cectomy usually involving the removal of about 25-40% of the meniscal tissue is the current most frequently used procedure. However, even with partial mensicectomy, a reduction in both shock absorption and the stability of the knee results in secondary osteoarthrosis in the medium to long-term. Better alternatives to partial meniscectomy are therefore being sort. Allograft transplantation is only partially successful as an alternative to total or partial menisectomy so currently only about 0.1% of meniscal procedures employ this approach. There is no proof that replacement of the meniscus with an allograft can re-establish some of the important meniscal functions, and thereby prevent or reduce the development of osteoarthrosis secondary to meniscectomy (Messner, K. and Gao, J. 1998. The menisci of the knee joint. Anatomical and functional characteristics, and a rationale for clinical treatment. Journal of Anatomy, 193:161-178). The major problems are the lack of remodeling of the graft resulting in inferior structural, biochemical and mechanical properties and insufficient fixation to bone (Messner and Gao 1998, Loc. cit). Further disadvantages include the shortage of suitable donors, difficulties with preservation techniques, the possible transfer of diseases, difficulty in shaping the implant to fit the donor and possible immunological reactions to the implant (Stone, K. R. Clinical Sports Medicine. 1996, 15: 557-571).

[0012] In addition to allograft procedures, a number of implantable materials have been suggested as replacements for surgically removed damaged meniscal tissue. These include: collagen treated with pepsin to render it substantially non-immunogenic and subsequently cross-linked with glutaraldehyde; a material made from the submucosa of the small intestine; cross-linked hyaluronic acid, Teflon fibre; carbon fibre; reinforced polyester; and polyurethane-coated Dacron. The mechanical properties of these implant materials are a poor match for those of meniscal fibrocartilage which has an unconfined compressive elastic modulus of about 0.4 to 0.8 MPa. These materials have poor resistance to wear and are not self healing. Some of the above are non-resorbable, and are not replaced by functional tissue in situ. It is therefore not surprising that partial or total meniscal replacements made from collagen, Teflon fibre, carbon fibre, reinforced polyester, or polyurethane-coated Dacron showed high mechanical failure rates (de Groot 1995 loc. cit.). Failure also results from poor fixation and severe inflammatory response (de Groot 1995 loc. cit.).

[0013] Elastomers based on amphiphilic urethane block copolymers have been suggested for meniscal repair and tested in an animal model. (Heijkants, R. G. J. C. 2004 Polyurethane scaffolds as meniscus reconstruction materials, Ph.D. Thesis, University of Groningen, The Netherlands, MSC Ph.D.-thesis series 2004-09; ISSN: 1570-1530; ISBN: 90 367 2169 5, chapter 10 pp 167-184). These materials are likely to produce less toxic degradation products than Dacron or Teflon. However, the mechanical properties of the polyurethanes tested did not match native meniscus very well (Heijkants 2004 loc. cit.) and this may help to explain why only poorly orientated collagen was found in the regenerating fibrocartilage in the implanted devices in place of the well-orientated collagen in a normal meniscus. A further potential problem was that the polyurethane materials produced a Stage I inflammatory response (giant cells and some macrophages) (Heijkants 2004 loc. cit.). A follow up study tested a polycaprolactone-polyurethane co-polymer porous meniscal repair device over a two year period. After the testing period the device demonstrated no resorption capability, was not replaced by functional meniscal tissue and demonstrated no prevention of cartilage damage (Welsing R. T. C, van Tienen, T. C., Ramrattan, N., Heijkants, R., Schouten, A. J., Veth, R. P. H. and Buma, P. 2008; Effect on tissue differentiation and articular cartilage degeneration of a polymer meniscal implant: a 2 year follow up study in dogs. Am. Jour. Sports Med. 36 1978-1989).

[0014] Recently, tissue engineering strategies for meniscal repair have been suggested including the use of biocompatible scaffolds as a substrate for regeneration, and cellular supplementation to promote remodeling and healing. Little is known, however, about the contributions of these novel repair strategies to the restoration of normal meniscal function (Setton, L. A., Guilak, F, Hsu, E. W. Vail, T. P. 1999 Biomechanical Factors in Tissue Engineered Meniscal Repair. *Clinical Orthopaedics & Related Research.* (367S) supplement :S254-S272, October 1999).

[0015] Intervertebral discs lie between the cartilage end caps covering the ends of the vertebral centra. They consist of an outer annulus fibrosus, which surrounds the inner nucleus pulposus. The annulus fibrosus consists of several layers of fibrocartilage. The nucleus pulposus contains loose collagen fibrils and chondrocytes suspended in a mucoprotein gel. Intervetebral discs provide a deformable space between the vertebral bodies which facilitates flexibility of the vertebral column while at the same time acting as a shock absorber (M. D. Humzah And R. W. Soames 1988 "Human Intervertebral Disc: Structure And Function", The Anatomical Record 220: 337-356). Prosthetic discs are used to replace damaged discs in patients with herniated lumbar intervertebral discs, degenerative disc disease in the lumbar region, or post-laminectomy syndrome. They are also used to treat patients with lower back pain refractory to conservative treatment for more than six months and patients currently considered suitable for spinal fusion surgery (NICE guidelines, http://www.nice.org.uk/guidance/index.jsp?action=byID&r=true &o=11081).

[0016] There are significant problems associated with the use of metal-containing and non-metallic prostheses for total disc replacement.

[0017] Resilience is an extremely important property for natural meniscal and articular cartilage and for materials used to repair them. Resilience can be defined as the extent to which the material returns to its original thickness after being compressed. More precisely it can be defined as the property of a material to store energy reversibly when it is deformed elastically. In the context of articular and meniscal cartilage it is important as it is a measure of the ability of the material to recover from the deformation caused by the compressive loading produced by standing, walking, running and other movements. The high resilience of meniscal cartilage is also important as it enables it to function as an efficient shock absorber during the repeated loading cycles of walking and running. Resilience can be measured in a number of different ways. Most accurately resilience is the maximum energy per volume that can be elastically stored and is therefore measured by determining the area under the elastic part of the stress-strain curve. The resilience of human articular cartilage measured in this way gave a value of 2.9 Jm^{-3} (Park, S. S., Chi, D. H., Lee, A. S., Taylor, S. R. & Iezzoni 2002, J. C. "Biomechanical properties of tissue-engineered cartilage from human and rabbit chondrocytes" Otolaryngology and head and neck surgery 126, 52-57). However it is simpler to