Biodegradable Magnesium Material

Stimulating bone growth by hydroxyapatite addition

Challenges
Medical surgery of any type always imply risks that need to be reduced. Especially in the case of implants, it is difficult to find the right materials that are accepted by the body. Implants for bone fractures that are used for adults are usually removed, when there are complications with the tolerability or mobility. In the case of patients in their growth phase the implant needs to be removed in a second operation, as soon as the bone fracture is healed.

Technology
Scientists from the Helmholtz-Zentrum Geesthacht used their expertise in the field of Magnesium and the processes handling to develop a magnesium material with hydroxyapatite as an additive. It is a cytocompatible biomaterial with adjustable corrosion and mechanical properties. Magnesium as a natural part of the bone is not rejected by the body and the high corrosiveness benefits the constant degradation process inside the body. Hydroxyapatite that is accounted for around half the skeleton, is used to stimulate the bone growth.

Areas of Application
Magnesium alloys with hydroxyapatite additives are developed for medical devices to fixate bone fractures. Bones screws and plates for children, adults and also for animals are possible. Other additives can be used to further accelerate the healing process and to adjust properties. Other purposes of use that do not need a permanent implant can be suggested and pursued.

Development Status
The technology has a TRL of 5, the proof-of-concept and the validation in the lab are done. In vitro studies proved the acclaimed properties and benefits. In vivo studies still need to be done to validate the technology for the relevant application.

Exploitation Opportunity
Helmholtz-Zentrum Geesthacht offers the described technology for in-licensing and/or for the further development and exploitation. Within the scope of a cooperation, interested companies can be supported in adapting this technology to their specific requirements.

Publication