

## ITI HiFunMat Master Internship Proposal

M 1

M 2

**Title : Development of ratiometric fluorescent chemosensors for ferric iron detection in disease diagnosis**

### Internship supervisor

Name, first name	ALBRECHT, Sébastien
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Laboratory / Industry	LIMA
Collaboration with a HiFunMat member ( <i>please indicate their name</i> )	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes : Dr C. Ghimbeu IS2M
Address	3bis rue Alfred Werner, IRJBD-LIMA, Mulhouse

### Student profile looked for

Master program	<input type="checkbox"/> Material science and engineering <input checked="" type="checkbox"/> Chemistry <input type="checkbox"/> Physics
Minimum duration of internship	<input type="checkbox"/> 2 months <input type="checkbox"/> 4 months <input type="checkbox"/> 6 months
Other indications if necessary	2.5-3 months (from april, 01 <sup>st</sup> to June, 15 <sup>th</sup> )

### Internship description

Physiologically, Iron is the most abundant and versatile transition metal ion in human. Present in the cells to facilitate biological action, Iron metabolism disorders encompass a broad spectrum of common human diseases with diverse clinical manifestations, ranging from anemia to iron overload. Most pathological conditions are caused by extreme parameters e.g. too much or not enough iron. Multiple organs can be affected by excess iron and cause disease including Hereditary Hemochromatosis (HH) for the liver, ferritinopathy for the brain, macrophage overload, thalassemia syndromes or congenital- and acquired-sideroblastic anemias for the bone marrow compartment. Moreover, chronic oral administration or chronic blood transfusion may also induce iron overload.

The aim of this internship will be the development of novel ratiometric fluorescent chemosensors able to selectively detect intracellular endogeneous ferric iron.

In this position, you will design, plan and perform multi-step small molecule organic synthesis experimentation and evaluate the photophysical properties of the synthesized chemosensors. You will generate and evaluate data, interpret, report results, and draw conclusions.