



MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2022-2023

(internship from January to June 2023)

Host laboratory:

Lyon Neuroscience Research Center (CRNL)

Bât INSERM Bron 2, 16 av du doyen Lépine 69500 Bron

Host team :

IMPACT team of CRNL, web : <https://www.crnl.fr/fr/equipe/impact>

Internship supervisors :

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Project title :

Coupling between Perception and Action: the effect of attention on visuo-oculomotor adaptation

Project summary : *approx 10 lines*

Previous studies in the host team have shown that sensorimotor adaptation of ocular saccades ('saccadic adaptation') modulates visual attention shifts to the saccade target area (refs 1, 2). This effect has been interpreted as resulting from a coupling between attention and adaptation processes. This hypothesis predicts that, conversely, attentional load should modulate the efficiency (strength, time-course) of adaptation (ref 3). To test this hypothesis, we will develop a dual –attention/adaptation- task in human participants. The deployment of attention during saccadic adaptation will be manipulated by the following 3-factors design: attention load (high vs low) x attention goal (saccade target vs outer stimuli surrounding the saccade target) x post-saccade attention delay (20 ms vs 250 ms). A boost of saccadic adaptation in the high load / saccade target / 20 ms condition will provide strong evidence for the coupling hypothesis and for the existence of shared neural substrates of adaptation and attention processes.

3-5 recent publications :

1: Habchi, O., Rey, E., Mathieu, R., Urquizar, C., Farnè, A. and Pélisson, D. Deployment of spatial attention without moving the eyes is boosted by oculomotor adaptation, *Frontiers in Human Neuroscience* 2015 Aug 4;9:426.

2: Nicolas, J., Bidet-Caulet, A. and Pélisson, D. Reactive saccade adaptation boosts orienting of visuospatial attention, *Scientific Reports*, 2020, 10: 13430. <https://doi.org/10.1038/s41598-020-70120-z>

3: Gerardin, P., Nicolas, J., Farnè, A. and Pélisson, D. Increasing Attentional Load Boosts Saccadic adaptation, *Invest Ophthalmol Vis Sci*. 2015 Oct 1;56(11):6304-12

4: Cheviet, A., Masselink, J., Koun, E., Salemme, R., Lappe, M., Froment-Tilikete, C., Pélisson, D. Cerebellar signals drive motor adjustments and visual perceptual changes during forward and backward adaptation of reactive saccades. *Cerebral Cortex*, 2022, 1–21, <https://doi.org/10.1093/cercor/bhab455>

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