What is claimed is:

1. A template for directing a pattern in a block copolymer film, said block copolymer having two or more spontaneously separating blocks, wherein the block copolymer has a characteristic pitch, said template consisting essentially of:

a. a substrate consisting essentially of a base and a neutral coating on the base, said neutral coating having an array comprising two or more trenches etched therein; said trenches having wads and floors, and

wherein said neutral coating, prior to trench etching is formed from functionalized polymer brushes, cross-linkable polymers, or random copolymers, or blends of homopolymers; and

b. a pinning material in the trenches, said pinning material having a greater affinity for one of the two or more spontaneously separating blocks than for any other of the two or more spontaneously separating blocks, and wherein the pinning material is coated on the walls and floors of the trenches and conforms to the walls of the trenches and the trenches are maintained, and wherein the widths of the trenches are dimensioned in a manner effective to direct a pattern by pinned chemoepitaxy in a block copolymer film that overlays both the neutral layer and the trenches, wherein the pinning material comprises a polymer comprising a repeat unit selected from a group consisting of substituted styrene, unsubstituted styrene, (meth)acrylate, substituted vinyl pyridine, unsubstituted vinyl pyridine, a diene, one or more olefins, an unsaturated anhydride, an unsaturated diacid, an unsaturated acid-ester, one or more olefin oxides, a dioxane, a homopolyester, a heteropolyester couple, a homopolyamide couple, a heteropolyamide couple or combinations thereof and further wherein the pinning material comprises a monofunctional or difunctional telechelic polymer, comprising a reactive end group selected from a group consisting of an alcohol group, an ester

group, a carbonate group, a carboxylic acid group, a phosphonic acid group, a sulfonic acid group, an amine group, an amide or imide group, an epoxy group, a silyl group, an alkoxysilyl group, an alkylsilyl group, an aminosilane group, a nitrile group, an isocyanate group, a thiocyanate group, and an isothiocyanate group.

2. The template of claim 1, wherein the pinning material comprises a polymer, said polymer comprising a repeat unit common to one of the blocks in the block copolymer to be coated on the template.

3. The template of claim 1, wherein the trenches are pitched at one or more selected pitch distances and where the one or more selected pitch distances separating the two or more trenches are chosen to be an approximately integral number of characteristic pitch distances in the block copolymer.

4. The template of claim 1, wherein the width of at least one of the trenches is a factor of about 0.1 to about 2.0 times the characteristic pitch of the selected pitch of the block copolymer.

5. The template of claim 1, wherein the pinning material has a molecular weight of ≤20,000 Da.

6. The template of claim 1, wherein said template is consisting of:

a. a substrate consisting of a base and a neutral coating on the base, said neutral coating having an array comprising two or more trenches etched therein; said trenches having walls and floors, and wherein said neutral coating, prior to trench etching is formed from functionalized polymer brushes, cross-linkable polymers, or random copolymers, or blends of homopolymers; and

b. a pinning material in the trenches, said pinning material having a greater affinity for one of the two or more spontaneously separating

blocks than for any other of the two or more spontaneously separating blocks, and

wherein the pinning material is coated on the walls and floors of the trenches and conforms to the walls of the trenches and the trenches are maintained, and wherein the widths of the trenches are dimensioned in a manner effective to direct a pattern by pinned chemoepitaxy in a block copolymer film that overlays both the neutral layer and the trenches, wherein the pinning material comprises a polymer comprising a repeat unit selected from a group consisting of substituted styrene, unsubstituted styrene, (meth)acrylate, substituted vinyl pyridine, unsubstituted vinyl pyridine, a diene, one or more olefins, an unsaturated anhydride, an unsaturated diacid, an unsaturated acid-ester, one or more olefin oxides, a siloxane, a homopolyester, a heteropolyester couple, a homopolyamide couple, a heteropolyamide couple or combinations thereof and further wherein the pinning material comprises a monofunctional or difunctional telechelic polymer, comprising a reactive end group selected from a group consisting of an alcohol group, an ester group, a carbonate group, a carboxylic acid group, a phosphonic acid group, a sulfonic acid group, an amine group, an amide or imide group, an epoxy group, a silyl group, an alkoxysilyl group, an alkylsilyl group, an aminosilane group, a nitrile group, an isocyanate group, a thiocyanate group, and an isothiocyanate group.

7. The template of claim 1, wherein the pinning material comprises a polymer comprising a repeat unit selected from a group consisting of substituted styrene, unsubstituted styrene, (meth)acrylate, substituted vinyl pyridine, unsubstituted vinyl pyridine, a diene, one or more olefins, an unsaturated anhydride, an unsaturated diacid, an unsaturated acid-ester, one or more olefin oxides, a siloxane, a homopolyester, a heteropolyester couple, a homopolyamide couple, or a heteropolyamide couple and further wherein the pinning material comprises a monofunctional or difunctional telechelic polymer, comprising a reactive end group selected from a group consisting of an alcohol group, an ester group, a carbonate group, a carboxylic acid group, a phosphonic acid group, a sulfonic acid group, an amine group, an amide or imide group, an epoxy group, a silyl

group, an alkoxysilyl group, an alkylsilyl group, an aminosilane group, a nitrile group, an isocyanate group, a thiocyanate group, and an isothiocyanate group.

8. The template of claim 1, wherein further said pinning layer material is a polymer whose repeat units are either a substituted styrene, an unsubstituted styrene, a (meth)acrylate, an substituted vinyl pyridine, or an unsubstituted vinyl pyridine and further wherein said pinning material is a monofunctional or difunctional telechelic polymer, comprising a reactive end group selected from a group consisting of an alcohol group, an ester group, a carbonate group, a carboxylic acid group, a phosphonic acid group, a sulfonic acid group, an amine group, an amide or imide group, an epoxy group, a silyl group, an alkoxysilyl group, an alkylsilyl group, an aminosilane group, a nitrile group, an isocyanate group, a thiocyanate group, and an isothiocyanate group.

9. The template of claim 1, wherein further said pinning layer material is a polymer whose repeat units are either a substituted styrene, an unsubstituted styrene, a (meth)acrylate, a substituted vinyl pyridine, or an unsubstituted vinyl pyridine and further wherein said pinning material is a monofunctional or difunctional telechelic polymer, comprising a reactive end group selected from a group consisting of an alcohol group, an ester group, a carbonate group, a carboxylic acid group, a phosphonic acid group, an epoxy group, a silyl group, an alkoxysilyl group, an alkylsilyl group, an aminosilane group, an isocyanate group, a thiocyanate group, and an isothiocyanate group.