

Growth factor complex

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There have been enough published evidences suggesting that beneficial effect of stem cell may not be restricted to cell or tissue regeneration alone, but also due to their paracrine effects. Stem cells can secrete potent combination of trophic factors that mediate the molecular composition of the environment to elicit responses from resident cells. The trophic factors secreted by stem cell are usually known as growth factors and cytokines. Growth factor is a naturally occurring substance capable of stimulating cellular growth, cell proliferation, tissue healing and cellular differentiation. They are very important for signaling a variety of cellular processes. For more than 20 years, growth factors have been used in the treatments of blood diseases and cardiovascular diseases. These include platelet-derived growth factor (PDGF), transforming growth factor (TGF), tumor necrosis factor alpha (TNF alpha) and vascular endothelial growth factor (VEGF). Platelets also contain growth factors that are responsible for stimulating tissue regeneration, repairing damage tissues and stimulation of the wound healing processes as well. Platelets also release large amount of growth factors including PDGF, VEGF, TGF, epithelial growth factor (EGF) and fibroblast growth factor (FGF). Cytokines and chemokines are small proteins secreted by many cell types. They are important signaling messengers mediating cell communication and activating other cells through binding to specific receptors. Cytokines also play an important role in the immune system, in which the chemokines mainly function as chemo attractants. They also coordinate and regulate the biological processes such as cell growth and tissue repair. Our growth factor complex (GFC) in combination of tissue engineering has been developed as the innovative medical device. The goal of tissue engineering is to assemble functional constituents that restore, maintain or improve damaged tissues and organs. The system consists of GMP grade centrifuge and second-generation platelet-rich plasma (PRP) collection tubes. In this presentation, clinical studies aiming to assess the efficacy and safety of this innovative device for the treatments of low back pain and osteoarthritis are being reported. Rapid pain relief (within one week) was being achieved in more than 85% of the tested subjects. Decreased pain and improved function were also reported by most patients. No significant adverse effects were being reported. We are conducting further studies in sport injuries, in the aesthetic applications and the treatments of diabetic wounds. The results of these pilot studies are very encouraging. We believe that GFC medical device is a revolutionary and non-invasive treatment that uses the patients' blood samples to stimulate the natural healing process for a variety of orthopedic conditions and athletic injuries.

Biography

Win-Ping Deng obtained the doctorate in cancer biology at the Harvard University in 1993. In 2000, he joined the Faculty of Oral Medicine at the Taipei Medical University where now he is the Director of Stem Cell Research Center. Dr. Deng pioneered a new research for combining stem cell and molecular imaging to study the cancer therapy and tissue regeneration.

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