CLAIMS

1. An implantable light delivery device comprising:

a core portion cladded in a cladding, the core portion comprising up-conversion nano-particles encapsulated in an encapsulation material.

2. An implantable light delivery device according to claim 1 wherein the core portion and the cladding are flexible.

3. An implantable light delivery device according to claim 1 or claim 2, wherein a refractive index of the elongate core portion is greater than a refractive index of the cladding.

4. An implantable light delivery device according to any preceding claim, wherein the encapsulation material comprises hydrogel.

5. An implantable light delivery device according to any one of claims 1 to 3, wherein the encapsulation material comprises polydimethylsiloxane.

~~5~~6. An implantable light delivery device according to any preceding claim, wherein the cladding forms a tube.

~~6~~7. An implantable light delivery device according to claim ~~5~~6, wherein at least one of end of the tube is closed by the cladding.

~~7~~8. An implantable light delivery device according to any preceding claim, wherein the cladding comprises fluorinated ethylene propylene.

~~8~~9. An implantable light delivery device according to any preceding claim, wherein the core portion is elongate.

~~9~~10. An implantable light delivery device according to any preceding claim wherein the UCNPs are selected to absorb near infra-red radiation having a wavelength in the

range 700nm to 1400nm and to emit an emission spectrum in the having a wavelength in the visible range 300nm to 700nm in response to the near infra-red radiation.

~~10~~11. An implantable light delivery device according to claim ~~8~~10, wherein the excitation spectrum overlaps with an absorption spectrum of a photosensitizer.

~~11~~12. An Implantable light delivery device according to any preceding claim wherein a concentration of the up-conversion nano-particles in the core portion is substantially uniform along the core portion.

~~12~~13. An Implantable light delivery device according to any preceding claim wherein a concentration of the up-conversion nano-particles in the core portion is varies along the core portion.

~~13~~14. An implantable light delivery device according any preceding claim, comprising a plurality of elongate portions, each comprising a core portion cladded in a cladding, the core portion comprising up-conversion nano-particles encapsulated in an encapsulation material.

~~14~~15. An implantable light delivery device according to any one of claims 1 to ~~12~~13, comprising a portion configured as a deformable cup or a deformable hollow sphere.

~~15~~16. An implantable light delivery device according to any one of claims 1 to ~~12~~13, comprising an end portion configured as a solid sphere.

~~16~~17. An implantable light delivery device according to any preceding claim wherein the up-conversion nano-particles are configured to emit a first visible light emission in response to a first near infra-red radiation excitation and to emit a second visible light emission in response to a second near infra-red radiation excitation.

~~17. A photodynamic therapy method comprising:~~

~~implanting an implantable light delivery device according to any one of claims 1 to 16 into a subject;~~

~~administering a photosensitizer to the subject; and~~

~~illuminating the implantable light delivery device with radiation having excitation spectra corresponding to the up-conversion nano-particles.~~

18. A method of manufacturing an implantable light delivery device, the method comprising:

molding a mixture of an encapsulation material and up-conversion nano-particles;

causing the encapsulation material to polymerize.

19. A method according to claim 18, wherein molding the mixture comprises molding the mixture in a cladding.

20. A method according to claim 18 or claim 19, wherein causing the encapsulation material to polymerize comprises irradiating the encapsulation material with ultra-violet radiation.