

ORTHOX LTD  
KEY DATA: FACT FILE

Technology  
Regenerative cartilage and bone materials

Established  
2008

Type  
Affiliate of Oxford BioMaterials Ltd

Employees  
4

Funding  
£4.5m: Wellcome Translation Award,  
TSB (7 awards), NIHR & EU

CEO  
Dr Nick Skaer  
Founded Orthox with Professor Oliver Kessler. Before this he was Chief Scientist and then CEO of Oxford Biomaterials Ltd from 2004 to 2009. During this period he co-authored 5 patents, including those assigned to Orthox. He studied Molecular Biology at the Universities of Oxford, Cambridge and Strasbourg, France, where he obtained his PhD.

Orthox is at the most advanced stage of commercial development of the three joint ventures established by Oxford Biomaterials. The company is applying Spidrex® as a material for the repair of worn joint surfaces (articular cartilage) and knee meniscus repair and replacement.

#### CARTILAGE REPLACEMENT

The Orthox process can precisely align the fibroin molecules in Spidrex® tissue scaffolds to capture the exceptional mechanical strength and resilience that is a feature of both spider silk and human cartilage. The fibroin material is also biocompatible and structurally similar to human fibronectin, a major component of cartilage, thereby providing regenerating cells with a familiar substrate on which to proliferate and deposit new tissue. Orthox believe that it is the first biomaterial product platform capable of both replicating the mechanical function of cartilage whilst also providing the potential for long term regenerative tissue repair.

Spidrex® appears to be ideal for this application because regenerative implants require materials that foster cell growth and encourage tissue regeneration. At the same time the materials ideally should be strong smooth and robust to allow rapid patient rehabilitation, simple and effective fixation in the defect, and provide the correct mechanical stimuli to the regenerating tissue. Because they bear a fairly strong homology to human structural proteins, such as fibronectin, Orthox has demonstrated that cells will adhere well to the silk fibroin and to functional new tissue.



Bone implant made from FibroFix™ Meniscus tough and resilient enough to survive the repetitive, compressive forces produced by walking and running.

#### CURRENT STATUS

Orthox is currently raising funds for clinical trials in the UK and Germany of both meniscal cartilage and articular cartilage products aimed at cartilage injuries to the knee. Without effective treatment, these injuries can progress to severe osteoarthritis, frequently necessitating eventual replacement of the entire joint.

The company says total knee replacement operations are forecast to rise by over 500% in the next two decades, highlighting the urgent clinical need. The Orthox trials will last around two years with the goal to confirm the efficacy and safety of the material indicated in pre-clinical trials.

Once FibroFix™ Meniscus, Orthox's lead meniscal cartilage repair product, has received CE marking, and is being successfully marketed in the EU, Orthox will seek approvals in the USA. It then plans to bring additional FibroFix™ cartilage and spinal disc products to market. Orthox has also developed SilkBone®, a platform technology to be used both as a bone anchor for other orthopaedic applications, or as a bone graft substitute. ■

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