Chondrogenic cells for cartilage regeneration

Brian Johnstone, PhD
Oregon Health & Science University
Dept of Orthopaedics and Rehabilitation
Portland, OR, USA

Over the past 30 years there has been an exponential rise in the scientific literature concerning stem cells and a concomitant rise in the pathologies that these cells are proposed to be therapeutic for. This has been particularly true in the orthopaedic field since it appears that many cell types are capable of skeletal differentiation pathways, at least in vitro. The reality is that 30 years on, effective stem cell therapies in the orthopaedic field remain elusive. One of the most promising areas for the use of stem/progenitor cells was thought to be in joint disease, from trauma-induced articular cartilage defects to osteoarthritis. There have been many chondrogenic cell types identified, or even created, yet the target of fixing even the simplest chondral defect has not yet been achieved with consistency. The field has been hampered by poorly defined cells being used in therapies that are not sophisticated enough to yield high success rates. The development of the field, the different therapies attempted, and newer ideas on the origins and fates of chondrogenic cells will be discussed.