# Call for a PhD position Proposal for Fall 2017 start

***Title of Project*: Electrospinning of bioactive glasses and amorphous calcium phosphates for biomedical applications**

***Duration:* 3 years**

***Sponshorship:* French ANR funding**

***Project Description:***

Every year, more than 200 000 orthopaedic prostheses (knee, hip) and a huge (but unknown) number of dental implants are implanted in France. For an optimal efficiency, these implants have to be well integrated in bone. To favor osseointegration, dental implants rely on modification of their surface morphology, while a **Calcium-Phosphate** (CaP) **coating** is often required on the surface of **orthopaedic implants**.

The whole project aims at developing alternative coating techniques, less costly and leading to more efficient coatings (higher adhesion to substrate, more reactive to allow faster bone ongrowth and faster healing of the patient) potentially applicable to both dental and orthopaedic implants. For this collaborative project, two Ph.D. students will be hired; each of them will work in different labs, on different setups but will have to work in close collaboration throughout the 3 years.

**In this Ph.D., osseoconductive coatings** displaying optimized architectures, compositions and structures (amorphous or crystalline), will be fabricated by an electrospinning-based setup on biomedical grade titanium substrates, leading to a **fine control of dimensions, composition, porosity and bioactivity** of the functional coating. Attempts will be focused simultaneously on CaP and bioglass based systems. In both cases, studies will be focused on solutions design, synthesis and optimization. After validation of the systems, efforts would be centered on the implementation of electrospinning.

The expected outputs of this project are:

- Scientific: obtaining stable over time, out-of-equilibrium, reactive CaP or bioactive glass phases is a scientific challenge. Understanding how these phases are stabilized during the process could open the way to new materials with original properties (reactivity, transport…).
- Industrial: after further development, the findings will allow biomaterial companies to implement new processes leading to innovative and efficient coatings for improved osseoconductivity of biomedical implants.
- Societal: the improved osseoconductiviy of these implants will allow faster healing of the patients, thus better comfort, shorter treatments thus lower treatment cost and hopefully better long term success.

***Application:***

Please send your motivation letter, CV and transcript of notes to the following contacts:


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