**CLAIMS**

1. A method of culturing cells, comprising:

(a) providing

(i) a microfluidic device comprising first and second microfluidic channels separated by a membrane, the membrane comprising first and second surfaces,

(ii) viable lamina propria-derived cells and

(iii) viable gastrointestinal epithelial cells;

(b) introducing the lamina propria-derived cells and gastrointestinal epithelial cells into the microfluidic device so as to create a co-culture on the first surface of the membrane; and

(c) perfusing the co-culture with fluid under flow conditions to create a contiguous epithelial cell layer that covers the viable lamina propria-derived cells, the epithelial cell layer having barrier function.

2. A method according to Claim 1, in which the lamina propria-derived cells are human lamina propria-derived cells.

3. A method according to Claim 1, in which the fluid in step (c) comprises tissue-culture medium.

4. A method according to Claim 1, further comprising introducing endothelial cells on the bottom surface of the membrane.

5. A method according to Claim 1, in which the endothelial cells are introduced before step (c).

6. A method according to Claim 1, in which the lamina propria-derived cells and viable gastrointestinal epithelial cells are introduced in step (b) sequentially.

7. A method according to Claim 1, in which the lamina propria-derived cells were derived from inflamed gastrointestinal tissue.

8. A method according to Claim 1, in which the lamina propria-derived cells comprises cells derived from a site of an ulcer or injury.

9. A method according to Claim 1, in which the lamina propria-derived cells were obtained from a human with inflammatory colitis.

10. A method according to Claim 1, in which the lamina propria-derived cells cause weakened barrier function of the epithelial cell layer as compared to healthy lamina propria-derived cells.

11. A method according to Claim 1, further comprising measuring the barrier function.

12. A method of culturing cells, comprising:

(a) providing a microfluidic device comprising first and second microfluidic channels separated by a membrane, the membrane comprising a top surface and a bottom surface;

(b) seeding viable lamina propria-derived cells and viable gastrointestinal endothelial cells on the top surface and viable endothelial cells on the bottom surface so as to create seeded cells; and

(c) culturing the seeded cells in fluid under flow conditions to create a contiguous epithelial cell layer, the epithelial cell layer having barrier function.

13. A method according to Claim 12, in which the gastrointestinal endothelial cells comprise human gastrointestinal endothelial cells.

14. A method according to Claim 12, in which the gastrointestinal epithelial cells are selected from the group consisting of Caco-2 epithelial cells, primary small intestinal epithelial cells and primary large intestinal epithelial cells.

15. A method according to Claim 12, in which the lamina propria-derived cells comprise immune cells from healthy tissue.

16. A method according to Claim 12, in which the lamina propria-derived cells comprise immune cells from disease tissue.

17. A method according to Claim 12, further comprising a step after step (c) of sampling cytokines present in the fluid.

18. A method according to Claim 17, in which the cytokines are selected from the group consisting of interleukin-6 and interleukin-9.

19. A method according to Claim 12, further comprising adding an agent to the epithelial cells.

20. A method according to Claim 12, further comprising contacted the epithelial cell layer with a bacterial antigen.

21. A method according to Claim 20 in which the bacterial antigen is PAM2CSK4.

22. A method according to Claim 20, further comprising after contacting with the bacterial antigen, measuring barrier function of the epithelial cell layer.

23. A method according to Claim 19, further comprising detecting a response to the agent.

24. A method comprising: (a) providing a fluidic device comprising (i) a fluidic channel in contact with a semi-permeable membrane, (ii) first cells comprising intestinal epithelial cells, and (iii) second cells comprising primary patient-derived stromal cells; and (b) perfusing the fluidic device with fluid.

25. A method according to Claim 24, in which the primary stromal cells comprise biopsy-derived cells or lavage-derived cells.

26. A method according to Claim 24, in which the patient-derived cells are from a patient with an inflammatory disease of the intestines.

27. A method according to Claim 24, further comprising step (c) contacting the first cells, the second cells or both with a first agent.

28. A method according to Claim 27, further comprising step (d) detecting at least one response to the first agent.

29. A method according to Claim 28, in which the at least one response comprises modulation of the inflammation reaction.