

# NEWSLETTER III.

NanoTI Project—Development of a titanium dental implant with superior antibacterial properties

July, 2015

## NanoTI Project news

It is the end of July, 2015, that means the project reached to halfway in the second period. Even though the partners achieved much, there is still a significant amount of work to be done. The in vitro and in vivo experiments are running parallel, in addition, based on what we learnt during demonstration, the fine tuning of the prototype became actual too.

### In vivo demonstration

**Q: Which species are involved? How?**

A: Actually, we are doing experiments on rats. The implants are being planted into the shin bone of the subjects.

**Q: Are these experiments ethically approved?**

A: Yes, we have a written approval signed by the ethical committee of the Technical University of Dresden.

### Project website

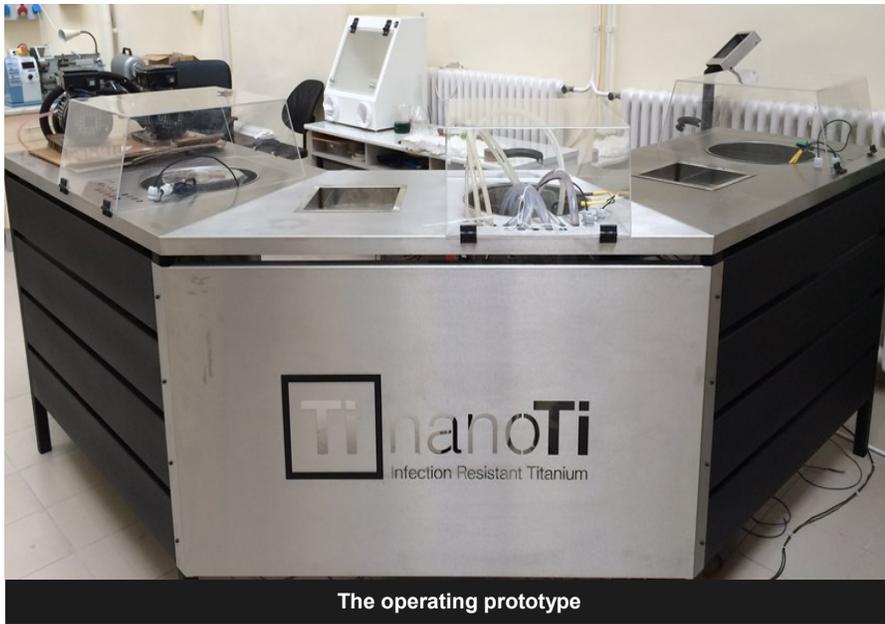
Further public information will be available soon on the official website of the project: [www.nanoti.eu](http://www.nanoti.eu)

*Members of the consortium:*



## Funding

The two year initiative has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration



The operating prototype

## Period 2 overview

The second period of the NanoTi project is mainly about the in vitro and in vivo experimentations. Besides of the demonstration activities, the partners are focusing on the further dissemination of the project results and the fine tuning of the prototype based on the knowledge of the field test. As we gain more and more experience with the operation of the device, the organization of knowledge transfer seminars and workshops became necessary. The RTDs are also working on the elaboration of an operation manual.

## The laboratory equipment

There are several types of surface treatment systems on the market for different applications, but systems designed exclusively for medical applications are not too common. The NanoTi surface treatment equipment is made especially for the treatment of dental implants. The mechanical unit has three separate parts: a table, tanks and sample holder.

The table provides safe and appropriate fixing for the tanks used for the subsequent technological steps, and also for the electronics and other auxiliary mechatronic units. The base material of the table is DC01 type sheet metal steel. The closed profiles are made from S235 steel. The table has been powder coated in order to make it durable and to give an aesthetic surface. This painting results in a rough surface with shining particles.

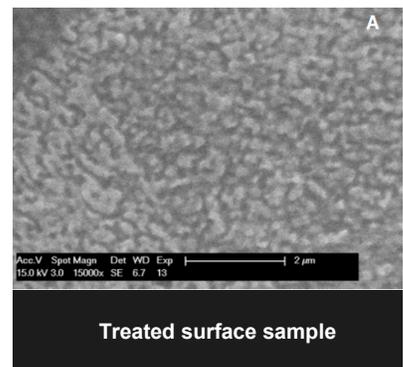
Thermal drilling process was also used for drilling, creating small horns or the threads. Thus, there is no need for additional parts for threads, fixture as this procedure results locally thick wall (in the horn). The tanks are made from commercially available pots coated by PTFE, and they will hold thermal conductive liquids that will be used to provide even heat transfer towards glass cups placed into it.

## The process

The surface treatment procedure comprises three separate steps, out of which chemical etching was optimized first defining the proper technical parameters such as etchant composition, etchant temperature and etching time. Weight measurement, stereo microscopic examination, SEM and EDS analyses, surface roughness measurements were performed before and after the etching process.

The second surface modification method involved in the project is electrochemical polishing which aims to produce a smooth, mirror-like surface creating an oxide layer.

The third surface treatment method is anodic oxidation which aims to create proper nanosurfaces on titanium discs. The pattern and surface energy of the created nanosurfaces have key roles in the behavior of the implants in microbiology and biocompatibility tests.



Treated surface sample

## Introduction of NanoTI SMEs:



Med Grupe was established in the year 2000 as a dental clinic with strong commitment to provide high-quality dental & oral healthcare services to the patients. The prospering business encouraged Med Grupe to extend its business activity and it has become a distributor of state-of-the-art dental products.

In the meantime, the management of Med Grupe is devoted to increase the general knowledge of the dental professionals by training and educations, while supply their doctors with cutting-edge technologies in order to not just follow but dictate the innovation in the field.

Med Grupe counts as a key partner for the clinical development of dental implants with NanoTi surface to prove the safety and efficacy of the antibacterial technology in both low-risk and high-risk patient populations.



Renata Giliene—Representative of UAB Med Grupe

## Where will be NanoTI in the future?

If you became interested, or just simply want to know more about the NanoTI project, it's partners and achievements, you shouldn't miss the following events, where we have been invited, or where we plan to disseminate the outcomes of our activities!

The list of the planned events where we will take part:

- Symposium of International Congress of Oral Implantologists 14-16/08/2015
- 4th TERMIS 08-11/09/2015
- 11th ThGOt 15/09/2015
- International Osteology Symposium 21-23/04/2016
- ITI Congress 28-30/04/2016
- International Dental Show and Implant Expo 25-26/11/2016

## Coordination

Just like in every successful team, there is a leader of the consortium in NanoTI project too. Besides the fulfillment of research and technical development activities, ATEKNEA is responsible for the smooth coordination of the project. The company has a long and very successful history in the coordination of similar projects in the Seventh Framework Programme. The aim in NanoTI is the same: to provide quality work, to finetune the project process, to communicate and to solve both usual and unusual situations to ensure the best possible outcome for all of the stakeholders involved in the project.



Ateknea —Building Innovative Solutions Together.

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