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Design of nano-controllable release system for bone regeneration in craniofacial defects

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Cleft lip and palate is the most common birth deformity of the face, and occurs in one of every 600-800 newborns. Cleft lip and palate is believed to be a multi-factorial process, involving genetic and environmental factors. Approximately 75% cleft patients have an osseous defect in the alveolus, which could affect the normal development of a child's appearance and speech. The conventional strategy for the reconstitution of bone defect largely relies on multi-surgical procedures of bone grafts. One major shortcoming with regard to this technique is the absorption of the implanted bone grafts. The implantation of auto-bone graft or artificial bone substitutes always causes an inflammatory response, i.e. foreign body reaction, which induces the degradation of the implanted bone grafts. Recent cochrane systematic review has shown inconclusive results with this method. In order to prevent the inflammatory reaction against implanted bone grafts and to prevent the multi-surgical procedures in the treatment of cleft, a novel strategy to repair bony defects through an endogenous bone regenerative technique was proposed. This method bases on a nano-delivery release controlled system and applies the patient's own regenerative 'facilities', e.g., patient-derived growth factors, to build up a scaffold niche in the defected site where the stem cells/progenitor from neighboring tissues can be recruited for *in situ* regeneration of the hard tissue.

Biography

Adam Qingsong Ye, obtained his DDS, MDS, PhD (Ortho.), PhD (Med. Sci.) from China and the Netherlands. He is a Diplomate of Royal College of Surgeons of Edinburgh in Orthodontics, elected fellow of Royal Society of Medicine, UK, foundation member and coordinator of the orthodontic postgraduate program at James Cook University, AU. He has published about 40 articles with high impact factor and co-authored a P/G textbook entitled "Evidence-based Stomatology". He is also an ARC DECRA Fellow, and founder and leader of the Craniofacial and Orthodontic Research (CORE) group. He is Associate Editor of the Journal of World Federation of Orthodontists (JWFO) and Journal of Investigative and Clinical Dentistry *(JICD)*, President of the Asia Pacific Orthodontic Forum, regular referee for international journals and grants.

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