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## The impact of implant material in the oral cavity on the human body – Long-term immune sustainability of dental implants.

For dental implants the bone-to-implant contact (BIC) is crucial for clinical success. The death of local bone marrow cells under constant stimulation by unfavorable factors such as titanium intolerance and dissolved titanium particles lead not only to implant loss but also to abnormal chronic **osteimmune function**. Decreased BIC around implants and connected bone marrow defects (BMD) are difficult to detect through X-rays and therefore little under research and widely unknown.

This lecture opens your mind how to evaluate the interaction of BMD around dental titanium (Ti-Impl) and ceramic implants (Cer-Impl) and we highlight the osteimmune derailment by proinflammatory **RANTES/CCL5 cytokine overexpression** in incomplete BIC.

To detect degenerated BIC a newly developed sonography device generates an ultrasound wave and passes that wave through the jawbone, called "Trans Alveolar Ultrasonography (TAU)". This newly available TAU device answers the questions:

- Can the TAU device accurately compare BIC around Ti-Impl to Cer-Impl with precise numerical scaling?
- Are Ti-Impl more connected to persisting osteonecrotic BMD?
- How is the impact of reduced BIC and osteonecrotic BMD to systemic immune diseases through **local chronic RANTES/CCL5 expression**?

Comparison of our data shows an osteoimmunological advantage of Cer-Impl over Ti-Impl and clear positive immune long-term differences of Cer-impl to Ti-Impl. Thus we provide new clinical knowledge in of implantology to detect osteonecrotic areas by TAU in daily practice.