We claim:

1. A functional TFE copolymer fine powder resin comprising

a TFE copolymer comprising a polymer chain of TFE and at least one comonomer having a functional group pendant to the polymer chain, wherein the concentration of said comonomer is less than 1 mol%,

wherein the functional TFE copolymer fine powder resin is paste extrudable and expandable into a porous functional TFE copolymeric material having a microstructure characterized by nodes interconnected by fibrils,

wherein said functional group imparts a chemical or physical property to said expanded copolymeric material upon reaction with a chemical reactant or reagent.

2. The functional TFE copolymer fine powder resin of claim 1, wherein the at least one comonomer having a functional group is a fluorovinyl ether of the general formula CF_2=CF—OR_fZ, where R_f represents a fluoro alkyl group optionally interrupted by one or more oxygen(s) and Z represents a functional group.

3. The functional TFE copolymer fine powder resin of claim 2, wherein Z is nitrile, aldehyde, carboxylic acid or salt, ester, amine, amide, carbonyl halide, sulfonyl halide, sulfonic acid or salts thereof, sulfonamide, sulfonimide, anhydride, sulfide, phosphonic acid or salts thereof, hydroxy (alcohol) sulfate esters, phosphate esters isocyanate, ketone, carbamate, disulfide, cyanate, triazine, amidine, thiol, imide, carbodiimide, imidazole, azide, azido, styrene, alkyl benzene, phenol, or catechol.

4. The functional TFE copolymer fine powder resin of claim 1 further comprising at least one additional polymer.

5. The functional TFE copolymer fine powder resin of claim 1 further comprising at least one additional fluoropolymer.

6. The functional TFE copolymer fine powder resin of claim 1 further comprising at least one additional perfluoropolymer.

7. The functional TFE copolymer fine powder resin of claim 4 wherein the at least one additional polymer is a second functional TFE copolymer.

8. The functional TFE copolymer fine powder resin of claim 4 wherein the at least one additional polymer is PTFE polymer.

9. The functional TFE copolymer fine powder resin of claim 4 wherein the at least one additional polymer is a modified PTFE polymer.

10. The functional TFE copolymer fine powder resin of claim 1, wherein the concentration of said comonomer is less than 0.5 mol%.

~~10. An expanded polymeric material comprising a functional TFE copolymer material having a microstructure characterized by nodes interconnected by fibrils wherein the TFE copolymer comprises a polymer chain of TFE and at least one comonomer having a functional group that is pendant to the polymer chain, wherein said functional group imparts a chemical or physical property to said expanded polymeric material upon reaction with a chemical reactant or reagent.~~

~~11. The expanded polymeric material of claim 10 further comprising at least one additional polymer.~~

~~12. The expanded polymeric material of claim 10 further comprising at least one additional fluoropolymer~~

~~13. The expanded polymeric material of claim 10 further comprising at least one additional perfluoropolymer~~

~~14. The expanded polymeric material of claim 11 wherein the at least one additional polymer is a second functional TFE copolymer.~~

~~15. The expanded polymeric material of claim 11 wherein the at least one additional polymer is PTFE polymer.~~

~~16. The expanded polymeric material of claim 11 wherein the at least one additional polymer is a modified PTFE polymer.~~

~~17. The expanded polymeric material of claim 10, wherein the at least one comonomer is a fluorovinyl ether comonomer of the general formula $CF_2=CF-OR_fZ$, where R_f represents a fluoro-alkyl group optionally interrupted by one or more oxygen(s) and Z represents a functional group.~~

~~18. The expanded polymeric material of claim 17, wherein Z is nitrile, aldehyde, carboxylic acid or salts thereof, ester, amine, amide, carbonyl halide, sulfonyl halide, sulfonic acid or salts thereof, sulfonamide, sulfonimide, anhydride, sulfide, phosphonic acid or salt, hydroxyl (alcohol) sulfate esters, phosphate esters, isocyanate, ketone, carbamate, disulfide, cyanate, triazine, amidine, thiol, imide,~~

~~carbodiimide, imidazole, azide, azido, styrene, alkyl benzene, phenol, or catechol.~~

~~19. The expanded polymeric material of claim 10, wherein the TFE copolymer comprises at least one functional group selected from nitrile, aldehyde, carboxylic acid or salts thereof, ester, amine, amide, carbonyl halide, sulfonyl halide, sulfonic acid or salts thereof, sulfonamide, sulfonimide, anhydride, sulfide, phosphonic acid or salt, hydroxyl (alcohol), sulfate esters, phosphate esters, isocyanate, ketone, carbamate, disulfide, cyanate, triazine, amidine, thiol, imide, carbodiimide, imidazole, azide, azido, styrene, alkyl benzene, phenol, or catechol.~~

~~20. The expanded polymeric material of claim 10, further comprising at least one bioactive species immobilized thereto.~~

~~21. The expanded polymeric material of claim 20, wherein the at least one bioactive species is immobilized to the functional group that is pendant to the polymer chain.~~

~~22. The expanded polymeric material of claim 20, wherein the at least one bioactive species is a bioactive polymer.~~

~~23. The expanded polymeric material of claim 20, wherein the at least one bioactive species is an organic material.~~

~~24. The expanded polymeric material of claim 20, wherein the at least one bioactive species is polysaccharide.~~

~~25. The expanded polymeric material of claim 20, wherein the at least one bioactive species is heparin.~~

~~26. The expanded polymeric material of claim 20 further comprising at least one spacer arm between the expanded polymeric material and the bioactive species.~~

~~27. The expanded polymeric material of claim 26, wherein the spacer arm is a bioactive species.~~

~~28. The expanded polymeric material of claim 26, wherein the spacer arm is immobilized to the functional group that is pendant to the polymer chain.~~

29. A process comprising

a) polymerizing TFE and at least one comonomer comprising a functional group to form a functional TFE copolymer having a multiplicity of functional groups that are pendant to the polymer chain;

b) expanding the functional TFE copolymer to form an expanded TFE copolymeric material having said functional groups and a microstructure characterized by nodes interconnected by fibrils, wherein said functional groups impart a chemical or physical property to said expanded copolymeric material upon reaction with a chemical reactant or reagent; and

c) reacting the functional groups after the step of expanding the functional TFE copolymer to change the chemical or physical property of the expanded functional TFE copolymer material.

30. The process of claim 29, wherein at least a portion of the initial functional groups are reacted with a chemical reagent or reactant to form a secondary functional group.

31. The process of claim 29, wherein the step of reacting comprises at least one chemical reaction.

32. The process of claim 29, wherein reacting the functional groups comprises reacting with a bioactive species.

33. The process of claim 32, wherein the bioactive species is a carbohydrate.

34. The process of claim 32, wherein the bioactive species is a polysaccharide.

35. The process of claim 34, wherein the the polysaccharide is chitin, glycogen, heparin, heparan sulfate, hyaluronic acid, alginic acid, dextran sulfate, cyclodextrin, agar, agarose, chitosan, cellulose and its derivatives, starch, and starch polyaldehyde.

36. The process of claim 29, wherein reacting the functional groups comprises reacting with a synthetic polymer.

37. The process of claim 36, wherein the synthetic polymer is TFE-PMVE-8CNVE,TFE-VDF-HFP-8CNVE, poly(vinyl acetate), poly(vinyl alcohol), poly(ethylene glycol), poly(propylene glycol), poly(ethylene imine), poly(ethyl acrylate), poly(acrylic acid),

poly(acrylonitrile), poly(ethylene vinyl acetate), polyethylene vinyl alcohol, poly(acrylamide), poly(n-butyl isocyanate), poly(vinyl pyrrolidinone), poly(hydroethyl acrylate), poly(silane), poly(dimethylsiloxane), poly(lactic acid), poly(methacrylonitrile), or poly(L-lactide), or their copolymers.

38. The process of claim 31 wherein the chemical reaction is hydrolysis of esters to form alcohols,hydrolysis of esters to form carboxylic acids, thiol nucelophilic substitution, Michael's addition, transamidation, isocyanurate formation, uret formation, dehydrogenation and unsaturation formation, electrophilic addition, nucleophilic substitution, elimination, or condensation.

39. The process of claim 31, wherein the chemical reaction is aminolysis of esters to form amides.

40. The process of claim 31, wherein the chemical reaction is proton abstraction.

41. A composite comprising an expanded functional TFE copolymer material characterized by nodes interconnected by fibrils comprising a copolymer of TFE and at least one comonomer having a functional group that is pendant to the polymer chain and at least one bioactive species immobilized thereto, wherein said functional group imparts a chemical or physical property to said expanded copolymer material upon reaction with a chemical reactant or reagent.

42. The composite of claim 41 wherein the at least one bioactive species is a bioactive polymer.

43. The composite of claim 41 wherein the at least one bioactive species is an organic material.

44. The composite of claim 41 wherein the at least one bioactive species is heparin or heparan sulfate.

45. The composite of claim 41 comprising:

a first layer comprised of a least one species of polymeric surfactant non-covalently attached to the expanded functional TFE copolymer material, wherein the polymeric surfactant is chemically different than the expanded functional TFE copolymer material, and wherein the polymeric surfactant is cross-linked to itself;

~~a second layer comprised of at least one species of hydrophilic polymer covalently attached to the first layer;~~

~~and at least one bioactive species attached to the second layer.~~

~~46. The composite of claim 45 wherein the polymeric surfactant comprises a bioactive species.~~

~~47. A composite comprising an expanded functional TFE copolymer material characterized by nodes interconnected by fibrils comprising a copolymer of TFE and at least one comonomer having a carboxylic acid functional group that is pendant to the polymer chain, wherein said carboxylic acid functional group imparts a chemical or physical property to said expanded copolymer material upon reaction with a chemical reactant or reagent, and a polysaccharide containing a hydroxyl functional group wherein the composite comprises an ester bond between the expanded functional TFE copolymer material and polysaccharide.~~

~~48. A composite comprising an expanded functional TFE copolymer material characterized by nodes interconnected by fibrils, the composite comprising:~~

~~a.) a copolymer of TFE and~~

~~b.) at least one comonomer having an amine functional group that is pendant to the polymer chain, wherein said amine functional group imparts a chemical or physical property to said expanded copolymer material upon reaction with a chemical reactant or reagent, and~~

~~c) a polysaccharide immobilized thereto.~~

~~49. The composite of claim 47 or claim 48, wherein the functional group of the comonomer are initial functional groups and at least a portion of the initial functional groups are reacted to form a secondary funtional group, the secondary functional group comprising a carboxylic acid or an amine, and a polysaccharide immobilized thereto.~~

~~50. The composite of claim 47 or claim 48 further comprising a spacer arm.~~

~~51. A medical device comprising an expanded polymeric material comprising a functional TFE copolymer material having a microstructure characterized by nodes interconnected by fibrils wherein the TFE copolymer comprises a polymer chain of TFE and at least one comonomer having a functional group that is pendant to the polymer chain, wherein said functional group imparts a chemical or physical property to said expanded polymeric material upon reaction with a chemical reactant or reagent.~~

52. The medical device of claim 51 wherein the expanded polymeric material further comprises at least one bioactive species immobilized thereto.

53. The medical device of claim 52 further comprising a spacer arm.

54. A medical device comprising an expanded functional TFE copolymer material characterized by nodes interconnected by fibrils comprising a copolymer of TFE and at least one comonomer having an amine functional group that is pendant to the polymer chain, and a polysaccharide immobilized thereto, wherein said amine functional group imparts a chemical or physical property to said expanded copolymer material upon reaction with a chemical reactant or reagent.

55. A composite membrane comprising:

a. An expanded polymeric material comprising a functional TFE copolymer material having a microstructure characterized by nodes interconnected by fibrils wherein the TFE copolymer comprises a polymer chain of TFE and at least one comonomer having a functional group that is pendant to the polymer chain, wherein said functional group imparts a chemical or physical property to said expanded polymeric material upon reaction with a chemical reactant or reagent; and

b. a material at least partially imbibed into said expanded polymeric material.

56. The composite membrane of claim 55 wherein the imbibed material substantially occludes the pores of the expanded polymeric material.

57. The composite membrane of claim 55 wherein the imbibed material substantially occludes the pores of the expanded polymeric material and has a gurley value of greater than 10,000 seconds.

58. The composite membrane of claim 55 wherein the imbibed material comprises a polymer.

59. The composite membrane of claim 55 wherein the imbibed material is covalently bonded to said at least one functional group that is pendant to the polymer chain.

60. The composite membrane of claim 55 wherein the imbibed material comprises an ion exchange material.

61. The composite membrane of claim 60 wherein the ion exchange material comprises a perfluorsulfonic acid.

~~62. An expanded polymeric material comprising a functional TFE copolymer material having a microstructure characterized by nodes interconnected by fibrils wherein the TFE copolymer comprises:~~

~~a) a polymer chain of TFE and at least one comonomer having a functional group that is pendant to the polymer chain, wherein said functional group imparts a chemical or physical property to said expanded polymeric material upon reaction with a chemical reactant or reagent; and~~

~~b) a filler material.~~

~~63. The composite membrane of claim 62 wherein the filler material is covalently bonded to said at least one functional group that is pendant to the polymer chain.~~

~~64~~11. A process comprising:

providing a functional TFE copolymer fine powder resin comprising:

a) TFE copolymer comprising a polymer chain of TFE and at least one comonomer having a functional group pendant to the polymer chain, wherein the concentration of said comonomer is less than 1 mol%,

wherein the functional TFE copolymer fine powder resin is paste extrudable and expandable into a porous functional TFE copolymeric material having a microstructure characterized by nodes interconnected by fibrils, wherein said functional group imparts a chemical or physical property to said expanded copolymeric material upon reaction with a chemical reactant or reagent; and

b) treating said functional TFE copolymer fine powder with radiation.

~~65~~12. The process of claim ~~64~~ 11 wherein the TFE copolymer fine powder resin is treated with radiation in the presence of a reactant.

13. The process of claim 11, wherein the concentration of said comonomer is less than 0.5 mol%.

~~66. A process comprising:~~

~~a. providing an expanded polymeric material comprising a functional TFE copolymer material having a microstructure characterized by nodes interconnected by fibrils wherein the TFE copolymer comprises a polymer chain of TFE and at least one comonomer having a functional group that is pendant to the polymer chain, wherein said functional group imparts a chemical or physical property to said expanded polymeric material upon reaction with a chemical reactant or reagent; and~~

~~b. treating said functional expanded polymer material with radiation.~~

~~67. The process of claim 66 wherein the expanded polymeric material is treated with radiation in the presence of a reactant.~~