CLAIMS

1. An anti-angiogenic agent comprising:

a multi-block copolymer in the form of one or more micelles,

wherein the copolymer comprises poly(ethylene glycol) (PEG), poly(propylene glycol) (PPG) and poly(caprolactone) (PCL),

wherein the PEG, the PPG and the PCL are chemically coupled together by at least urethane/carbamate linkage(s),

wherein the molar ratio of the PEG to the PPG in the copolymer is in the range of 1:1 to 10:1,

wherein the one or more micelles are not crosslinked together to form a hydrogel, and

wherein the copolymer is present in the anti-angiogenic agent at a total polymer concentration in the range of from 0.01 wt% to 2 wt%.

2. The anti-angiogenic agent as claimed in claim 1, wherein the molar ratio of the poly(ethylene glycol) (PEG) to the poly(propylene glycol) (PPG) to the poly(caprolactone) (PCL) in the copolymer is about 1 to 10 : 1 : 0.01 to 1.5.

3. The anti-angiogenic agent as claimed in any one of the preceding claims, wherein the anti-angiogenic agent comprises a water content of at least 90 wt%.

4. The anti-angiogenic agent as claimed in any one of the preceding claims, wherein the one or more micelles have a hydrodynamic size of from 1 nm to 100 nm.

5. The anti-angiogenic agent as claimed in any one of the preceding claims, wherein the anti-angiogenic agent further comprises one or more bioactive(s) complexed with or encapsulated by the copolymer micelles.

6. The anti-angiogenic agent as claimed in claim 5, wherein the one or more bioactive(s) comprises an anti-vascular endothelial growth factor (anti-VEGF).

7. The anti-angiogenic agent as claimed in claim 6, wherein the anti-VEGF is selected from the group consisting of bevacizumab, aflibercept, ranibizumab and brolucizumab.

8. The anti-angiogenic agent as claimed in any one of the claims 5-7, wherein the one or more bioactive(s) is encapsulated by the copolymer micelles at an encapsulation efficiency of more than 25%.

9. The anti-angiogenic agent as claimed in any one of the preceding claims, wherein the anti-angiogenic agent is formulated as a topical ophthalmic formulation.

10. A method of preparing anti-angiogenic agent as claimed in any one of the claims 1-9, the method comprising:

adding a copolymer to an aqueous medium at a concentration that is no less than the critical micelle concentration of the copolymer but no more than the sol-gel transition concentration of the copolymer, to form micelles,

wherein the copolymer comprises poly(ethylene glycol) (PEG), poly(propylene glycol) (PPG) and poly(caprolactone) (PCL),

wherein the PEG, the PPG and the PCL are chemically coupled together by at least urethane/carbamate linkage(s),

wherein the molar ratio of the PEG to the PPG in the copolymer is in the range of 1:1 to 10:1,

wherein the micelles are not crosslinked together to form a hydrogel, and

wherein the concentration of the copolymer in the aqueous medium is in the range of from 0.01 wt% to 2 wt%.

11. The method as claimed in claim 10, further comprising complexing or encapsulating one or more bioactive(s) with the micelle.

12. The method as claimed in any one of the claims 10-11, wherein the method further comprises coupling the PEG, the PPG and the PCL together by at least urethane/carbamate linkage(s), and wherein the coupling step is carried out in the presence of a coupling agent comprising an isocyanate monomer that contains two isocyanate functional groups.

13. The method as claimed in any one of the claims 10-12, wherein the method further comprises coupling the PEG, the PPG and the PCL together by at least urethane/carbamate linkage(s), and wherein the coupling step is carried out in the presence of a catalyst selected from the group consisting of alkyltin compounds, aryltin compounds and dialkyltin diesters such as dibutyltin dilaurate, dibutyltin diacetate, dibutyltin dioctanoate and dibutyltin distearate.

14. The method as claimed in any one of the claims 10-13, wherein the method further comprises coupling the PEG, the PPG and the PCL together by at least urethane/carbamate linkage(s), and wherein the coupling step is carried out in the presence of a solvent selected from the group consisting of toluene, benzene, xylene, halogenated organic solvents, halogenated alkane solvents, chlorinated solvents, dichloromethane, dichloroethane, tetrachloromethane and chloroform (or trichloromethane).

15. An anti-angiogenic agent as claimed in any one of the claims 1-9 for use in medicine.

16. An anti-angiogenic agent as claimed in any one of the claims 1-9 for use in the prophylaxis or treatment of an eye disorder.

17. An anti-angiogenic agent as claimed in any one of the claims 1-9 for use in the treatment of cancer.

18. Use of an anti-angiogenic agent as claimed in any one of the claims 1-9 in the manufacture of a medicament for the prophylaxis or treatment of an eye disorder selected from the group consisting of angiogenic eye disorders, ocular diseases in the anterior segment, ocular diseases in the posterior segment, neovascular related ophthalmic posterior segment diseases, retinal diseases, neovascular age-related macular degeneration (AMD) such as neovascular AMD, diabetic retinopathies, diabetic macular oedema (DMO), choroidal neovascularisation (CNV), central retinal vein occlusion (CRVO), corneal neovascularization, and retinal neovascularization.

19. Use of an anti-angiogenic agent as claimed in any one of the claims 1-9 in the manufacture of a medicament for the treatment of cancer for which blocking or reducing of angiogenesis in the cancer cells is therapeutically beneficial.

20. The anti-angiogenic agent of claim 16, wherein the eye disorder is selected from the group consisting of angiogenic eye disorders, ocular diseases in the anterior segment, ocular diseases in the posterior segment, neovascular related ophthalmic posterior segment diseases, retinal diseases, neovascular age-related macular degeneration (AMD) such as neovascular AMD, diabetic retinopathies, diabetic macular oedema (DMO), choroidal neovascularisation (CNV), central retinal vein occlusion (CRVO), corneal neovascularization, and retinal neovascularization.

21. The anti-angiogenic agent of claim 16, or the use of claim 18, wherein the anti-angiogenic agent is to be topically administered to a subject in need thereof.

22. The anti-angiogenic agent of claim 16, or the use of claim 18, wherein the anti-angiogenic agent is formulated as an eye drop.