What is claimed is:

1. A device comprising a thermotropic liquid crystalline polymer microneedle.

2. The device of claim 1, wherein the microneedle comprises mesogens that are molecularly aligned by an anisotropy factor in the range of from greater than 0.3 up to 1.0.

3. The device of claim 1 further comprising a base, wherein the microneedle is integral with and protrudes from the base, further wherein at least a portion of the mesogens are flow aligned.

4. The device of claim 3, wherein at least about 30% of the mesogens are flow aligned.

5. The device of claim 2, wherein at least about 10% of the mesogens are flow aligned, with the remainder of the mesogens having a relatively isotropic orientation state.

6. The device of claim 1 wherein the microneedle comprises a tip and a base, and wherein the microneedle has a bending moment as measured at 15% of the distance from the tip to the base of from 30,000 to 60,000 mN-μm.

7. The device of claim 1 wherein the microneedle comprises a tip and a base, and wherein the microneedle has a bending moment as measured at 60% of the distance from the tip to the base of from 85,000 to 105,000 mN-μm.

8. The device of claim 1 wherein the microneedle has a buckling force of from 0.2 to 0.5 N.

9. The device of claim 2 wherein the molecularly aligned mesogen-containing area of the microneedle has an elastic modulus of from 6 to 8 Gpa.

10. The device of claim 2 or 9, wherein the microneedle further comprises an area where the mesogens are substantially isotropic.

11. The device of claim 10 wherein the isotropic area has an elastic modulus of from 4 to 6 Gpa.

12. The device of claim 1, wherein the microneedle has a Hermans orientation function value of from 0.4 to 0.8.

13. The device of claim 1 wherein the thermotropic liquid crystalline polymer is a main chain thermotropic liquid crystalline polymer microneedle.

14. The device of claim 1 wherein the thermotropic liquid crystalline polymer is a main chain polyester thermotropic liquid crystalline polymer microneedle.

15. A device comprising an array of liquid crystalline polymer microneedles wherein the microneedles have a depth of penetration of from 50 to 120 microns using 2 pounds of force for 10 seconds.

16. A device comprising an array of liquid crystalline polymer microneedles wherein the microneedles have a depth of penetration of from 50 to 150 microns using 3 pounds of force for10 seconds.

17. A device comprising an array of liquid crystalline polymer microneedles wherein the microneedles have a penetration efficiency of 70% or higher using 3 pounds of force for 10 seconds.

CLAIMS

1. A device (10) comprising a thermotropic liquid crystalline polymer microneedle (100), wherein the microneedle (100) comprises a tip and a base, and wherein the microneedle (100) has a maximum sustained bending moment as measured at 15% of the distance from the tip to the base of from 30,000 to 60,000 mN-μm.

2. The device (10) of claim 1, wherein the microneedle (100) comprises mesogens that are molecularly aligned by an anisotropy factor in the range of from greater than 0.3 up to 1.0.

3. The device (10) of claim 1, further comprising a base, wherein the microneedle (100) is integral with and protrudes from the base, further wherein at least a portion of the mesogens are flow aligned.

4. The device (10) of claim 3, wherein at least about 30% of the mesogens are flow aligned.

5. The device (10) of claim 2, wherein at least about 10% of the mesogens are flow aligned, with the remainder of the mesogens having a relatively isotropic orientation state.

6. The device (10) of claim 1, wherein the microneedle (100) comprises a tip and a base, and wherein the microneedle has a maximum sustained bending moment as measured at 60% of the distance from the tip to the base of from 85,000 to 105,000 mN-μm.

7. The device (10) of claim 1, wherein the microneedle has a buckling force of from 0.2 to 0.5 N.

8. The device (10) of claim 2, wherein the molecularly aligned mesogen-containing area of the microneedle (100) has an elastic modulus of from 6 to 8 Gpa.

9. The device (10) of claim 2 or 8, wherein the microneedle (100) further comprises an area where the mesogens are substantially isotropic.

10. The device (10) of claim 9, wherein the isotropic area has an elastic modulus of from 4 to 6 Gpa.

11. The device (10) of claim 1, wherein the microneedle (100) has a Hermans orientation function value of from 0.4 to 0.8.

12. The device (10) of claim 1, wherein the thermotropic liquid crystalline polymer is a main chain thermotropic liquid crystalline polymer microneedle.

13. The device (10) of claim 1, wherein the thermotropic liquid crystalline polymer is a main chain polyester thermotropic liquid crystalline polymer microneedle.