Claims

1. A tubular tendon scaffold device comprising:

a porous core comprising a plurality of fibres, each fibre arranged along a longitudinal axis of the tubular tendon scaffold device; and

an outer portion formed from a film rolled into a cylindrical structure surrounding the porous core, the film having a plurality of elongated holes perforated through a thickness of the film so that the outer portion comprises a plurality of pores elongated along the longitudinal axis of the tubular tendon scaffold device, the outer portion having a plurality of ridges and grooves formed therein, the grooves being concave spaces between every two ridges;

wherein the plurality of fibres define a helix channel in the porous core.

2. The tubular tendon scaffold device as in claim 1, wherein the porous core comprises at least one of a biopolymer or a biopolymer composite, or the porous core comprises functionally graded hydroxyapatite.

3. The tubular tendon scaffold device as in claim 1, wherein the outer portion comprises at least one of a biopolymer or a biopolymer composite.

4. A method for fabricating a tubular tendon scaffold device as claimed in any one of claim 1 to 3, the method comprising:

forming a porous core, the porous core comprising a plurality of fibres, each fibre extending along a longitudinal axis of the tubular tendon scaffold device; and

forming an outer portion by rolling a film into a cylindrical structure surrounding the porous core, the film having a plurality of elongated holes perforated through a thickness of the film so that the outer portion comprises a plurality of pores elongated along the longitudinal axis of the tubular tendon scaffold device, the outer portion having a plurality of ridges and grooves formed therein, the plurality of grooves being concave spaces between every two ridges;

wherein forming the porous core comprises aligning the plurality of fibres on a water soluble substrate film, rolling the water-soluble substrate along a direction perpendicular

to a length of the plurality of fibres into a cylindrical structure and dissolving the water-soluble substrate such that the plurality of fibres define a helix channel in the porous core.

5. The method as in claim 4, wherein forming the porous core comprises electrospinning the plurality of fibres.

6. The method as in claim 4, wherein forming the porous core comprises uniaxially stretching the plurality of fibres.

7. The method of claim 4, wherein forming the outer portion further comprises heat welding the sheet.

8. The method of claim 4, wherein forming the outer portion further comprises uniaxially stretching the cylindrical structure along the longitudinal axis.

9. The method as in claim 4, wherein forming the outer portion comprises fitting the porous core into the outer portion and relaxing the porous core within the outer portion.