DukeNUS Medical School

Signature Seminar Series

Rejuvenation of fracture healing: It's all in the blood

ABOUT THE LECTURE

The capacity for tissues to repair and regenerate diminishes with age. We sought to determine the age-dependent contribution of native mesenchymal cells and circulating factors on in vivo bone repair. Here we show that exposure to youthful circulation by heterochronic parabiosis reverses the aged fracture repair phenotype and the diminished osteoblastic differentiation capacity of old animals. . This rejuvenation effect is recapitulated by engraftment of young haematopoietic cells into old animals. Using various genetically modified mice and bone marrow transplantation experiments, we found that the rejuvenation capacity is harbored by circulating macrophages, and intriguingly. found that transplantation of old macrophage lineage cells into young mice, results in an fracture repair phenotype that is usually observed in old animals. During rejuvenation, β-catenin signalling, a pathway important in osteoblast differentiation, is modulated in the early repair process and required for rejuvenation of the aged phenotype. Temporal reduction of β-catenin signalling during early fracture repair improves bone healing in old mice. Our data indicate that young haematopoietic cells of the macrophage lineage have the capacity to rejuvenate bone repair and this is mediated at least in part through β-catenin, raising the possibility that agents that modulate β-catenin can improve the pace or quality of fracture repair in the ageing population.

Speaker: ***Prof Benjamin Alman***
Distinguished James R. Urbaniak Professor
Chair, Department of Orthopaedic Surgery
Duke University

Host: ***Professor David Virshup***
Professor and Director
Cancer & Stem Cell Biology Programme
Duke-NUS Medical School

Date: **Friday, 8 April 2016**

Time: **12.00 PM— 1.00 PM (Refreshments will be served at 11.30 AM)**

Venue: **Duke-NUS Medical School**
Amphitheatre, Level 2

Contact Person: **Ms Cynthia Lim, Duke-NUS Research Affairs Department**
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ABOUT THE SPEAKER

Benjamin Alman MD, is the distinguished James R. Urbaniak professor and chair of the Department of Orthopaedic Surgery at Duke University School of Medicine. He grew up in Philadelphia, was educated at the University of Pennsylvania and Jefferson Medical School. He trained in surgery at Pennsylvanian Hospital and in orthopaedics at Tufts University before undertaking a fellowship in pediatric orthopaedics at the Hospital for Sick Children in Toronto. After a few years on practicing in Boston, he returned to a faculty position in Toronto, where he went on to be appointed the A.J. Latner Professor and chair of orthopaedics and vice chair for research in the Department of Surgery, University of Toronto. There he helped develop and implement a competency-based orthopaedicresidency curriculum, the first of its kind in any medical training field. Dr. Alman has an active clinical practice focusing on the care of children with pediatric orthopaedic problems, including tumors, congenital deformities, spinal deformity, syndromes, muscular dystrophies, and trauma.



**** Please be informed that photography and videography may be taken during the event for publicity purposes.***