CLAIMS:

1. A culture medium for expanding a population of adult epithelial stem cells, wherein said culture medium comprises:
   i. any one of Rspondin 1-4 and/or an Rspondin mimic; and
   ii. one or more TGF-beta inhibitor, which is an inhibitor of ALK5, ALK4 and/or ALK7 signalling.
2. A culture medium for expanding a population of adult epithelial stem cells, wherein said culture medium comprises:
   i. an Lgr5 agonist; and
   ii. one or more TGF-beta inhibitor, which is an inhibitor of ALK5, ALK4 and/or ALK7 signalling.
3. The culture medium of claim 1 or claim 2, wherein the one or more TGF-beta inhibitor binds to and reduces the activity of ALK5, ALK4 or ALK7.
4. The culture medium of any one of claims 1 to 3, wherein the one or more TGF-beta inhibitor is selected from the group consisting of
   A83-01, SB-431542, SB-505124, SB-525334, SD-208, LY-36494 and SJN-2511.
5. The culture medium of any one of the preceding claims, wherein the TGF-beta inhibitor is added at a concentration of between 1 nM and 100 μM, between 10 nM and 100 μM, between 100 nM and 10 μM, or approximately 1 μM, wherein the total concentration of the one or more inhibitor is between 10 nM and 100 μM, between 100 nM and 10 μM, or approximately 1 μM.
6. The culture medium of any one of the preceding claims, wherein the culture medium comprises one or more additional components selected from: a BMP inhibitor, a Wnt agonist, a receptor tyrosine kinase ligand, nicotinamide, a p38 inhibitor, a Rock inhibitor, gastrin, an activator of the prostaglandin signalling pathway and testosterone.
7. The culture medium of claim 6, wherein the culture medium is for culturing human intestinal stem cells, human small intestinal crypts or human colonic crypts and wherein the culture medium comprises: a basal medium; Rspondin-1, -2, -3 or -4; a TGF-beta inhibitor as defined in any one of claims 1 to 5; a BMP inhibitor; a Wnt agonist; EGF; a p38 inhibitor; gastrin and nicotinamide.
8. The culture medium of claim 6, wherein the culture medium is for culturing pancreatic stem cells, and wherein the culture medium comprises: a basal medium; Rspondin-1, 2-, -3 or -4; a TGF-beta inhibitor as defined in any one of claims 1 to 5; a BMP inhibitor; EGF; FGF10; and gastrin.
9. The culture medium of claim 8, further comprising exendin 4 and Wnt-3a.
10. The culture medium of claim 6, wherein the culture medium is for culturing prostate cells, and wherein the culture medium comprises: a basal medium; Rspondin-1, -2, -3 or -4; a TGF-beta inhibitor as defined in any one of claims 1 to 5; a BMP inhibitor; nicotinamide; EGF; and testosterone.
11. The culture medium of claim 10 further comprising Wnt-3a and FGF10.

12. The culture medium of claim 6, wherein the culture medium is for culturing gastric cells, and wherein the culture medium comprises: a basal medium; Rspondin-1, 2-, -3 or -4; a TGF-beta inhibitor as defined in any one of claims 1 to 5; a BMP inhibitor; Wnt-3a; EGF; gastrin; nicotinamide; and FGF10.
13. The culture medium of claim 12 further comprising a p38 inhibtior.
14. The culture medium according to any one of claims 7 to 13, wherein the culture medium is for culturing cancer cells, and wherein one or more of the following are excluded from the medium: Wnt-3a, EGF, Noggin, Rspondin, p38 inhibitor, nicotinamide, gastrin, FGF10 and HGF.
15. A composition comprising a culture medium according to any one of claims 1 to 14 and an extracellular matrix or a 3D matrix that mimics the extracellular matrix by its interaction with the cellular membrane proteins.
16. A hermetically-sealed vessel containing a culture medium or composition according to any one of the preceding claims.
17. Use of a culture medium according to any one of claims 1 to 14 for expanding an epithelial stem cell, population of epithelial stem cells, tissue fragment or organoid.
18. A method for expanding a single epithelial stem cell, a population of epithelial stem cells or a tissue fragment wherein the method comprises culturing the single epithelial stem cell or population of epithelial stem cells in a culture medium according to any one of claims 1 to 14.
19. A method according to claim 18, wherein the method comprises:
    providing an epithelial stem cell, a population of epithelial stem cells or an isolated tissue fragment;
    providing a culture medium according to any one of claims 1 to 14;
    contacting the epithelial stem cell or population of epithelial stem cells with the culture medium; and
    culturing the epithelial stem cell or population of epithelial stem cells under appropriate conditions.
20. A method according to claim 18 or 19, wherein the method comprises bringing the epithelial stem cell, the population of epithelial stem cells or the isolated tissue fragment and the culture medium into contact with an extracellular matrix or a 3D matrix that mimics the extracellular matrix by its interaction with the cellular membrane proteins.
21. A method according to any one of claims 18 to 20, wherein the method comprises:
    culturing the epithelial stem cell, population of epithelial stem cells or tissue fragment in a first expansion medium;
    continuing to culture the epithelial stem cell, population of epithelial stem cells or tissue fragments and replenishing the medium with a differentiation medium, wherein the differentiation medium does not comprise one or more of, the factors selected from: a TGF-beta inhibitor, a p38 inhibitor, nicotinamide and Wnt.

22. The method of any one of claims 18 to 21, wherein a Rock inhibitor is added to the culture medium for the first 1, 2, 3, 4, 5, 6 or 7 days.
23. The method of any one of claims 18 to 22, wherein the epithelial stem cell, population of epithelial stem cells or tissue fragment is from a human.
24. An organoid obtained by the method of any one of claims 18 to 23.
25. An organoid according to claim 24, wherein the organoid has been cultured for at least 3 months, at least 4 months, at least 5 months, at least 6 months, at least 7 months, at least 9 months, or at least 12 months or more.
26. An organoid according to claim 24 or 25, wherein the organoid or population of cells expands at a rate of at least 3 fold, at least 4 fold, at least 5 fold, at least 6 fold, at least 7 fold, at least 8 fold, at least 9 fold or at least 10 fold per week.
27. An organoid according to any one of claims 24 to 26 which is frozen and stored at below -5ºC, below -10ºC, below -20ºC, below -40ºC, below -60ºC, below -80ºC, below -100ºC, or below -150ºC, or at approximately -180ºC.
28. A composition comprising:
    i) one or more organoids or population of cells according to any one of claims 24 to 27; and
    ii) a culture medium according to any one of claims 1 to 14 and/or an extracellular matrix.
29. Use of an organoid according to any one of claims 24 to 27 or a composition according to claim 15 or claim 28 for drug screening, target validation, target discovery, toxicology, toxicology screens, or *ex vivo* cell/organ models.
30. An organoid according to any one of claims 24 to 27, or a composition according to claim 28, for use in regenerative medicine or personalized medicine.
31. An organoid according to claim 30, wherein the use comprises transplantation of said organoid or composition into a mammal.
32. A method for screening for a therapeutic or prophylactic drug or cosmetic, wherein the method comprises:
    culturing an organoid according to any one of claims 24 to 27, for example with a culture medium according to claims 1 to 14;
    exposing said organoid to one or a library of candidate molecules;
    evaluating said organoid for any effects including one or more of a reduction in or loss of cell proliferation, a morphological change and cell death; and
    identifying the candidate molecule that causes said effects as a potential drug or cosmetic.