

**PhD student:**

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**The Title of Dissertation**

*Mathematical Modelling and Examination of Interaction and Changes between Bone Substitute, Jaw Tissue and Tooth Prosthesis*

Several authors have suggested that individual design of prosthesis is needed due to lack of “one prosthesis fits all” concept in practice. To better design such a prosthesis good understanding of processes following surgery associated with osteointegration of implant and bone is needed. In case of a weak tissue at the jaw, for example due to lack of teeth for long time, application of additional bone substitute material is needed to better fix the prosthesis in place and improve tissue regeneration.

Among several results obtained, three important aspects of this problem will be discussed at this presentation:

1. Results of experimental examination of cancellous bone failure mechanisms.
2. Modelling of bone tissue remodeling in several scenarios including the case when some teeth are missing.
3. Modelling and investigation of the influence of several mechanical and geometrical parameters in interactions between tooth implant, bio-resorbable material and bone tissue.

Future work will be discussed as well.

## **Publications and Conferences**

European Congress of Biomechanics 2003, Poster

Mexican Congress Innovation Match 2015, Poster

Mexican Congress Innovation Match 2016, Oral presentation

Hernandez-Rodriguez, Y., Lekszycki, T. Mathematical Modelling and Examination of Interaction and Changes between Bone Substitute, Jaw Tissue and Tooth Prosthesis, (submitted to ZAMM)