

## **Research Engineer**

### **Quantification of cervico facial tissues with elastography techniques (MRI, US)**

Elastography (MRI, US) is an imaging technique based on the propagation of shear waves in soft tissues that allows a quantification of mechanical properties (elasticity, viscosity). This technique has been successfully applied to healthy and pathological muscles as well as to fibrous tissues.

The objective will be to use the elastography techniques (MRI, US) to quantify the functional properties of the face and neck muscles before and after treatment. As part of a clinical protocol, the candidate will perform acquisitions on patients using elastography (MRI and / or US).

Facial expression is animated by the movements of the muscles, which can be altered during a pathology (facial paralysis, stroke, etc ...). Elastography could provide quantitative information on muscle function that will be essential for the evaluation of facial expression to adapt treatments. In addition, the functional properties of the neck muscles, and more particularly cervical fibrosis, which is radiation-induced, will be evaluated. The quantification and correlation of the level of fibrosis with the treatment will be a decisive factor in the evaluation of the benefit / risk ratio in these patients.

Patients will be recruited at Amiens University Hospital by the radiotherapy department (Dr Krzisch) and by the Department of Maxillofacial Surgery and Stomatology (Pr Devauchelle) in collaboration with the Facing Face Institute.

The developments of the elastography techniques, needed for these very specific muscles, will take place on the site of UTC (University Technology Compiègne) in the laboratory of Biomechanics and Bioengineering (BMBI, UMR CNRS 7338) in partnership with the Polyclinic Saint Côme (Dr Charleux), the Mayo Clinic (Rochester, MN, USA) and the MRI research department of the Facing Face Institute (Dr Constans).

#### **Candidate profile:**

PhD in MRI physics or Ultrasound or biomedical engineering

Solid knowledge in Matlab, C / C ++ programming

Experience in biomedical experimentation is essential

Ability and willingness to perform patient acquisitions as part of a clinical protocol and to work in a multidisciplinary environment.

#### **Information:**

- Location: The candidate will be based in Compiègne. Frequent trips to CHU Amiens are expected
- Starting October 2019 (to be discussed according to the availability of the candidate)
- Duration: 1 to 2 years
- Salary fixed by Philips company

#### **Contact:**

Please send your application with: CV, motivation letter, research report, list of publications as well as the contact of at least two referees to Sabine Bensamoun (DR2, CNRS): [sabine.bensamoun@utc.fr](mailto:sabine.bensamoun@utc.fr)