INTRODUCTION

Musculoskeletal disorders are among the most common medical disorders, that result in substantial reduction in health and quality of life, and also consider the most common causes of severe long-term pain and physical disability affecting hundreds of millions of people around the world. Currently, these incur more costs related to the medial care ***(Low, 2002)***.

The current treatments of those disorders have improved over the past 10 to 20 years, through sophisticated rehabilitation programs, novel operative techniques ***(Huard et al., 2003***), advances in pharmacology, newer techniques of imaging, surgery and man-made materials to replace diseased or damaged bone and cartilage. However, man-made materials, being non-living, are subject to wear and tear and loosening in the host bone ***(Low ,2002)***. Despite this considerable progress, no optimal therapy has been found ***(Huard et al., 2003)***. This promotes orthopedic surgeons and scientists to look for viable alternatives. In recent years, tissue engineering has gained increasing support, as a method to treat musculoskeletal disorders than traditional methods ***(Laurencin et al., 1999)***.

Tissue engineering is a new knowledge involving the use of scaffolds, natural tissues, cells and growth factors, with the goal of enhancing the natural healing process, or replacing damaged or deficient tissue by natural tissues ***(Oreffo and Trillin, 1999)***.

The Human Genome Project has provided us with a better understanding of disease genes and the possibility of gene manipulation to prevent and treat specific diseases ***(Low, 2002).***

Gene therapy using the transfer of defined genes encoding therapeutic proteins represent a promising way to efficiently deliver suitable growth factors into the injured tissue. ***(Huard et al., 2003).***

The combination of tissue engineering and gene therapy are better than tissue engineering alone ***(Hidaka et al., 1999)***. They are now at experimental and industrial levels and their clinical applications are increasingly numerous. ***(Hardouin et al., 2000)***.

Tissue engineering has been used as an optimal solution for critical sized bone defect, central meniscal tear, intervertebral disc lesion, ligament rupture and peripheral nerve injury.