

MSC INTERNSHIP

DEEP-LEARNING APPROACHES FOR ULTRASOUND IMAGING OF THE DIAPHRAGM

PROJECT

We are developing innovative approaches based on multiparametric ultrasound imaging to assess the structure and the function of the muscles, in particular the diaphragm that is the main inspiratory muscle [1-3](#). Within this process, we are facing challenges regarding the automation of image analysis required for quantitative analyses.

Deep-learning approaches may help to reach this goal and contribute to speed up and improve the reliability of diaphragm ultrasound imaging.

Keywords: Computer vision, deep-learning, ultrasound imaging, skeletal muscle

HOSTING STRUCTURE AND TEAM

The Institute of Myology (Paris, France), is a multidisciplinary research center with expertise in muscle and its pathologies. This internship will be performed at the Neuromuscular Physiology Lab.

APPLICANT'S PROFILE

The candidate must be an MSc student in a relevant discipline.

DURATION

3 to 6 months. The ideal starting date is **January 2021**.

APPLICATION DETAILS

The application must be sent directly to Dr. Damien Bachasson, PT, Ph.D. (d.bachasson@institut-myologie.org). Please include a cover letter and CV with references. Shortlisted applicants will be contacted for an interview. Applications in French and English will be reviewed.

REFERENCES

- 1 Bachasson, D. *et al.* Diaphragm shear modulus reflects transdiaphragmatic pressure during isovolumetric inspiratory efforts and ventilation against inspiratory loading. *J. Appl. Physiol.* **126**, 699-707, doi:10.1152/jappphysiol.01060.2018 (2019).
- 2 Fossé, Q. *et al.* Ultrasound shear wave elastography for assessing diaphragm function in mechanically ventilated patients: a breath-by-breath analysis. *Critical Care* **24**, 669, doi:10.1186/s13054-020-03338-y (2020).
- 3 Poulard, T. *et al.* Ultrafast ultrasound coupled with cervical magnetic stimulation for non-invasive and non-volitional assessment of diaphragm contractility. *J. Physiol.*, doi:10.1113/JP280457 (2020).