



Międzynarodowa Środowiskowa Szkoła Doktorska
przy **Centrum Studiów Polarnych**
w Uniwersytecie Śląskim w Katowicach

ul. Bedzińska 60
41-200 Sosnowiec
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Title of PhD project: Characteristics and selected properties of innovative materials and methods in the treatment of bruxism

Providing institute: University of Silesia in Katowice

Requirements:

1. Completed second-cycle studies (Master of Engineering) in the field of materials engineering.
2. Experience working in a research laboratory.
3. Knowledge of English enabling communication, reading and preparation of scientific publications.
4. Professional practice/internship in a dental office will be an additional advantage.

Description of the tasks:

1. Participation in preparing and conducting experiments;
2. Study methodology (including: XRD, SEM, EDS, MES, hardness measurement, MTG technique (dental physiotherapy));
3. Results analysis;
4. Preparation of scientific articles and conference presentations;
5. Regular reporting of work progress;
6. Participation in scientific tasks and didactic practices of the university where the doctoral thesis will be carried out

Summary of the doctoral project:

In recent years, there has been a significant increase in the number of cases of bruxism, which is a disorder involving pathological jaw clenching and teeth grinding, which has a psychosomatic basis. Strong facial muscle tension can lead to chronic conditions such as persistent head and neck pain, tooth sensitivity, skin problems, mental changes, and even breathing difficulties. The most common



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causes of this disease include genetic factors, chronic stress, malocclusion, gastric reflux and sleep disorders.

The main goal of the work will be to develop a material for a relaxation splint that will be characterized by high compressive strength, biotolerance, non-toxicity and lack of allergic reactions. Additionally, work will be carried out on the development of a container for storing the relaxation splint, which should have anti-aging properties, which will ensure that the splint maintains its mechanical and physicochemical properties.

Other information:

The work will be carried out under the supervision of:

dr hab. Małgorzata Karolus, prof. UŚ, malgorzata.karolus@us.edu.pl, Institute of Materials Engineering, Faculty of Science and Technology, University of Silesia in Katowice

The Secretary of the IEDS Recruitment Committee: +48 32 3689 380, e-mail: polarknow@us.edu.pl
Information on the IEDS admissions: <https://www.mssd.us.edu.pl/en/admission-2024-2025/>