

*In collaboration with*

Is offering a **Post-Doc position of on year** in the field of:

Optical and mechanical properties of zirconia ceramics with nano-sized grains for dental application

Context and main topic:

Zirconia and lithium disilicate glass-ceramics are currently the most popular alternatives for monolithic restorations, since they offer good balance between strength, translucency and long-term properties in the buccal environment. High strength and translucency are generally not coincident in one restorative material and there is still a continuous development for a better balance between these two properties. In particular, there is a trend today to develop highly translucent yttria-doped zirconia ceramics by playing with the amount of yttrium and/or decreasing the grain size down to the nanoscale (i.e. below 100 nm).

In this work, zirconia ceramics processed by IVOCLAR VIVADENT (*Schaan, Liechtenstein*) with nano-sized grains and different amount of yttrium, will be characterized at MATEIS (*Villeurbanne, France*) in terms of strength, toughness and translucency and compared to their 'micro-scale' conventional alternatives. These properties will be characterized by state of the art methods used for these applications (Biaxial and 4-point bending, Single Edge Notched Beam, In-Line transmittance). The influence of nano-structure(s) on properties will be analyzed and simulated. On that respect, we aim at simulating the effect of grain size, porosity content and crystallographic features on the translucency, as well as understanding the potential effect of nano-scale features on crack resistance.

Requirements:

The candidates will have a PhD in the field of Materials Science, with a strong background in inorganic (ceramic) materials. Candidates with competences (attested by publications) in the field of zirconia and/or mechanical properties of ceramics and/or dental materials and/or transparent (translucent) ceramics will be regarded first. Knowledge of simulation tools/approaches in the field of microstructure-optical properties of ceramics will be a clear plus. We also wish to hire candidates with a certain international experience (excellent level in English is required).

Other:

After a Kick-off in the company, the Post-Doc will stay 2-3 weeks in the premises of IVOCLAR, before starting the work in MATEIS. This will allow to know better the company, the processing of dental zirconia and the materials of interest.

Application received in the form of a **short CV (including list of papers/communications) + Motivation letter**, by email at: jerome.chevalier@insa-lyon.fr before 20th January 12pm. Interviews will follow fast.