010 and 2011. He published more than 20 papers. Dr. Piva has taken up a faculty position at Brescia University Graduate School of Medicine (December 2018).

7. List of 5 main publications of the supervisor

1. Morandi A, Piva S, Ely EW, et al. Worldwide Survey of the "Assessing Pain, Both Spontaneous Awakening and Breathing Trials, Choice of Drugs, Delirium Monitoring/Management, Early Exercise/Mobility, and Family Empowerment" (ABCDEF) Bundle. *Critical Care Medicine* 2017;45:e1111–e1122.
2. Fagoni N, Piva S*, Peli E, et al. Comparison between a nurse-led weaning protocol and weaning based on physician's clinical judgment in tracheostomized critically ill patients: a pilot randomized controlled clinical trial. *Ann Intensive Care*. 2018 Jan 22;8(1):11.
3. S. Piva, A. Di Paolo, L. Galeotti, et al. "Daptomycin Plasma and CSF Levels in Patients with Healthcare Associated Meningitis," *Neurocrit. Care*. 2019.
4. Piva, S., Fagoni, N. & Latronico, N. Intensive care unit-acquired weakness: unanswered questions and targets for future research. *F1000Research* 8, (2019).
5. Latronico, N., Piva, S., Fagoni, N. et al. Impact of a posttraumatic cerebral infarction on outcome in patients with TBI: the Italian multicenter cohort INCEPT study. *Crit Care* 24, 33 (2020).

*Please consider that the preparation of a Marie Curie proposal requires some time. Fellow and supervisor have to agree on a project and training opportunities for the fellow.