Claims

1. A ~~tissue~~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 ~~at least substantially~~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 ~~comprising~~comprises a plurality of pores elongated along ~~a longitudinal axis of the tissue scaffold device.~~

~~2. The tissue scaffold device as in claim 1, wherein the plurality of fibres are arranged along~~ the longitudinal axis of the ~~tissue~~tubular tendon scaffold device~~.~~

~~3. The tissue scaffold device as in claim 1, wherein each pore of the plurality of pores of,~~ the outer portion ~~is defined at least substantially entirely through a thickness of the outer portion.~~having a plurality of ridges and grooves formed therein, the grooves being concave spaces between every two ridges;

~~4. The tissue scaffold device as in claim 1, wherein the outer portion has at least one of a ridge aligned along the longitudinal axis or a groove aligned along the longitudinal axis.~~

~~5. The~~ tissue scaffold device as in claim 1, ~~wherein the tissue scaffold device is at least substantially tubular in shape.~~

~~6. The tissue scaffold device as in claim 1,~~ wherein the plurality of fibres ~~are arranged to~~ define a ~~helical~~helix channel ~~within~~in the porous core.

~~7~~2. The ~~tissue~~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.

~~8~~3. The ~~tissue~~tubular tendon scaffold device as in claim 1, wherein the outer portion comprises at least one of a biopolymer or a biopolymer composite.

~~9. The tissue scaffold device as in claim 1, wherein the porous core comprises functionally graded hydroxyapatite.~~

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4. A method for fabricating a ~~tissue~~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 ~~at least substantially~~by rolling a film into a cylindrical structure surrounding the porous core, the ~~outer portion comprising~~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 ~~a~~the longitudinal axis of the ~~tissue~~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;

~~11. The method as~~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 ~~10~~4, wherein forming the porous core comprises electrospinning the plurality of fibres.

~~12~~6. The method as in claim ~~10~~4, wherein forming the porous core comprises uniaxially stretching the plurality of fibres.

~~13.~~ 7. The method ~~as in~~of claim ~~10, wherein forming the porous core comprises aligning the plurality of fibres on a substrate.~~

~~14. The method as in claim 13, wherein aligning the plurality of fibres on the substrate comprises aligning the plurality of fibres on a soluble substrate.~~

~~15. The method as in claim 10, wherein forming the porous core comprises rolling the substrate along a direction perpendicular to a length of the plurality of fibres to form a helix structure.~~

~~16. The method as in claim 10, wherein forming the outer portion comprises forming a plurality of pores in a sheet.~~

~~17. The method as in claim 16~~4, wherein forming the outer portion further comprises ~~rolling the sheet into a tube.~~

~~18. The method as in claim 17, wherein rolling the sheet into the tube comprises~~ heat welding the sheet.

~~19.~~ 8. The method ~~as in~~of claim ~~17~~4, wherein forming the outer portion further comprises uniaxially stretching the ~~tube~~cylindrical structure along the longitudinal axis.

~~20~~9. The method as in claim ~~10~~4, wherein forming the outer portion comprises fitting the porous core into the outer portion and relaxing the porous core within the outer portion.