PROS-UCL-FR

GENERAL PRESENTATION

➢**Complete denomination**: Department of Prosthetic Dentistry, Center for Dental Medicine, University Clinics Freiburg

➢**Location (city, country)**: Freiburg, Germany

➢**Director**: Prof. Dr. J.R. Strub

➢**Contact person in NEWGEN**: Prof. Dr. R.J. Kohal

➢**Working Group involvment**: WG 4

➢**Staff**: Prof. Dr. R.J. Kohal, Dr. Brigitte Altmann, Dr. Maria Bächle, Dr. Benedikt Spies, PD Dr. Frank Butz, Prof. Thorsten Steinberg, PD Al-Ahmad, Dr. Lamprini Karygianni

➢**Research topics**: preclinical: **cell evaluation** in monocultures and cocultures using osteoblasts, fibroblasts, keratocytes on different dental materials (especially ceramics for oral implants, regenerative materials), **in-vivo testing** of implant materials (animal investigations) – clinical: **clinical research** on ceramic/titanium implant materials, on bone substitiutes for bone regeneration; **microbial adhesion** on biomaterials, **biofilm formation** in-vitro and in-vivo, antimicrobial testing; long-term **biomechanical loading (chewing simulator)** of dental materials (especially ceramics for oral implants);

Researchers expertises: Experience and expertise in the application of oral implants and bone grafts *in vitro* and *in vivo* (preclinical and clinical investigations). Tissue engineering laboratory at the interface of material and life sciences. Expertise in the fields of experimental cell research and the development of biomaterials for soft and hard tissue regeneration. Profound experience in the interaction of microorganisms with biomaterials is vast (microbial adhesion on biomaterials, biofilm formation, antimicrobial testing, and biofilm formation *in vitro* and *in vivo*). Expertise in the evaluation of biomechanical behavior of oral implants in the artificial. mouth

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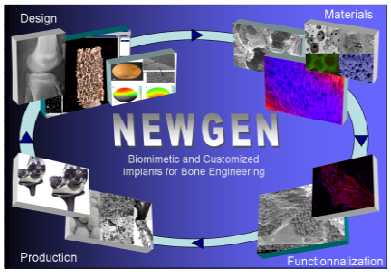
Dental School University Clinics Freiburg
Hugstetter Straße 55
79106 Freiburg – Germany
E-mail: ralf.kohal@uniklinik-freiburg.de



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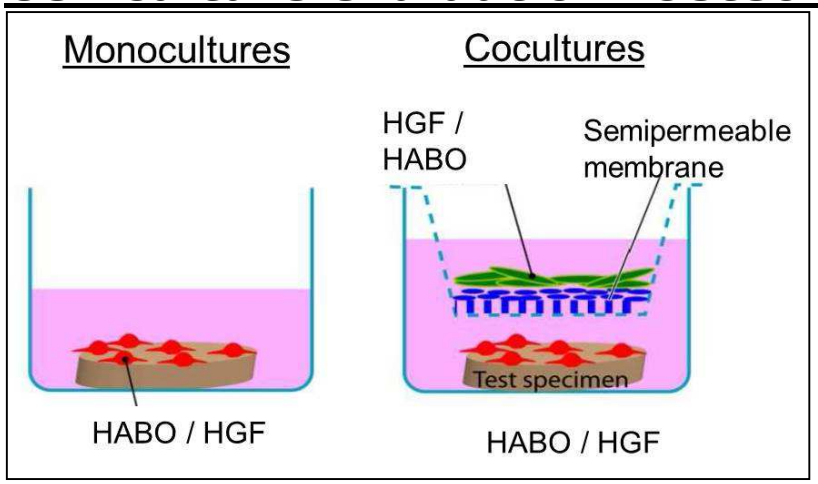
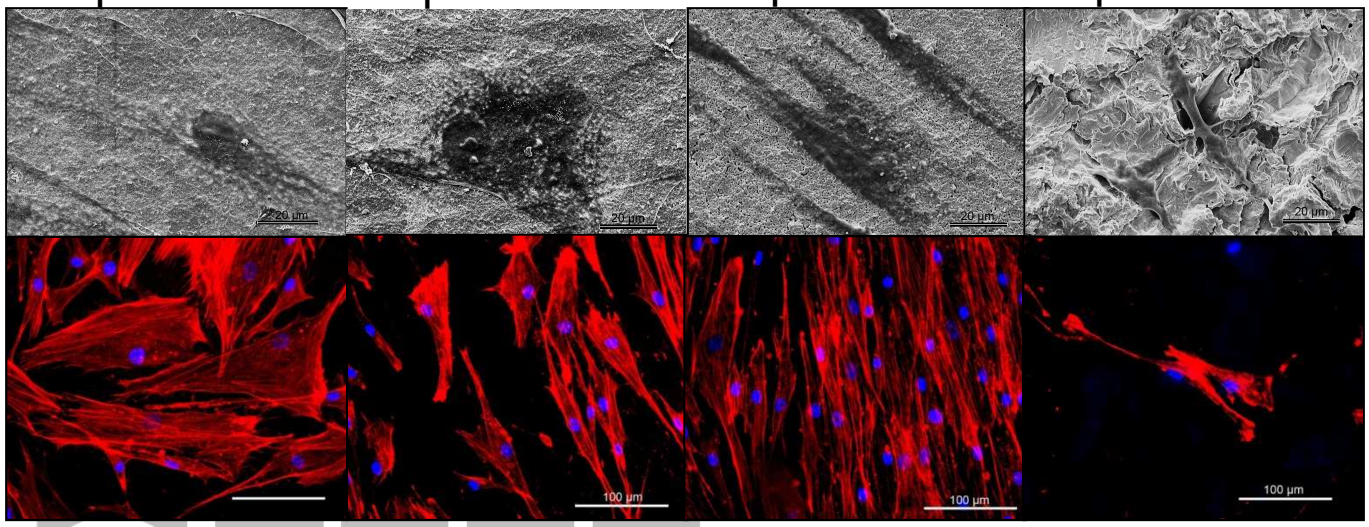
BIOMATERIALS/NEWGEN TOPICS

UNIVERSITÄTS KLINIKUM FREIBURG

Cell culture evaluation: Osteoblasts

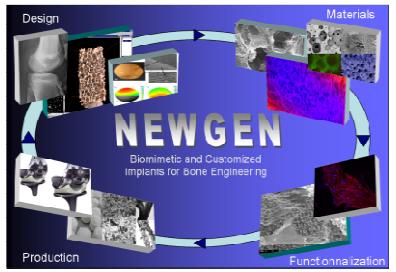


Specimen 1 Specimen 2 Specimen 3 Specimen 4



SEM evaluation

Actin cytosdkeleton staining



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Cell culture evaluation: Cell attachment and ECM Mineralization

Osteoblasts in growth medium

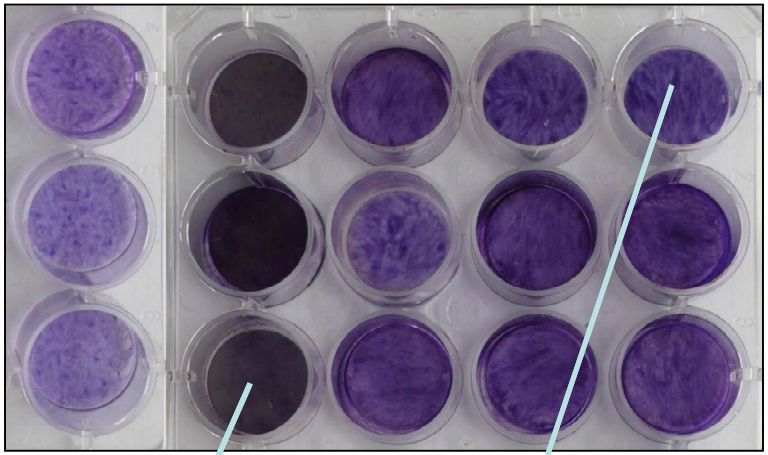
Osteoblasts in differentiation medium

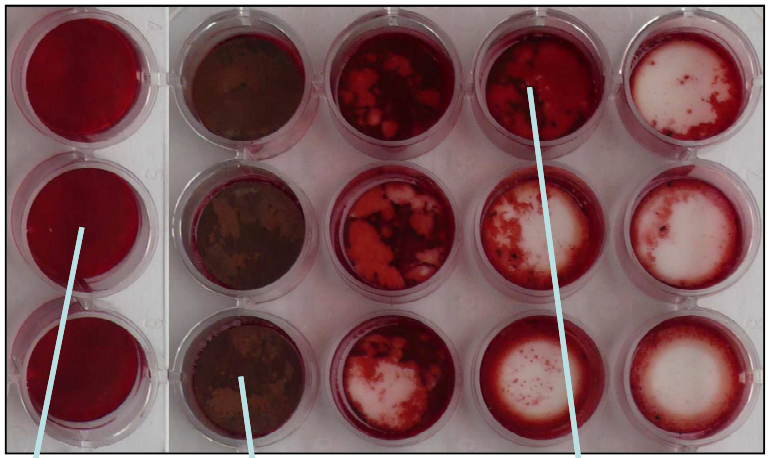
PS S1 S2 S3 S4

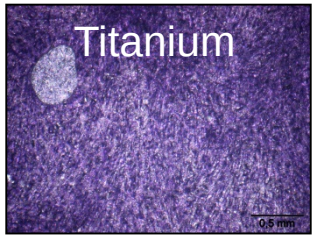
PS S1 S2 S3 S4

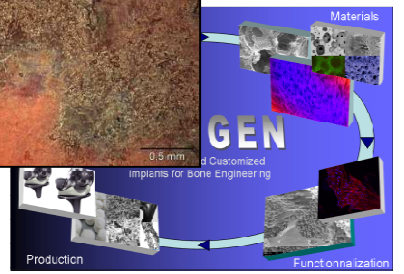
Toulidin blue staining

ARS staining (Ca)









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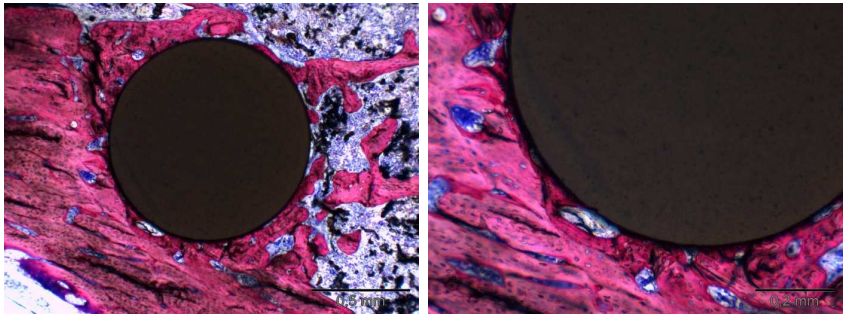
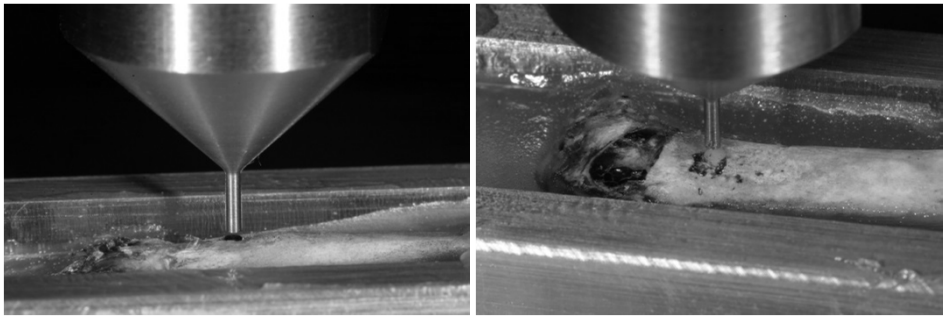
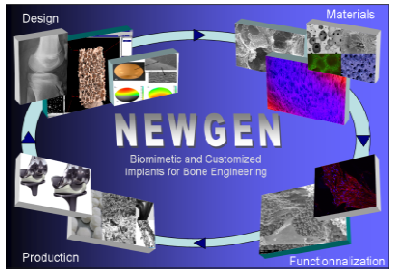
In-vivo testing:



Histology



Push-In test



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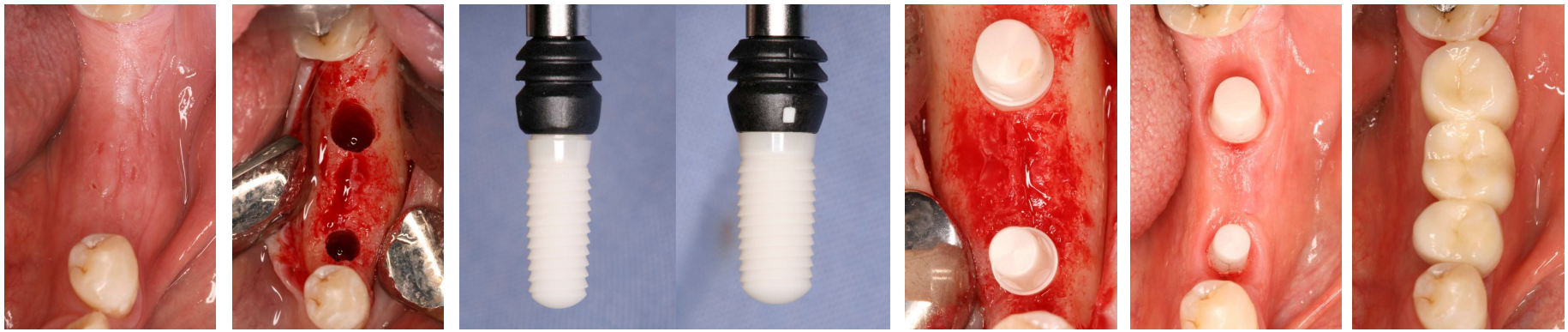
Clinical research:



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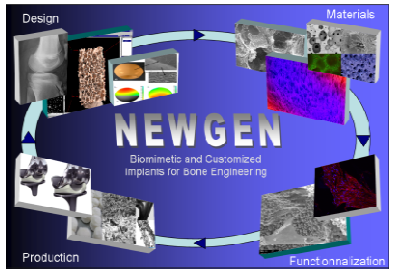

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BIOMATERIALS/NEWGEN TOPICS

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Microbial adhesion and biofilm formation

Materials **2013**, *6*, 5659-5674, doi:10.3390/ma6125659

OPEN ACCESS

materials

ISSN 1996-1944

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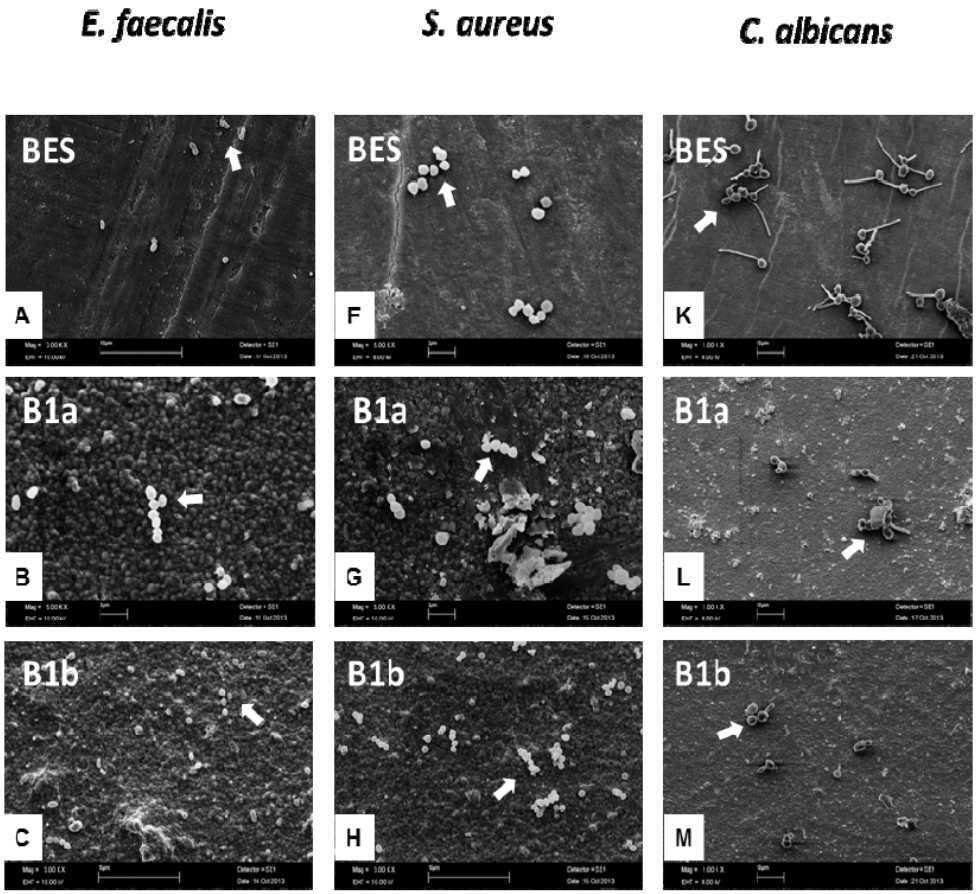
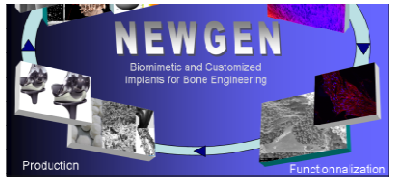
Article

Initial Bacterial Adhesion on Different Yttria-Stabilized Tetragonal Zirconia Implant Surfaces *in Vitro*

Lamprini Karygianni [1], Andrea Jähnig [1], Stefanie Schienle [1], Falk Bernsmann [2], Erik Adolfsson [3], Ralf J. Kohal [4], Jérôme Chevalier [5], Elmar Hellwig [1] and Ali Al-Ahmad [1,*]





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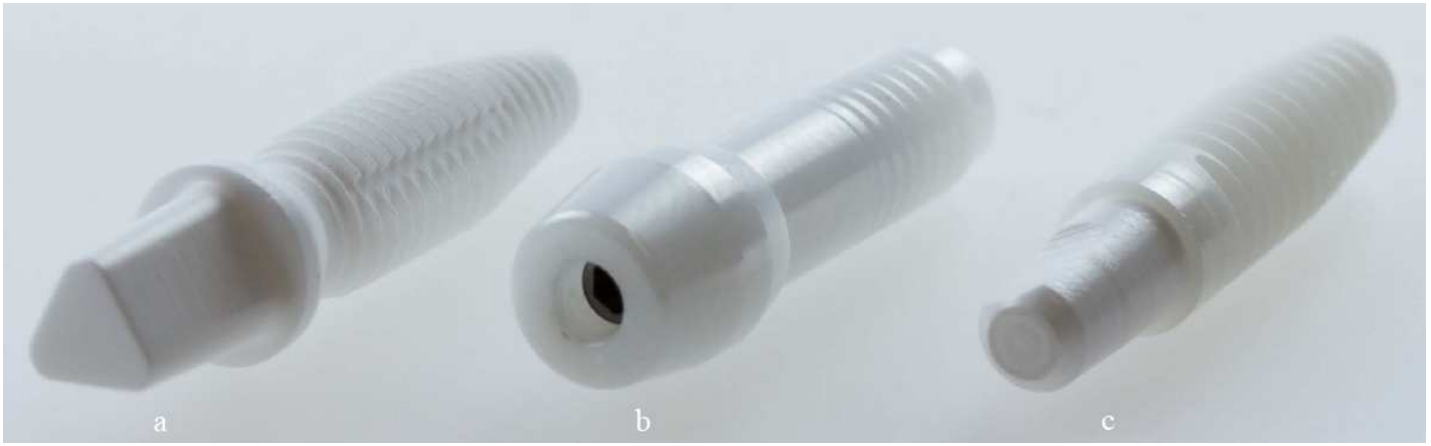
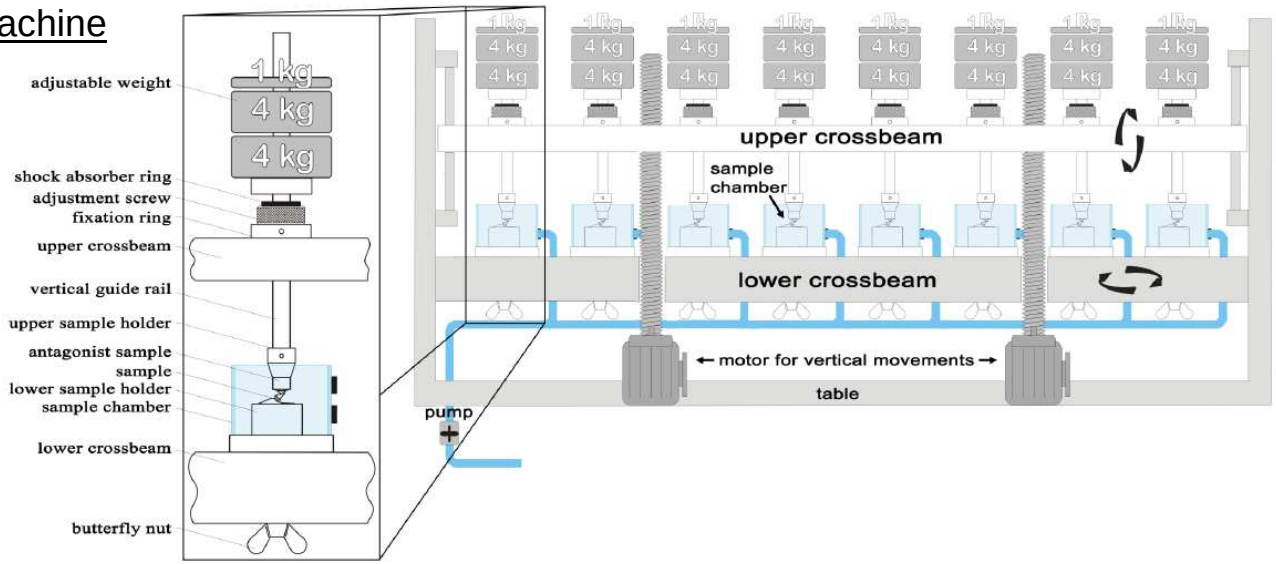


Settings of the chewing simulator machine

Chewing cycles	10.000.000
Cycle frequency	2 Hz
Vertical movement	6 mm
Horizontal movement	0.5 mm
Descending speed	60 mm/s
Rising speed 55 mm/s	
Forward speed	60 mm/s
Backward speed	55 mm/s
Applied weight per sample	10 kg (98 N)
Bath temperature	60 °C



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