Special Seminar of the PhD-Program in Biomedical Engineering, host Bert Müller

Location: University of Basel, Pharmazentrum, Hörsaal 2

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Bio-degradable magnesium-based medical implants

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Abstract. For more than a century, magnesium and its alloys have been known to degrade under physiological conditions. A particular challenge, however, is the tailoring of the degradation characteristics of the implant within the human body. Pure magnesium corrodes in a rather uncontrolled manner, which is associated with immense hydrogen production and ion release. The loss of mechanical stability as well as the unwanted biological reactions related to pH changes lead to implant failure. Therefore, the selection of the alloying elements and the preparation procedure are critical for the clinical success. In this presentation, an overview of magnesium-based medical implants will be given with a focus on the interactions between the degrading material and cells/tissue.

Curriculum. Prof. Willumeit is a physicist by training and earned a PhD (Dr. rer. nat.) from The University of Hamburg, Germany with a thesis on localization of selected proteins in *E. Coli* ribosome using spin-dependent small-angle neutron scattering. In 2003, she obtained the *venia legendi* in biochemistry followed by a promotion to Professor for Structural Biochemistry. Since 2014, she holds the Chair of Biological Interfaces of Implants at the Christian Albrechts University in Kiel, Germany. Prof. Willumeit heads the Department of Metallic Biomaterials at the Institute of Materials Research, Helmholtz-Zentrum Geesthacht, Germany. With more than 200 journal publications, she is a well-respected materials scientist and also a member of the Scientific Advisory Board of the Department of Biomedical Engineering at the Medical Faculty, University of Basel, Switzerland.