methods. Firstly, it is widely known that cells cultured *in vitro* for long periods of time differentiate, which decreases the ability of the cells to proliferate and repair tissue *in vivo*. Secondly, the culturing of cells *in vitro* exposes the cells to foreign materials that may contain contaminating particles (such as viruses or bacteria) or chemicals. These contaminates, if not detected before implantation, have the potential to cause significant disease and morbidity. Further, the risk of the cells becoming contaminated increases with the length of time cells are cultured. Lastly, cells cultured on scaffolds rarely penetrate more than 500μm from the external surface due to lack of nutrients and oxygen. As such, despite efforts to encourage the formation of tissue architecture, full-thickness tissues cannot be formed *in vitro*.

Accordingly, there is a need in the art to identify better ways of utilising cells and scaffolds in the repair of tissues.

In the claims which follow and in the preceding description of the invention, except where the context requires otherwise due to express language or necessary implication, the word "comprise" or variations such as "comprises" or "comprising" is used in an inclusive sense, i.e. to specify the presence of the stated features but not to preclude the presence or addition of further features in various embodiments of the invention.

It is to be understood that, if any prior art publication is referred to herein, such reference does not constitute an admission that the publication forms a part of the common general knowledge in the art, in Australia or any other country.

SUMMARY

The inventors have developed a novel approach to the repair of tissues comprising the application of cells to an implantable support less than 2 hours before implantation.

Accordingly, in a first aspect the present invention provides a method of repairing tissue in a mammalian animal comprising the steps of: (a) providing an implantable support and a sample of cells; (b) applying said sample of cells to the support to produce an implantable matrix; and (c) implanting said matrix into the tissue to be repaired within 2 hours of the cells having been applied to the support.

CLAIMS

1. An *in vitro* produced implantable matrix produced by a method comprising the steps of:

(a) providing an implantable support and a sample of cells; and

(b) applying said sample of cells to the support to produce an implantable matrix;

wherein the cells are allowed to incubate for between 5 minutes to 1 hour 50 minutes before implantation.

21. ~~A method of~~ Use of an implantable support in the manufacture of a matrix for the repair~~ing~~ of tissue said matrix produced by a method comprising the steps of:

(a) providing an implantable support and a sample of cells;

(b) applying said sample of cells to the support to produce an implantable matrix; and

(c) implanting said matrix,

wherein the matrix is implanted ~~less than 2 hours~~ between 5 minutes to about 1 hour 50 minutes after the cells have been applied to the support.

32. A ~~method~~ matrix according to claim 1 or a use according to claim 2, wherein the tissue in need of repair is epithelium, connective tissue or muscle.

43. A ~~method~~ matrix according to claim 1 ~~or 2~~ or a use according to claim 2, wherein the tissue in need of repair is connective tissue.

54. A ~~method~~ matrix or use according to claim ~~2~~ 4, wherein the connective tissue is selected from the group consisting of cartilage, bone, or tendon.

65. A ~~method~~ matrix or use according to any one of claims 1 to ~~4~~ 5, wherein said cells are autologous or allogenic.

7~~6~~. A ~~method~~ matrix or use according to any one of claims 1 to 5, wherein said cells are chondrocytes.

8~~7~~. A ~~method~~ matrix or use according to any one of claims 1 to ~~6~~ 7, wherein said cells are isolated from a mammal.

9~~8~~. A ~~method~~ matrix or use according to claim ~~7~~ 8, wherein the mammal is selected from the group consisting of a sheep, a cow, a pig ~~or~~ and a human.

10~~9~~. A ~~method~~ matrix or use according to claims ~~7 or~~ 8, wherein the mammal is a human.

~~**10. A method according to any one of claims 1 to 9, wherein said cells are autologous.**~~

11. A ~~method~~ matrix or use according to any one of claims 1 to 10, wherein the implantable support comprises a membrane, a scaffold, a fleece, a thread, or a gel.

12. A ~~method~~ matrix or use according to any one of claims 1 to 11, wherein the implantable support comprises a collagen scaffold.

13. A ~~method~~ matrix or use according to any one of claims 1 to 12, wherein the matrix is implanted between ~~5~~ 15 minutes ~~to~~ and about 1 hour ~~50~~ 30 minutes after the cells have been applied to the support.

~~**14. A method according to any one of claims 1 to 13, wherein the matrix is implanted at least about 7 minutes after the cells have been applied to the support.**~~

~~**15. A method according to any one of claims 1 to 14, wherein the matrix is implanted at least about 15 minutes after the cells have been applied to the support.**~~

~~16. A method according to any one of claims 1 to 15, wherein the matrix is implanted between 15 minutes and about 1 hour 30 minutes after the cells have been applied to the support.~~

~~17. A method according to any one of claims 1 to 16, wherein the matrix is implanted at least about 20 minutes after the cells have been applied to the support.~~

14~~18~~. A ~~method~~ matrix or use according to any one of claims 1 to ~~17~~ 13, wherein the matrix is implanted between 30 minutes and about 1 hour and 10 minutes after the cells have been applied to the support.

15~~19~~. A ~~method~~ matrix or use according to any one of claims 1 to ~~18~~ 14, wherein the matrix is implanted about 40 minutes after the cells have been applied to the support.

16~~20~~. A ~~method~~ matrix or use according to any one of claims 1 to ~~19~~ 15, wherein the method comprises the further step of coating the matrix with a cell sealant prior to implantation.

17~~21~~. A ~~method~~ matrix or use according to claim ~~20~~ 16, wherein the cell sealant is a fibrin sealant.

18~~22~~. A ~~method~~ matrix or use according to any one of claims 1 to ~~21~~ 17, wherein the implantable support is heated to between 35°C and 37°C before the cells are applied.

~~23. A method of repairing tissue comprising the steps of:~~

~~(a) providing a collagen scaffold and a sample of cells comprising chondrocytes;~~

~~(b) heating the collagen scaffold to between~~

~~35°C and 37°C;~~

~~(c) applying said cells to the heated collagen scaffold to produce an implantable matrix;~~

~~(d) coating said matrix with a fibrin sealant;~~ ~~and~~

~~(e) implanting said matrix about 40 minutes after the cells have been applied to the collagen scaffold.~~

19~~24~~. A method of increasing the viability of cells for implantation comprising applying a sample of said cells to an implantable support to produce an implantable matrix; and implanting said matrix ~~less than 2 hours~~ within between 5 minutes to about 1 hour 50 minutes after the cells have been applied to the support.

20~~25~~. A method according to claim ~~24~~ 19, wherein the implanted cells have a viability of greater than 90%~~.~~,

~~26. A method according to claim 24 or 25, wherein the implanted cells have a viability of~~ preferably greater than 95%.

~~27. A method according to any one of claims 24 to 26, wherein the implanted cells have a viability of greater than 99%.~~

21~~28~~. A method according to ~~any one of claims 24 to 27~~ claim 19 or 20, wherein the cells have a lower expression of apoptosis indicators~~.~~,

~~29. A method according to claim 28, wherein the indicators of apoptosis are~~ preferably selected from the group consisting of MMP-1, MMP-9, MMP-13, ADAMTS-4, IL-1, c-fos, c-jun, Oct3/4 and Sox2.

2230. A kit ~~for use in repairing a tissue~~ when used in a method according to claim 2 comprising:

(a) an implantable support; and

(b) instructions for using the components of the kit, wherein the instructions advise applying a sample of cells to the implantable support ~~less than 2 hours~~ between 5 minutes and 1 hour and 50 minutes before implantation.

~~31. A kit according to claim 30, wherein the kit further comprises a sample of cells.~~

~~32. A kit according to claim 30 or 31, wherein the kit further comprises a cell sealant.~~