CLAIMS

1. A method of functionalizing the surface of a microfluidic channel comprising the steps of:

(a) providing;

(i) an enclosed microfluidic channel comprising an unmodified surface;

(ii) a bifunctional crosslinker;

(iii) surface hydrophobicity modifying molecules;

(b) exposing at least a portion of the unmodified surface to the bifunctional crosslinker;

(c) activating the crosslinker under first conditions to create a crosslinked surface; and

(d) exposing the crosslinked surface to the surface hydrophobicity modifying molecules under second conditions to create a functionalized surface.

2. A method according to Claim 1, in which the enclosed microfluidic channel is a portion of a microfluidic device.

3. A method according to Claim 1, in which the enclosed microfluidic channel is serpentine.

4. A method according to Claim 1, in which the enclosed microfluidic channel further comprises a bubble.

5. A method according to Claim 4, further comprising the step of clearing the bubble from the enclosed microfluidic channel, in which functionalized channel surface improves the clearance of a bubble compared to the unmodified surface.

6. A method according to Claim 1, in which the crosslinker is photoactivatable.

7. A method according to Claim 6, in which the first conditions comprise exposing the crosslinker to light.

8. A method according to Claim 7, in which the exposure to light comprises rastering or pattern projection.

9. A method according to Claim 1, in which the activating of step (c) is done without added heat.

10. A method according to Claim 1, in which the surface hydrophobicity modifying molecules are selected from the group consisting of hydrophilic molecules and hydrophobic molecules.

11. A method according to Claim 10, in which the hydrophilic molecules are selected from the group consisting of PEG, TRIS, poly vinyl alcohol, and PLA.

12. A method according to Claim 10, in which the hydrophobic molecules are selected from the group consisting of alkanes, fluorocarbons, fluorinated polymers and nylon.

13. A method according to Claim 1, in which the crosslinker is selected from the group consisting of: ANB-NOS, Sulfo-SAND, SANPAH and Sulfo-SANPAH.

14. A method according to Claim 11, in which the PEG is an amine-terminated PEG.

15. A method according to Claim 1, further comprising step (e) seeding the microfluidic channel with cells.

16. A method according to Claim 15, in which the functionalized channel surface prevents cell attachment.

17. A method according to Claim 15, in which the functionalized channel surface promotes cell attachment.

18. A method according to Claim 15, in which the unmodified surface of step (a) comprises naturally occurring moieties selected from the group consisting of double bonds, C-H sites, N-H sites and nucleophiles.

19. A method according to Claim 18, in which the nucleophiles are selected from the group consisting of primary amines, alcohols, azide, amines and amides.

20. A method according to Claim 1, in which the steps are performed without opening the enclosed microfluidic channel.

21. A method according to Claim 1, further comprising the step of masking at least a region of the unmodified surface of the channel so as to create a masked portion and an unmasked portion.