

Alveolar augmentation and implant osseointegration: GBR, bone biomaterials, and biologics

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Surgical placement of oral implants is governed by the prosthetic design and by the morphology and quality of the alveolar bone. Often, implant placement may be difficult, if at all possible, due to alveolar ridge aberrations. In consequence, prosthetically dictated implant positioning commonly entails bone augmentation procedures. One objective of our laboratory is to evaluate the biologic potential of bone morphogenetic proteins (BMPs) including rhBMP-2, rhOP-1/rhBMP-7, rhGDF-5/rhCDMP-1, and other candidate biologics including PTH, osteoactivin, platelet-rich-plasma (PRP), and bone biomaterials and devices for alveolar ridge augmentation/implant fixation using discriminating, critical-size, clinically relevant supraalveolar defect models, peri-implantitis defect models and maxillary sinus models and canine, porcine and nonhuman primate platforms to explore their clinical potential. Critical-size rodent models are used for screening purposes of candidate biologics and biomaterials/scaffolds. This presentation will discuss the unique biologic potential, the clinical relevance and perspectives of recent and unpublished observations of BMP technologies for alveolar bone augmentation and oral implant fixation, in particular the development of a unique bone-inductive oral implant, BMP dosing and delivery strategies. This presentation will also address merits and explain short-comings of current treatment protocol including bone biomaterials, guided bone regeneration (GBR), and BMPs. Our studies suggest that BMPs have an unparalleled, dose dependent potential to augment alveolar bone and support implant osseointegration and long-term functional loading. Inclusion of BMPs for alveolar augmentation and osseointegration will not only enhance predictability of existing clinical protocol but radically change current treatment paradigms. Inclusion of the bone-inductive oral implant in the treatment panorama may make "grafting" and GBR procedures altogether obsolete.

Biography

Ulf ME Wikesjö received his DDS from the Faculty of Odontology, Lund University, Malmö, Sweden, and DMD from Temple University, Philadelphia, PA, USA; certification for advanced training in periodontology at Lund University, Sweden conferred by the National Board of Health and Welfare, Sweden, and from Loma Linda University, Loma Linda, CA, USA; and a Ph.D. (Odont Dr) on Experimental Wound Healing from Lund University, Sweden. He is an Adjunct Professor of Periodontology, Malmö University, Centre for Oral Health Sciences, Malmö, Sweden, and a Diplomate of the American Board of Periodontology. He serves on the editorial board of scientific journals in periodontology, implant dentistry and tissue engineering.

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