Not binding precedent of the Board.

Paper 88

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

NIKOLAI S. STRELCHENKO, JEFFREY M. BETTHAUSER,
GAIL L. JURGELLA, MARVIN M. PACE and MICHAEL D. BISHOP,
Junior Party,
(Application 09/357,445),
v.
UNIVERSITY OF MASSACHUSETTS,
Senior Party
(Patents 5,945,577 and 6,215,041 and 6,235,969).

Patent Interference 104,808

Before: SCHAFER, TORCZON and NAGUMO, Administrative Patent Judges.

SCHAFER, Administrative Patent Judge.

DECISION ON UNIVERSITY OF MASSACHUSETTS' PRELIMINARY MOTION NO. 1 AND FINAL JUDGMENT

The University of Massachusetts (Stice) has filed a preliminary motion seeking a judgment that all of Strelchenko's involved claims are barred by the provisions of 35 U.S.C. § 135(b)(1). Paper 23. An oral argument on the motion was held on March 10, 2003. We grant the motion and enter judgment against Strelchenko.

Findings of Fact

The following findings are supported by a preponderance of the evidence. Additional findings are made in the Analysis part of this opinion.

I. The parties

F 1. This interference is between Strelchenko Application 09/357,445 and Stice Patents 5,945,577; 6,215,041 and 6,235,969.

F 2. The real party-in-interest of the Strelchenko application is Infigen, Inc. Paper 8.

F 3. The real party-in-interest of the Stice patents is the University of Massachusetts. Paper 6.

II. The subject matter of the interference

F 4. The subject matter claimed by both parties relates to processes of cloning animals.

F 5. Both parties claim cloning processes which utilize nuclear transfer between a specified donor cell or the nucleus of the donor cell and an enucleated oocyte.

F 6. The parties' methods share a common goal: the ability to use virtually any animal cell, particularly non-embryonic cells, as the donor cell in the cloning process.

F 7. Strelchenko's written description states:

> The present invention provides multiple advantages over the tools and methods currently utilized in the field of mammalian cloning. Such features and advantages include:
>
> > (1) Production of cloned animals from virtually any type of cell. The invention provides materials and methods for reprogramming non-totipotent cells into totipotent cells. These non-totipotent cells may be of non-embryonic origin. This feature of the invention allows for the ability to assess the phenotype of an existing animal and then readily establish a permanent cell line for cloning that animal.

Strelchenko Application 09/357,445, Paper 1 (specification), p. 4, ll. 3-11.

F 8. Stice's written description also notes this advantage:

> By the present invention, there are potentially billions of fetal or adult cells that can be harvested and used in the cloning procedure. This will potentially result in many identical offspring in a short period.

Stice 577, col. 6, ll. 36-39.

F 9. In the method as claimed by Strelchenko, either a cell obtained from an ungulate fetus or a non-embryonic ungulate cell is cultured to form a cell culture. In one aspect the cultured cells must not be serum starved. Either a cell from the culture or the nucleus of such a cell is inserted into an enucleated oocyte of the same species as the cultured cell. Strelchenko

refers to the product so formed as a cybrid. The cybrid is cultured to form an embryo. The embryo is then implanted in the uterus of an ungulate animal of the same species as the original cultured cell to produce a fetus which develops into the ungulate animal.

F 10. Strelchenko's involved Claims 57 and 106 are representative of the interfering subject matter as claimed by Strelchenko:

> 57. A method for preparing an ungulate animal, said method comprising:
>
> a) obtaining a cell from an ungulate fetus;
>
> b) culturing said cell to form a cell culture;
>
> c) forming a cybrid by nuclear transfer of a cell obtained from said cell culture, or a nucleus thereof into an enucleated oocyte obtained from the same species as the cell in step (a); and
>
> d) culturing said cybrid so as to generate an embryo comprising embryonic cells; and
>
> e) transferring said embryo of step (d) or a recloned embryo of said embryo of step (d) into the uterus of an ungulate of the same species as the cell in step (a) so as to produce a fetus that undergoes full fetal development and parturition to generate said ungulate animal.
>
> 106. A method for preparing an ungulate animal, said method comprising:
>
> a) obtaining a non-embryonic cell from an ungulate;
>
> b) culturing said non-embryonic cell to form a cell culture, wherein said cell culture is not serum starved;
>
> c) forming a cybrid by nuclear transfer of a cell obtained from said cell culture, or a nucleus thereof into an enucleated oocyte obtained from the same species as the cell in step (a);
>
> d) culturing said cybrid so as to generate an embryo comprising embryonic cells; and
>
> e) transferring said embryo of step (d) or a recloned embryo of said embryo of step (d) into the uterus of an ungulate of the same species as the cell in step (a) so as to produce a fetus that undergoes full fetal development and parturition to generate said ungulate animal.

Paper 10, pp. 2 and 4-5.

F 11. In the method as claimed in Stice 577, a donor cell or the nucleus from a donor cell is inserted into an enucleated oocyte. Stice refers to the product as a nuclear transfer unit. The unit is implanted in the uterus of an animal of the same species and develops into a clone.

F 12. All of Stice's involved claims specify that the donor cell is a "proliferating somatic cell which has been expanded in culture."

F 13. Stice's Claim 1 is representative of the interfering subject matter as claimed by Stice:

> 1. An improved method of cloning a non-human mammal by nuclear transfer comprising
>
> the introduction of a non-human mammalian donor cell or a non-human mammalian donor cell nucleus into a non-human mammalian enucleated oocyte of the same species as the donor cell or donor cell nucleus to form a nuclear transfer (NT) unit,
>
> implantation of the NT unit into the uterus of a surrogate mother of said species, and
>
> permitting the NT unit to develop into the cloned mammal,
>
> wherein the improvement comprises using as the donor cell or donor cell nucleus a proliferating somatic cell that has been expanded in culture, or a nucleus isolated from said somatic cell.

Paper 7, Appendix (unpaginated) (emphasis added).

III. Preliminaries to the interference

A. Prosecution of Stice Application 08/781,752

F 14. Stice Application 08/781,752 was filed on January 10, 1997. Application 08/781,752, Paper 1, p. 1.

F 15. As originally filed the application included 77 claims, all of which required the use of a differentiated cell as a donor material for nuclear transfer. Application 08/781,752, Paper 1, pp. 48-61.

F 16. None of Stice's original claims included the limitation requiring the use of a "proliferating somatic cell that has expanded in culture" as the donor cell material for nuclear transfer. Application 08/781,752, Paper 1, pp. 48-61.

F 17. Stice's claims were twice subject to rejections on a variety of grounds including unpatentability over prior art. Application 08/781,752, Paper 6, pp. 2-9 and Paper 8, pp. 2-14.

F 18. Stice filed responses which included cancelling all the claims and submitting new claims 80-102. Application 08/781,752, Paper 12, pp. 1-6.

F 19. Some of Stice's new claims were in Jepson format and all the claims limited the donor cell to a somatic cell or cell committed to a somatic cell lineage. Application 08/781,752, Paper 12, pp. 1-6.

F 20. The examiner allowed claims after further amendment, by examiner's amendment, cancelling all claims and adding claims that require that the donor cell be "a proliferating somatic cell that has been expanded in culture." Application 08/781,752, Paper 15, pp. 1-6.

F 21. The Stice 577 patent issued with claims essentially as amended by the examiner on August 31, 1999.

B. Prosecution of Strelchenko Application 09/357,445.

F 22. During the prosecution of the Strelchenko application, on November 16, 2000, Strelchenko filed a paper cancelling and amending claims and requesting an interference with the Stice 577 patent. Application 09/357,445, Paper 10.

F 23. After rejection by the examiner and further action by Strelchenko, the examiner indicated that the claims were allowable and suspended prosecution "due to a potential interference." Application 09/357,445, Paper 14, p. 2, mailed June 4, 2001.

F 24. Prosecution was again suspended by the Technology Center 1600 Interference Practice Specialist on December 31, 2001. Application 09/357,445, Paper 17.

F 25. Strelchenko subsequently requested that an interference also be declared with the Stice 041 and 969 patents. Application 09/357,445, Paper 18, mailed November 25, 2001, and received by the Office on January 24, 2002.

F 26. This interference was declared on February 20, 2002.

IV. Stice Preliminary Motion No. 1

F 27. Stice filed Preliminary Motion No. 1 asserting that all of Strelchenko's involved claims were barred by 35 U.S.C. § 135(b)(1). Paper 23.

F 28. Strelchenko's involved Claims are 57-58, 61-63, 69-88, 106, 112-115 and 118, all of the claims currently pending in the Strelchenko application. Paper 1, pp. 7-15.

F 29. Stice asserts that all of Strelchenko's involved claims were barred because they were made more than a year after the issuance of the Stice 577 patent. Paper 23, p. 13.

F 30. Stice 577 issued August 31, 1999.

F 31. The critical date under § 135(b)(1) for the Stice 577 patent is August 31, 2000.

F 32. All of Strelchenko's involved claims were made on or after September 29, 2000.

F 33. All of Strelchenko's involved claims were made more than a year after Stice 577 issued.

F 34. Strelchenko filed an opposition to Stice Preliminary Motion No. 1. Paper 50.

F 35. Strelchenko's opposition identified three claims said to have been made prior to the critical date of September 1, 2000, which were asserted to be directed to the same or substantially the same subject matter as the claims of the Stice 577 patent. Paper 50, pp. 17-25.

F 36. Strelchenko specifically relies on Claims 48, 106 and 107, as those claims existed in Strelchenko's involved application on July 20, 1999, as being directed to the same or substantially the same subject matter as claimed in Stice 577. Paper 50, p. 18.

F 37. Strelchenko argues that notwithstanding a difference in claim language as to the donor cell, Strelchenko's precritical date claims 48, 106 and 107 and the Stice 577 claims are directed to the "same or substantially the same subject matter." Paper 50, p. 18.

A. Strelchenko's precritical date claims

F 38. Strelchenko's Claim 48 was an original claim in Strelchenko's involved application, when that application was filed on July 20, 1999. Strelchenko Application 09/357,445, Paper 1 (specification), p. 96.

F 39. Claim 48 was cancelled by a preliminary amendment filed with the application on July 20, 1999. Strelchenko Application 09/357,445, Paper 2, p. 1.

F 40. Strelchenko Claims 106 and 107 were added by a preliminary amendment filed with the filing of the 09/357,445 on July 20, 1999. Strelchenko Application 09/357,445, Paper 2, p. 7.

F 41. After multiple amendments, Strelchenko claim 106 was determined to be patentable by the examiner as involved Strelchenko Claim 106. Strelchenko claim 107 was cancelled by an amendment filed October 4, 2000. Strelchenko Application 09/357, 445, Paper filed October

4, 2000 (designated as Paper 5, but listed as Paper 6 in the application contents), pp. 1 and 3; Paper 10, p. 2.

F 42. Strelchenko Claim 48, original Claim 106 and Claim 107 were made prior to the critical date of August 31, 2000.

F 43. Strelchenko Claims 48, 106 and 107 each require nuclear transfer between a totipotent cell and an enucleated oocyte.

F 44. Strelchenko Claim 48 required using a totipotent cell as the donor material in nuclear transfer:

> 48. A method for preparing a cloned mammalian embryo, comprising the step of a nuclear transfer between:
> (a) a totipotent mammalian cell, wherein said cell is cultured and wherein said cell is not serum starved; and
> (b) an oocyte, wherein said oocyte is at a stage allowing formation of said embryo.

Strelchenko Application 09/357,445, Paper 1, specification, p. 96 (emphasis added).

F 45. Strelchenko Claims 106 and 107 also required use of a totipotent cell but further required that the totipotent cell be formed by reprogramming a non-embryonic cell:[1]

> 106. A method for cloning an animal, comprising the steps of:
> (a) obtaining a non-embryonic cell from an animal;
> (b) reprogramming said non-embryonic cell to form a reprogrammed cell, wherein said reprogrammed cell is totipotent;
> (c) forming a cybrid by nuclear transfer of said reprogrammed cell into an enucleated oocyte; and
> (d) culturing said cybrid so as to generate an embryo comprising embryonic cells; and
> (e) transferring said embryo of step (d) or a recloned embryo of said embryo of step (d) into the uterus of a host animal for developing said animal.

[1] Strelchenko's reproduction of Claim 106 on pages 21-22 Strelchenko's opposition (Paper 50) is not correct. The copy in the text above is the claim as it appears in the preliminary amendment filed July 20, 2000. Application 09/357,445, Paper 2, p. 7.

107. The method of claim [106], wherein said cells are reprogrammed by cultivation in a culture medium.[2]

Strelchenko Application 09/357,445, Paper 2, p. 7.

B. Comparison of Strelchenko's precritical date claims and the Stice 577 claims

F 46. Stice's 557 claims specify that the donor cell is "a proliferating somatic cell which has been expanded in culture." Paper 7, Appendix (unpaginated).

F 47. Strelchenko's precritical date claims 48, 106 and 107 specify that the donor cell is a totipotent cell. Strelchenko Application 09/357,445, Paper 1 (specification), p. 96; Paper 2, p. 7.

F 48. Thus, the Stice 577 claims and Strelchenko Claims 48, 106 and 107 differ in naming the cell used as the donor cell in nuclear transfer.

1. "Totipotent cells"

F 49. The meaning of totipotency to a person having ordinary skill in the art is the ability or capacity of certain cells to differentiate into any type of cell and thus form a new organism or regenerate any part of an organism; e.g., a fertilized ovum, or a small excised portion of a Planaria, which is capable of regenerating a complete new organism.[3]

F 50. Strelchenko's specification expressly defines "totipotent" as follows:

> The term "totipotent" as used herein refers to a cell that gives rise to all of the cells in a developing cell mass, such as an embryo, fetus, and animal. In preferred embodiments, the term "totipotent" also refers to a cell that gives rise to all of the cells in an animal. A totipotent cell can give rise to all of the cells of a developing cell mass when it is utilized in a procedure for creating an embryo from one or more nuclear transfer steps. An animal may be an animal that functions ex utero. An animal can exist, for example, as a live born animal. Totipotent cells may also be used to generate incomplete animals such as those useful for organ harvesting, e.g., having

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[2] Strelchenko Claim 107 as it appears in the preliminary amendment filed July 20, 2000, actually depends on Claim 50, a claim which was cancelled by the very amendment which added Claims 106 and 107. Strelchenko characterizes the reference to Claim 50 as a typographical error and says that Claim 107 should have been dependant upon Claim 106. Paper 50, p. 11, ¶ 102, n.2. For the purpose of this decision only, we adopt that characterization.

[3] Stedman's Medical Dictionary, 27th Ed., Lippincott Williams & Wilkins, Philadelphia, 2000; King et al., A Dictionary of Genetics, Oxford University Press, New York, 1997; Paper 20, p. 8.

genetic modifications to eliminate growth of a head such as by manipulation of a homeotic gene.

Strelchenko Application 09/357,445, Paper 1 (specification), p. 6, ll. 1-10.

F 51. Strelchenko's specification also distinguishes totipotent cells from pluripotent cells which are differentiated and therefore do not have the ability to differentiate to form all the cells of the animal:

> The term "totipotent" as used herein is to be distinguished from the term "pluripotent." The latter term refers to a cell that differentiates into a sub-population of cells within a developing cell mass, but is a cell that may not give rise to all of the cells in that developing cell mass. Thus, the term "pluripotent" can refer to a cell that cannot give rise to all of the cells in a live born animal.

Strelchenko Application 09/357,445, Paper 1 (specification), pp. 6, l. 27 - p. 7, l. 2.

F 52. The ordinary meaning of "differentiation," as applied to organism development, refers to the process in which descendent cells develop and maintain specialization of structure and function not present in the ancestor cells. It is the process by which cells of an organism, which begin as totipotent or unspecialized cells, become, through growth and cell division, more specialized in structure and function and ultimately develop into the various cells, tissues or organs of the mature animal [4]

F 53. Strelchenko also defines "differentiated cell," consistently with the ordinary meaning of the phrase:

> The term "differentiated cell" as used herein refers to a precursor cell that has developed from an unspecialized phenotype to that of a specialized phenotype. For example, embryonic cells can differentiate into an epithelial cell lining the intestine. It is highly unlikely that differentiated cells revert into their precursor cells in vivo or in vitro. However, materials and methods of the invention can reprogram differentiated cells into immortalized, totipotent cells. Differentiated cells can be isolated from a fetus or a live born animal, for example.

Strelchenko Application 09/357,445, Paper 1 (specification), p. 17, ll. 17-23.

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[4] King et al, A Dictionary of Genetics, Oxford University Press, New York, 1997; Oxford Dictionary of Biochemistry and Molecular Biology, Oxford University Press, New York, 1997; Paper 20, p. 3.

F 54. According to Strelchenko's written description, the conversion of non-totipotent cells to totipotent cells prior to their use as donor cells is an important aspect of Strelchenko's process and allows virtually any cell to be used as a donor cell. Strelchenko Application 09/357,445, Paper 1 (specification), p. 12, ll. 3-11 and p. 17, l. 28 - p. 18, l. 2.

F 55. According to Strelchenko a non-totipotent cell may be converted to a totipotent cell using "features of the invention:"

> a non-totipotent precursor cell can be converted into a totipotent cell by utilizing features of the invention described hereafter.

Strelchenko Application 09/357,445, Paper 1 (specification), p. 12, ll. 11-12.

F 56. Strelchenko calls this conversion of non-totipotent to totipotent cells "reprogramming:"

> This conversion process can be referred to as a reprogramming step.

Strelchenko Application 09/357,445, Paper 1 (specification), p. 12, l. 13.

F 57. Strelchenko's specification further describes reprogramming:

> The term "reprogramming" or "reprogrammed" as used herein refers to materials and methods that can convert a non-totipotent cell into an totipotent cell.

Strelchenko Application 09/357,445, Paper 1 (specification), p. 12, ll. 17-18.

F 58. The reprogramming of non-embryonic cells to make them totipotent is said to be a unique feature of Strelchenko's invention:

> A unique feature of the present invention is that immortalized, totipotent cells are reprogrammed from non-embryonic cells by utilizing the materials and methods described herein in descriptions of the preferred embodiments and exemplary embodiments.

Strelchenko Application 09/357,445, Paper 1 (specification), p. 17, l. 28 - p. 18, l. 2.

F 59. Strelchenko further emphasizes the importance of reprogramming in allowing cloning to be carried out from virtually any type of "precursor" cell:

> One advantage provided by the materials and methods defined herein is the ability to create an immortalized and totipotent cell from virtually any type of precursor cell. These precursor cells can be embryonic cells, cultured embryonic cells, primordial germ cells, fetal cells, and cells isolated from the tissues of adult animals, for example. Cells isolated from the kidney and ear of an adult grown bovine have been utilized as precursor cells for the generation of immortalized, totipotent cells.

Strelchenko Application 09/357,445, Paper 1 (specification), p. 73, ll. 22-28.

F 60. Strelchenko specifically describes treatments for reprogramming these non-totipotent cells:

> An example of materials and methods for converting non-totipotent cells into totipotent cells is to incubate precursor cells with a receptor ligand cocktail. Receptor ligand cocktails are described hereafter.

Strelchenko Application 09/357,445, Paper 1 (specification), p. 12, ll. 20-22.

F 61. Strelchenko refers to the materials and methods used to convert or reprogram non-totipotent "precursor"cells to totipotent cells as "stimulus:"

> The term "stimulus" as used herein refers to materials and/or methods useful for converting precursor cells into immortalized and/or totipotent cells. The stimulus can be electrical, mechanical, temperature-related, and/or chemical, for example. The stimulus may be a combination of one or more different types of stimuli. As described herein in exemplary embodiments, placing precursor cells in culture can be a sufficient stimulus to convert precursor cells into immortalized and/or totipotent cells. A stimulus can be introduced to precursor cells for any period of time that accomplishes the conversion of precursor cells into immortalized and/or totipotent cells.

Strelchenko Application 09/357,445, Paper 1 (specification), p. 28, ll. 6-14.

F 62. Strelchenko specifically notes that the non-embryonic precursor cells which may be converted into totipotent cells includes differentiated cells such as somatic cells:

> The term "non-embryonic cell" as used herein refers to a cell that is not isolated from an embryo. Non-embryonic cells can be differentiated or nondifferentiated. Non-embryonic cells can refer to nearly any somatic cell, such as cells isolated from an ex utero animal.

Strelchenko Application 09/357,445, Paper 1 (specification), p. 12, ll. 27-30.

F 63. Strelchenko's specification also provides additional information relating to the formation of totipotent cells from "precursor" cells:

> In preferred embodiments, (1) the totipotent cells are not alkaline phosphatase positive; (2) the totipotent cells arise from at least one precursor cell; (3) the precursor cell is isolated from and/or arises from any region of an animal; (4) the precursor cell is isolated from and/or arises from any cell in culture; (5) the precursor cell is selected from the group consisting of a non-embryonic cell, a non-fetal cell, a differentiated cell, a somatic cell, an embryonic cell, a fetal cell, an embryonic stem cell, a primordial germ cell, a genital ridge cell, an amniotic cell, a fetal fibroblast cell, an ovarian follicular cell, a cumulus cell, an hepatic cell, an endocrine cell, an

> endothelial cell, an epidermal cell, an epithelial cell, a fibroblast cell, a hematopoietic cell, a keratinocyte, a renal cell, a lymphocyte, a melanocyte, a muscle cell, a myeloid cell, a neuronal cell, an osteoblast, a mesenchymal cell, a mesodermal cell, an adherent cell, a cell isolated from an asynchronous population of cells, and a cell isolated from a synchronized population of cells where the synchronous population is not arrested in the G_o stage of the cell cycle; and (6) the precursor cell is preferably isolated and/or arises from a mammalian animal, more preferably an ungulate animal, and most preferably a bovine animal.

Strelchenko Application 09/357,445, Paper 1 (specification), p. 10, l. 29 - p. 11, l. 14 (emphasis added).

F 64. A totipotent cell in both its ordinary meaning and as used in Strelchenko's specification does not encompass, cover or mean a differentiated cell or a somatic cell. F49-F63.

2. "<u>Proliferating somatic cell that has been expanded in culture</u>"

F 65. Stice's 557 claims specify that the donor cell is "a proliferating somatic cell which has been expanded in culture." Paper 7, Appendix (unpaginated).

F 66. The phrase "proliferating somatic cell that has been expanded in culture" appears only in Stice's claims and does not appear, in haec verba, in Stice's written description.

F 67. Stice's written description does not provide definitions of "proliferating," "somatic," or "expanded in culture."

F 68. The ordinary meaning of a proliferating cell is a cell that is in the process of growth and reproduction.[5]

F 69. The examiner of the application that became the Stice 577 patent expressly indicated her understanding of the meaning of "proliferating cells" in the examiner's amendment:

> Proliferating cells are non-quiescent cells and are in cell cycle stage M, G_1, S or G_2.

Stice Application 08/781,752, Paper 15, p. 6.

F 70. M, G_1, S or G_2 are the four parts of the standard eucaryotic cell growth and division cycle. M represents the mitotic phase where nuclear division occurs and the cell divides. The G_1 phase is the growth phase between the M phase and the beginning of the S phase. In the S

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[5] Stedman's Medical Dictionary, 27th Ed., Lippincott Williams & Wilkins, 2000.

or synthesis phase, the cell's DNA is replicated. The G_2 phase is the growth phase between the end of S phase and the M phase.[6]

F 71. The examiner's understanding is consistent with the ordinary meaning of "proliferating cells."

F 72. In short, a proliferating cell is a cell which is actively growing and dividing.

F 73. A cell that is expanded in culture is a cell which has been grown and has multiplied (undergone cell division) in vitro.

F 74. The ordinary meaning of "somatic cell" is any body cell other than a germ cell or germ cell precursor, i.e., a cell which will develop through differentiation into a germ cell.[7]

F 75. Germ cells are also called gametes or sex cells. They are the sperm and ovum.[8]

F 76. In its ordinary meaning a somatic cell is a differentiated cell.

F 77. Since a totipotent cell may develop through differentiation into any cell, including a germ cell, a totipotent cell is a germ cell precursor and is not a somatic cell. Put another way, in its ordinary meaning, a totipotent cell is a non-differentiated cell, and hence is not a somatic cell.

F 78. According to Stice's written description, an important aspect of the process claimed in Stice 577 is the use of differentiated cells as the donor material in cloning.

F 79. Stice 577 notes that it is the use of differentiated donor cells which distinguishes the Stice 577 invention from the prior art:

> Prior art methods have used embryonic cell types in cloning procedures. This includes work by Campbell et al (Nature, 380:64-68, 1996) and Stice et al (Biol. Reprod., 54:100-110, 1996). In both of those studies, embryonic cell lines were derived from embryos of less than 10 days of gestation. In both studies, the cells were maintained on a feeder layer to

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[6] Alperts et al., The Molecular Biology of the Cell, 3rd Ed. Garland Pub., Inc., N.Y. & London, 1994, pp. 864-66.

[7] Alperts et al., Molecular Biology of the Cell, Garland Publishing Co., N.Y. & London, 1994, pp. 1012 and G-21; King et al., A Dictionary of Genetics, Oxford University Press, N.Y., 1997, p. 318. Contra, Joint Glossary, Paper 20, p. 8.

[8] Stedman's Medical Dictionary, 27th Ed., Lippincott Williams & Wilkins, 2000.

> prevent overt differentiation of the donor cell to be used in the cloning procedure. The present invention uses differentiated cells.
>
> It was unexpected that cloned embryos with differentiated donor nuclei could develop to advanced embryonic and fetal stages. The scientific dogma has been that only embryonic or undifferentiated cell types could direct this type of development. It was unexpected that a large number of cloned embryos could be produced from these differentiated cell types. Also, the fact that new transgenic embryonic cell lines could be readily derived from transgenic cloned embryos was unexpected.

Stice 577, col. 6, ll. 12-30 (emphasis added).

F 80. Stice 577 emphasizes that in the Stice cloning process differentiated cells are inserted into the oocyte:

> It is a more specific object of the invention to provide a novel method for cloning mammalian cells which involves transplantation of the nucleus of a differentiated mammalian cell into an enucleated oocyte of the same species.

Strelchenko Ex. 2001, col. 3, l. 66 - col. 4, l. 2.

F 81. As used in the Stice 577 specification, "somatic cells" are differentiated cells.

F 82. The Stice 577 patent does not describe reprogramming donor cells to make them totipotent before insertion into the enucleated oocyte.

F 83. Stice 577 describes a method in which differentiated cells are used as the donor material without reprogramming.

ANALYSIS

The University of Massachusetts has filed a motion for judgment under 37 CFR § 1.633(a) asserting that Strelchenko's involved claims are barred by 35 U.S.C. § 135(b)(1). Strelchenko opposes. In opposing the motion, Strelchenko has not argued that Strelchenko's involved claims are not directed to the same or substantially the same subject matter as the claims of the Stice 577 patent. In addition, neither party has filed a motion asserting that no interference-in-fact exists between the parties' involved claims.

I.

All of Strelchenko's involved claims were made after August 31, 2000, more than a year after Stice 577 issued on August 31, 1999.[9] Thus, applying the express language of 35 U.S.C. § 135(b)(1), Strelchenko's Claims 57-58, 61-63, 69-88, 106, 112-115 and 118 would appear to be barred. However, under the jurisprudence interpreting § 135(b), Strelchenko's claims are not barred if Strelchenko had on file at least one claim which was directed to the same or substantially same subject matter as claimed by the patentee prior to the critical date. See, e.g., Corbett v. Chisholm, 568 F.2d 759, 759-60, 196 USPQ 337, 338 (CCPA 1977) ("The issue, therefore, is whether the board was correct in holding that Corbett was not claiming subject matter substantially the same as that covered by the copied claims prior to January 19, 1972, i.e., within the year after Chisholm's patent issued"). We focus, therefore, on the claims Strelchenko had pending prior to the critical date of August 31, 2000. Strelchenko specifically relies on three such claims: cancelled claim 48, an earlier version of involved claim 106 and cancelled claim 107. Paper 50, p. 18. If Strelchenko's precritical date claims include all the material limitations of Stice's' patent claims, then Strelchenko is entitled to rely on the earlier filing date for the purpose of the § 135(b)(1) analysis. In re Berger, 279 F.3d 975, 982, 61 USPQ2d 1523, 1527 (Fed. Cir. 2002). A limitation is material if it is necessary to patentability. Corbett, 568 F.2d at 765, 196 USPQ at 343.

The Stice 577 claims and Strelchenko's precritical date claims are directed to cloning processes including the step of inserting a specified donor cell or the nucleus of the donor cell into an enucleated oocyte. In the Stice 577 claims the donor cell is a "proliferating somatic cell which has been expanded in culture." In Strelchenko's precritical date claims the donor cell is a "totipotent cell." Thus, Stice's Claim 1 provides:

> 1. An improved method of cloning a non-human mammal by nuclear transfer comprising
>
> the introduction of a non-human mammalian donor cell or a non-human mammalian donor cell nucleus into a

[9] Strelchenko's involved claims were made prior to the issue date of the Stice 041 and 969 Patents. Thus only Stice 577 is relevant to this motion.

non-human mammalian enucleated oocyte of the same species as the donor cell or donor cell nucleus to form a nuclear transfer (NT) unit,

implantation of the NT unit into the uterus of a surrogate mother of said species, and

permitting the NT unit to develop into the cloned mammal,

wherein the improvement comprises using as the donor cell or donor cell nucleus a proliferating somatic cell that has been expanded in culture, or a nucleus isolated from said somatic cell.

Paper 7, Appendix (unpaginated, emphasis added). Strelchenko's precritical date Claim 48 provides:

48. A method for preparing a cloned mammalian embryo, comprising the step of a nuclear transfer between:

(a) a totipotent mammalian cell, wherein said cell is cultured and wherein said cell is not serum starved; and

(b) an oocyte, wherein said oocyte is at a stage allowing formation of said embryo.

Strelchenko Application 09/357,445, Paper 1, specification, p. 96 (emphasis added).

The key difference in language between the processes set out in the parties' respective claims is the use in a nuclear transfer process of "a proliferating somatic cell that has been expanded in culture" and the use of a totipotent cell which is cultured and which is not serum starved.

II.

The first question we address is whether "a proliferating somatic cell that has been expanded in culture" is a material limitation. The limitation appears in all of Stice's involved claims. We hold that the limitation is material.

A.

The record of the Stice application shows that the limitation relating to proliferating somatic cells expanded in culture was necessary for allowance of those claims. Stice's original claims did not include the proliferating somatic cell limitation. Stice's claims were directed broadly to the use of differentiated cells as the donor cells in cloning. Stice Application 08/781,752, Paper 1 (specification), pp. 48-61. The claims were subject to rejection on a variety of grounds including unpatentability over prior art. Stice Application 08/781,752, Paper 6, pp. 2-9 and Paper 8, pp. 2-14. Stice responded by cancelling all claims and presented new narrower claims, some in Jepson format, limited to using "a somatic cell or cell committed to a somatic cell lineage capable of division."

Stice Application 08/781,752, Paper 12, pp. 1-6. However, the examiner did not allow those claims as amended. Rather, she allowed claims only after further amendment, by examiner's amendment, adding the requirement that the donor cell be "a proliferating somatic cell that has been expanded in culture." Stice Application 08/781,752, Paper 15, pp. 1-6.

This prosecution history provides strong support for holding that the "proliferating somatic cell" limitation was necessary for the patentability of the Stice claims and is therefore a material limitation. A limitation is material if it is necessary to patentability. Corbett, 568 F.2d at 765, 196 USPQ at 343.

B.

The form of Stice's claims themselves also indicates the importance of this limitation to patentability. Stice independent claims 1-5 and the claims dependent thereon are presented using the "Jepson" format.[10] A Jepson claim is a claim to the invention described in the preamble in combination with an improvement. Pentec, Inc. v. Graphic Controls Corp., 776 F.2d 309, 315, 227 USPQ 766, 770 (Fed. Cir. 1985). Reciting matter in the preamble up to a phrase such as "the improvement wherein" is an implied admission that the subject matter of the preamble is conventional or old in the art if the work is not that of the inventor. Sjolund v. Musland, 847 F.2d 1573, 1576-77, 6 USPQ2d 2020, 2023 (Fed. Cir. 1988). Neither Stice nor Strelchenko have challenged the presumption that the subject matter of the preamble constitutes an admission. Nor have the parties directed us to anything in the record or provided an explanation which would provide a basis for concluding that the use of the Jepson format is not an admission that the preamble of Stice's 577 claims is prior art. See e.g., In re Ehrreich, 590 F.2d 902, 909-910, 200 USPQ 504, 510 (CCPA 1979) (holding that facts of record provided a basis for holding that the preamble was not an admission).

Stice's Claim 1, for example, claims an improved method of cloning reciting several steps in the preamble. Thus, all those steps are presumptively old or conventional in the art. The sole step following the phrase "the improvement comprising" is the use of a proliferating somatic cell which

[10] Stice independent Claim 6 and its dependent claims are not presented in Jepson format but similarly require the use of "a proliferating somatic cell which has been expanded in culture."

has been expanded in culture as the donor cell.[11] Thus, Stice's claims 1-5 and the claims dependent thereon rely solely on "a proliferating somatic cell that has been expanded in culture" to impart patentability to the claims.

The Jepson format of the claims supports a holding that the proliferating somatic cell limitation is material.

C.

Strelchenko argues that the use of proliferating somatic cells expanded in culture is not a material limitation because the use of proliferating somatic cells was old in the art:

> In short, use of proliferating somatic cells, as defined in this interference, was known years prior to the filing of the application for the Stice '577 patent; what was new, if anything, was the use of cells that were cultured.

Paper 50, p. 19.

The fact that the use of proliferating somatic cells may have been known in the art is not dispositive. The limitation is "a proliferating somatic cell that has been expanded in culture." This requires that the cell used be both proliferating, i.e., undergoing active growth, and have been expanded in culture, i.e. the cells have multiplied in vitro. Strelchenko does not assert that the use of donor cells that are both proliferating and have been expanded in culture are part of the prior art. Indeed, Strelchenko's statement about Stice's claims that "what was new, if anything, was the use of cells that were cultured" (Paper 50, p. 19) is consistent with the examiner's allowance of the claims amended to require the use of cells that are both proliferating and have been expanded in culture.

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[11] Stice's Claim 1 provides:

1. An improved method of cloning a non-human mammal by nuclear transfer comprising
   the introduction of a non-human mammalian donor cell or
   a non-human mammalian donor cell nucleus into a non-human mammalian enucleated oocyte of the same species as the donor cell or donor cell nucleus to form a nuclear transfer (NT) unit,
   implantation of the NT unit into the uterus of a surrogate mother of said species, and
   permitting the NT unit to develop into the cloned mammal,
   wherein the improvement comprises using as the donor cell or donor cell nucleus a proliferating somatic cell that has been expanded in culture, or a nucleus isolated from said somatic cell.

Thus, we hold that the limitation in Stice's claims requiring "a proliferating somatic cell that has been expanded in culture" was necessary to the patentability of Stice's claims and is a material limitation.

III.

Next we turn to whether Strelchenko's precritical date claims include this material limitation.

Strelchenko's pre-critical date claims require the use of totipotent cells as the donor cells. Thus, the issue reduces to whether Strelchenko's totipotent cell limitation is the same or substantially the same subject matter as Stice's proliferating somatic cell limitation. In order to make this determination we must construe each party's claims.

A.

To construe claim language, we begin with the words of the claim. Interactive Gift Express, Inc. v. Compuserve, Inc., 256 F.3d 1323, 1331, 59 USPQ2d 1401, 1406-07 (Fed. Cir. 2001). As a general rule, claim language carries the ordinary meaning of the words in their normal usage in the field of invention. Toro Co. v. White Consol. Indus., 199 F.3d 1295, 1299, 53 USPQ2d 1065, 1067 (Fed. Cir. 1999). After looking to the claim language we consider the rest of the intrinsic evidence, that is, the written description and the prosecution history. Interactive Gift Express, 256 F.3d at 1331, 59 USPQ2d at 1406-07. There is a "heavy presumption" that a claim term takes on its ordinary meaning. Texas Digital Systems, Inc. v. Telegenix, Inc., 308 F.3d 1193, 1202, 64 USPQ2d 1812, 1817 (Fed. Cir. 2002). It is well settled that dictionaries provide evidence of a claim term's "ordinary meaning." Texas Digital Systems, 308 F.3d at 1202, 64 USPQ2d at 1018; CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 1366, 62 USPQ2d 1658, 1662 (Fed. Cir. 2002), (citing Rexnord Corp. v. Laitram Corp., 274 F.3d 1336, 1344, 60 USPQ2d 1851, 1855 (Fed. Cir. 2001)). Such dictionaries include dictionaries of the English language, which in most cases will provide the proper definitions and usages, and technical dictionaries, encyclopedias and treatises, which may be used for established specialized meanings in particular fields of art. The inventor may act as his own lexicographer and use the specification to supply implicitly or explicitly new meanings for terms. Markman v. Westview Instruments, Inc., 52 F.3d 967, 979-80, 34 USPQ2d 1321, 1330 (Fed. Cir. 1995) (en banc), aff'd, 517 U.S. 370 [38 USPQ2d 1461] (1996); CCS Fitness, 288 F.3d at 1366, 62 USPQ2d at 1662. However, claim terms take on their ordinary and accustomed meanings unless the

patentee demonstrated an intent to deviate from the ordinary and accustomed meaning of a claim term by redefining the term or by characterizing the invention in the intrinsic record using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope. Teleflex, Inc. v. Ficosa North America Corp., 299 F.3d 1313, 1325, 63 USPQ2d 1374, 1382 (Fed. Cir. 2002). Therefore, we must look to each party's written description to see whether a particular meaning has been given to the words and phrases used in the parties respective claims, and to the relevant prosecution history. Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582, 39 USPQ2d 1573, 1577 (Fed. Cir. 1996) (holding that "it is always necessary to review the specification to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning").

B.

In order to construe the parties' claims it is important to understand the meaning of "totipotent cell" and "somatic cell" as used in the claims. First we look to the ordinary meaning of these phrases. To understand the ordinary meanings, it is necessary to understand the concept of "cell differentiation." Cell differentiation refers to the process where the descendants of certain cells develop and maintain specialization of structure or function not found in ancestor cells. It is the process that leads to the expression of the phenotypic properties of mature cells from cells that originally are unspecialized. The zygote and the cells of the early stages of the embryo include undifferentiated cells. There is a point in the development of an organism by cell division and multiplication that subsequent generations of cells begin to differentiate and will ultimately give rise to the specific cells, organs and tissue of the adult. For example, as a mammalian organism develops from the single cell zygote to embryo to fetus to adult, the originally undifferentiated cells of the zygote undergo cell division and multiply to eventually develop all the various components –the cells, organs and tissues -- of the adult. Once differentiation begins, subsequent generations of cells may continue to differentiate and will eventually express the various phenotypic properties of the mature cells making up all the parts of the adult animal. Thus, skin cells, blood cells, organ cells are differentiated cells.

In its ordinary meaning, totipotency refers to cells which are unrestricted in their developmental capability. Such cells have the ability through cell division and multiplication to

differentiate into any and all parts of the adult animal. In normal animal development, totipotent cells exist only in the early development stages of an organism – principally in the zygotic and early embryonic phases. Differentiated cells are no longer totipotent in that subsequent generations of cells are not unrestricted in their developmental capacity. Once a differentiated cell forms, subsequent generations will also be differentiated. Thus, in its ordinary meaning, totipotent cells are undifferentiated cells. In other words, in the ordinary meaning to those working in the art, totipotent cells are not differentiated cells.

The cells of an organism may also be characterized into two categories: somatic cells and germ line cells. Germ line cells are cells from which the next generation of gametes – the sperm and ovum– may be derived. The gametes are the cells which pass genetic information onto the next generation of the organism. Somatic cells are non-germ line cells. In other words, somatic cells are any cell other than a germ cell or germ cell precursor.[12] In ordinary reproductive processes, somatic cells do not pass genetic information on to the next generation of the animal. Totipotent cells, which may develop into all the cells of the adult organism, including the germ cells, are germ cell precursors and are thus part of the germ line. Thus, in its ordinary meaning, somatic cells are distinct from totipotent cells. The two phrases refer to mutually exclusive categories.

Giving the phrases their ordinary meaning, Stice's 577 claims and Strelchenko's precritical date claims are directed to mutually exclusive processes of cloning. The Stice 577 claims require the insertion of certain somatic cells into an enucleated oocyte, while Strelchenko's precritical date claims require insertion of "totipotent cells."

C.

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[12] Alperts et al., Molecular Biology of the Cell, Garland Publishing Co., N.Y. & London, 1994, pp. 1012 and G-21. The parties have submitted a Joint Glossary (Paper 20) which defines "somatic cell" as a "body cell; any cell of multicellular organism other than gametes." We do not accept this definition as the ordinary meaning of the phrase because it is too narrow. As support for the definition the parties cite King et al., A Dictionary of Genetics, Oxford University Press, 1997, p. 318, which defines somatic cell as

> any cell of the eukaryotic body other than those destined to become sex cells. In diploid organisms, most somatic cells contain the 2N number of chromosomes: in tetraploid organisms, somatic cells contain the 4N number, etc. [Emphasis added.]

The King definition does not support the parties' proffered definition since it excludes more than just the gametes. It excludes cells which through differentiation are destined to produce gametes. Thus, the definition in King is not inconsistent with the definition we have adopted from Alperts.

Our analysis, however, can not stop at this point. We must look at the parties' written descriptions to see if they have given a different meaning to these phrases. Vitronics, 90 F.3d at 1582, 39 USPQ2d at 1577.

1.

It is clear from Stice's written description that Stice did not contemplate the use of totipotent cells as part of the claimed cloning process. As we noted above, totipotent cells are undifferentiated cells. What Stice considered significant was the discovery that animals could be cloned from differentiated cells. Thus, Stice states:

> Prior art methods have used embryonic cell types in cloning procedures. This includes work by Campbell et al (Nature, 380:64-68, 1996) and Stice et al (Biol. Reprod., 54:100-110, 1996). In both of those studies, embryonic cell lines were derived from embryos of less than 10 days of gestation. In both studies, the cells were maintained on a feeder layer to prevent overt differentiation of the donor cell to be used in the cloning procedure. The present invention uses differentiated cells.
>
> It was unexpected that cloned embryos with differentiated donor nuclei could develop to advanced embryonic and fetal stages. The scientific dogma has been that only embryonic or undifferentiated cell types could direct this type of development. It was unexpected that a large number of cloned embryos could be produced from these differentiated cell types. Also, the fact that new transgenic embryonic cell lines could be readily derived from transgenic cloned embryos was unexpected.

Stice 577, col. 6, ll. 12-30 (emphasis added). Stice further emphasizes the use of differentiated cells:

> The present invention relates to cloning procedures in which cell nuclei derived from differentiated fetal or adult, mammalian cells are transplanted into enucleated mammalian oocytes of the same species as the donor nuclei. The nuclei are reprogrammed to direct the development of cloned embryos, which can then be transferred into recipient females to produce fetuses and offspring, or used to produce cultured inner cell mass cells (CICM). The cloned embryos can also be combined with fertilized embryos to produce chimeric embryos, fetuses and/or offspring.

Strelchenko Ex. 2001, col. 1, ll. 5-14. The use of differentiated cells is also said to significantly simplify the cloning process involving transgenic mammals:

> The present invention also allows simplification of transgenic procedures by working with a differentiated cell source that can be clonally propagated. This eliminates the need to maintain the cells in an undifferentiated state, thus, genetic modifications, both random integration

> and gene targeting, are more easily accomplished. Also by combining nuclear transfer with the ability to modify and select for these cells in vitro, this procedure is more efficient than previous transgenic embryo techniques. According to the present invention, these cells can be clonally propagated without cytokines, conditioned media and/or feeder layers, further simplifying and facilitating the transgenic procedure. When transfected cells are used in cloning procedures according to the invention, transgenic embryos are produced which can develop into fetuses and offspring. Also, these transgenic cloned embryos can be used to produce CICM cell lines or other embryonic cell lines. Therefore, the present invention eliminates the need to derive and maintain in vitro an undifferentiated cell line that is conducive to genetic engineering techniques.

Strelchenko Ex. 2001, col. 6, ll. 40-59.

The prosecution history of Stice application 08/781,752 which matured into the Stice 577 patent, similarly demonstrates that the use of differentiated rather than totipotent (undifferentiated) cells was contemplated. Thus, the original title of the application was "Cloning Using Donor Nuclei from Differentiated Fetal and Adult Cells." Stice Application 08/781,752, Paper 1, title page. In response to a rejection and in summarizing a discussion with an examiner during an interview, applicant characterized the invention as using somatic cells and that those cells were differentiated:

> It was explained that the subject invention comprises a pioneering discovery, i.e., that somatic cells or cells committed to a somatic cell lineage may be used as nuclear transfer donors for cloning desired non-human mammals by nuclear transfer techniques. It was indicated that this was a surprising discovery as it was contravened by previous accepted dogma in the art. Essentially, prior to the present invention, it was thought that once a cell becomes differentiated that it loses its ability to be a suitable donor cell during nuclear transfer.

Stice Application 08/781,752, Paper 12, p. 7. Stice also characterized the invention as involving

> the generic discovery that cells committed to a somatic cell lineage or somatic cells or nuclei derived therefrom which are capable of division may be used as nuclear transfer donors during nuclear transplantation, and give rise to cloned non-human mammalian embryos, fetuses, and offspring.

Stice Application 08/781,752, Paper 12, p. 11.

Based upon Stice's written description and the prosecution history of Stice Application 08/781,752, we conclude that the phrase "somatic cells" as used in the Stice 577 claims connotes

differentiated cells and does not connote totipotent (undifferentiated) cells. Strelchenko has not directed us to any evidence which would indicate that "somatic cells" as used in Stice's claims would be understood to mean or include totipotent cells.

2.

Now we look to Strelchenko's specification and prosecution history to see if Strelchenko has given "totipotent cells" a particular definition different from the ordinary meaning. Strelchenko's specification expressly defines "totipotent" as follows:

> The term "totipotent" as used herein refers to a cell that gives rise to all of the cells in a developing cell mass, such as an embryo, fetus, and animal. In preferred embodiments, the term "totipotent" also refers to a cell that gives rise to all of the cells in an animal. A totipotent cell can give rise to all of the cells of a developing cell mass when it is utilized in a procedure for creating an embryo from one or more nuclear transfer steps. An animal may be an animal that functions ex utero. An animal can exist, for example, as a live born animal. Totipotent cells may also be used to generate incomplete animals such as those useful for organ harvesting, e.g., having genetic modifications to eliminate growth of a head such as by manipulation of a homeotic gene.

Strelchenko Application 09/357,445, Paper 1 (specification), p. 6, ll. 1-10. This definition is consistent with the ordinary meaning of totipotent as discussed above. Additionally, Strelchenko's specification in further explaining the meaning of "totipotent," indicates that totipotent cells do not include differentiated cells. Strelchenko specifically distinguishes totipotent from pluripotent cells which are differentiated cells:

> The term "totipotent" as used herein is to be distinguished from the term "pluripotent." The latter term refers to a cell that differentiates into a sub-population of cells within a developing cell mass, <u>but is a cell that may not give rise to all of the cells in that developing cell mass</u>. Thus, the term "pluripotent" can refer to a cell that cannot give rise to all of the cells in a live born animal.

Strelchenko Application 09/357,445, Paper 1 (specification), pp. 6, l. 27 - p. 7, ll. 1-2 (emphasis added). Thus, Strelchenko's use of "totipotent" in the specification is consistent with the ordinary meaning of the word as a cell which is unrestricted in its developmental capacity in that subsequent generations of cells may develop into all the cells of the mature animal.

3.

a.

Strelchenko, however argues for a different meaning, asserting that Strelchenko has acted as his own lexicographer. Paper 50, p. 16. In particular, Strelchenko argues that totipotent as used in the precritical date claims connotes somatic. Thus, Strelchenko states with respect to pre-critical date Claim 48:

> Given the definitions of totipotent and somatic cell in the '445 Application and the Glossary, a "totipotent mammalian cell" as claimed in Claim 48 of the '445 Application refers to a polyploid cell (i.e., somatic cell as defined) capable of developing into an organism, e.g. an embryo. . . . Strelchenko claim 48 therefore comprises a donor cell that is a proliferating somatic cell (as defined by the Glossary) capable of giving rise to a developing cell mass.

Paper 50, p. 20 (citations to exhibits deleted). Strelchenko goes on to reiterate that

> [i]t is therefore inescapable that Strelchenko Claim 48 covers the alleged point of novelty (use of a "proliferating somatic cell") claimed by Stice.

Paper 50, p. 21.

Similar argument is presented with respect to Claims 106 and 107. Both of these claims additionally require reprogramming a non-totipotent cell to be totipotent prior to nuclear transfer to form a cybrid. With respect to Claim 106 Strelchenko states:

> Given the definitions of reprogramming and totipotent cell in the '445 Application, and the definition of somatic in the Glossary, a "reprogrammed cell" obtained by culturing a non-embryonic cell, as claimed in Claim 106 of the '445 Application is substantially the same as a "proliferating somatic cell that has been expanded in culture" claimed by Stice as being able to generate an embryo (capable of developing into an organism).
>
> Therefore, the "reprogrammed cell [that] is totipotent" as claimed by Strelchenko in Claim 106 of the '445 Application as it was filed on July 20. 1999, is substantially the same subject matter as the "proliferating somatic cell that has been expanded in culture" as claimed by Stice in Claim 1 of the '577 patent.

Paper 50, pp. 22-23, citations to exhibits deleted.

Strelchenko Claim 107 depended from Claim 106 and added the requirement that the non-embryonic cells be "reprogrammed by cultivation in a culture medium." As a dependent claim, Claim 107 incorporates by reference all the limitations of the claim from which it depends. 35

U.S.C. § 112, ¶ 2. Strelchenko, inter alia, repeats the same argument that the use of a totipotent cell and a somatic cell that has been expanded in culture are substantially the same. Thus, Strelchenko states:

> Claim 107 is directed to substantially the same subject matter as the invention claimed by Stice in Claim 12 of the '577 patent. Claim 107 specifies that the "reprogrammed cell is totipotent," meaning capable of developing into an organism. Claim 107 further specifies that the "reprogramming" is achieved by culturing the cells under conditions which will create proliferating cells. Given the definitions of totipotent and somatic cell given in the '445 Application and the Glossary, a "totipotent cell" obtained by culturing a non-embryonic cell, as claimed in Claim 107 of the '445 Application is substantially the same as a "proliferating somatic cell" claimed by Stice as being able to generate an embryo (capable of developing into an organism).
>
> Therefore, the "reprogrammed" totipotent cell that is "reprogrammed by cultivation in a culture medium" as claimed by Strelchenko in Claim 107 of the '445 Application as it was filed on July 20, 1999, is substantially the same subject matter as the "proliferating somatic cell that has been expanded in culture" as claimed by Stice in Claim 1 of the '577 patent.

Paper 50, pp. 23-24.

In support of this argument, Strelchenko relies on the testimony of Dr. Eric Forsberg. Dr. Forsberg testifies:

> 5. Most of the cells of mammals have a number of copies of each chromosome, referred to as the "ploidy" of the cell.
>
> 6. The gametes of mammals are haploid having but a single copy of each chromosome.
>
> 7. Mammalian cells other than the gametes (with the exception of those cells, such as mature red blood cells, having no nucleus and hence no nuclear material) are normally polyploid having two sets of each chromosome (diploid) during most phases of the cell cycle and four sets of each chromosome (tetraploid) during certain stages of the synthesis and mitosis phases.
>
> 8. Not all germ cells are or even become, gametes.
>
> 9. Haploid cells may not by themselves, give rise to a new mammal and are therefore not "totipotent" under the definition provided in the '445

> Application, or given the ordinary meaning of "totipotent" as defined in the Joint Glossary; totipotent cells are limited to cells which are polyploid.
>
> 12. "Totipotent" as defined in the '445 Application and as understood by a person of ordinary skill in the art at the time of the disclosure, therefore refers to polyploid cells capable of generating a developing cell mass, or embryo when used in the NT process. Step (a) of Claim 48 employs the term "totipotent mammalian cell," meaning a mammalian cell that, when, used in the 'NT process, is capable of developing into an organism Claim 106 specifies that the "reprogrammed cell is totipotent," meaning capable of developing into an organism. Claim 107, by depending from Claim 106, also contains the limitation that the "reprogrammed cell is totipotent," meaning capable of developing into an organism
>
> 13. Mammalian gametes, being haploid, are not totipotent cells.
>
> 14. Totipotent cells are cells of a multicellular organism that are not mammalian gametes.
>
> 15. A totipotent cell is therefore a somatic cell (as defined in the Glossary) that has the potential to generate a developing cell mass, i.e., an embryo when used as the donor cell in the NT process.

Strelchenko Ex. 2034, pp. 2-3, ¶¶ 5-15

b.

Strelchenko's argument is not persuasive and we do not credit Dr. Forsberg's testimony on this point. Strelchenko's argument as to the meaning of somatic and totipotent is inconsistent with the ordinary meanings of those words and, more importantly, their uses in Strelchenko's specification. In their ordinary meanings in the art, somatic and totipotent are mutually exclusive. Somatic cells are defined in the art by what they are not. They are any cell other than a germ cell or a germ cell precursor.[13] A totipotent cell which may differentiate into any cell including a germ line cell, is a germ cell precursor and is thus excluded from the ordinary definition of somatic cell. Strelchenko's written description uses the word "somatic" consistently with the ordinary meaning in indicating that a somatic cell is a non-totipotent precursor cell which may be converted or reprogrammed to be a totipotent cell. Thus, Strelchenko says that one of the benefits of the invention

[13] Alperts et al., Molecular Biology of the Cell, Garland Publishing Co., N.Y. & London, 1994, pp. 1012 and G-21.

is the production of clones utilizing virtually any non-totipotent precursor cell, including non-embryonic cells:

> The present invention provides multiple advantages over the tools and methods currently utilized in the field of mammalian cloning. Such features and advantages include:
>
> (1) Production of cloned animals from virtually any type of cell. The invention provides materials and methods for reprogramming non-totipotent cells into totipotent cells. These non-totipotent cells may be of non-embryonic origin.

Strelchenko Application 09/357,445, Paper 1 (specification), p. 4, ll. 3-8. Strelchenko specifically notes that non-embryonic precursor cells include somatic cells:

> The term "non-embryonic cell" as used herein refers to a cell that is not isolated from an embryo. Non-embryonic cells can be differentiated or nondifferentiated. Non-embryonic cells can refer to nearly any somatic cell, such as cells isolated from an ex utero animal.

Strelchenko Application 09/357,445, Paper 1 (specification), p. 12, ll. 27-30, emphasis added. Similarly, in describing a preferred embodiment, Strelchenko again notes the conversion of non-totipotent precursor cells, such as somatic cells, to totipotent cells for use in cloning:

> In preferred embodiments, (1) the totipotent cells are not alkaline phosphatase positive; (2) the totipotent cells arise from at least one precursor cell; . . . (5) the precursor cell is selected from the group consisting of . . . a somatic cell . . . ; and (6) the precursor cell is preferably isolated and/or arises from a mammalian animal, more preferably an ungulate animal, and most preferably a bovine animal.

Strelchenko Application 09/357,445, Paper 1 (specification), p. 10, l. 29 - p. 11, l. 14 (emphasis added). In stating that totipotent cells "arise from a precursor cell" Strelchenko uses the phrase "arises from" to include the conversion by reprogramming of a non-totipotent cell to a totipotent cell:

> The term "arises from" as used herein refers to the conversion of one or more cells into one or more other cells. For example, a non-totipotent precursor cell can be converted into a totipotent cell by utilizing features of the invention described hereafter. This conversion process can be referred to as a reprogramming step.

Strelchenko specification, p. 12, ll. 10-16 (emphasis added).

We find that Strelchenko referenced somatic cells in the specification as an example of non-totipotent cells which may be reprogrammed to be totipotent for use in nuclear transfer. This usage

is consistent with the ordinary meanings of both somatic and totipotent. We do not credit Dr. Forsberg's testimony because it is inconsistent with both the ordinary meaning and the usage of those terms in Strelchenko's specification, particularly with Strelchenko's identification of somatic cells precursor as non-totipotent cells which can be converted into totipotent cells for use in forming a cybrid.

We hold that "totipotent" as used in Strelchenko's pre-critical date claims does not mean and does not cover "somatic." Strelchenko has not overcome the "heavy presumption" that a claim term takes on its ordinary meaning. Texas Digital Systems, 308 F.3d at 1202, 64 USPQ2d at 1818; CCS Fitness, 288 F.3d at 1366, 62 USPQ2d at 1662; K-2 Corp. v. Salomon S.A., 191 F.3d 1356, 1362-63, 52 USPQ2d 1001, 1004 (Fed. Cir. 1999); Johnson Worldwide Assocs., Inc. v. Zebco Corp., 175 F.3d 985, 989, 50 USPQ2d 1607, 1610 (Fed. Cir. 1999); Specialty Composites v. Cabot Corp., 845 F.2d 981, 986, 6 USPQ2d 1601, 1604 (Fed. Cir. 1988). Thus, Strelchenko's precritical date claims and the Stice 577 claims are directed to substantially different subject matter.

4.

When the terms totipotent and somatic are properly construed, Stice's 577 claims and Strelchenko's precritical date claims are directed to fundamentally different processes. While one of the important goals of the subject matter of both the Stice 577 claims and Strelchenko's precritical date claims was the same, i.e., the capability of using mature cells as the genetic starting material for cloning, they reached this common goal by significantly different techniques. An important aspect of Strelchenko's approach, as represented by the precritical date claims, was reprogramming mature cells to make them totipotent and use these totipotent cells or their nuclei as the donor material in cloning. E.g., Strelchenko Application 09/357,445, Paper 1 (specification), p. 4, ll. 12-23. Strelchenko specifically detailed techniques to accomplish this reprogramming. Strelchenko Application 09/357,445, Paper 1 (specification), p. 50, ll. 13-26. These reprogrammed and totipotent cells are then grown in culture and are used as the source of the donor material for nuclear transfer. Strelchenko Application 09/357,445, Paper 1 (specification), p. 61, ll. 18-19. On the other hand, the Stice 577 claims use growing and cultured differentiated somatic cells without requiring reprogramming prior to nuclear transfer. In the Stice method, mature differentiated cells are collected, grown in culture and used as the source of the donor material for nuclear transfer without

any reprogramming. Stice 577, col. 15, l. 50 - col. 17, l. 53. Indeed, Stice's claims in requiring the insertion of donor material from a "proliferating somatic cells which have been expanded in culture" excludes the use of totipotent cells. Strelchenko's opposition has not asserted, nor directed us to evidence, which would tend to show that the culturing of proliferating somatic cells described in the Stice patent would inherently convert those cells into totipotent cells prior to use in nuclear transfer. Strelchenko's precritical date claims do not claim the same or substantially the same subject matter as the Stice 577 claims.

IV.

We hold that Strelchenko's precritical date claims are not directed to the same or substantially the same subject matter as the claims of the Stice '577 patent. Accordingly, Strelchenko's involved Claims 57-58, 61-63, 69-88, 106, 112-115 and 118 are barred by 35 U.S.C. § 135(b)(1).

The University of Massachusetts' Preliminary Motion No. 1 is granted.

FINAL JUDGMENT

This interference was declared because an interference was thought to exist between the claims of Strelchenko's application, Claims 57-58, 61-63, 69-88, 106, 112-115 and 118, and various claims of the Stice patents. All of Strelchenko's involved claims have been held to be barred by 35 U.S.C. § 135(b)(1). Strelchenko has not attempted to add a claim that interfered with Stice's claims but would not be barred under § 135(b)(1). 37 CFR § 1.633(i).[14] Thus, all the pending claim in Strelchenko's involved application are unpatentable under § 135(b)(1). Section 135(b), is "a statute of repose . . . to be a statute of limitations, so to speak, on interferences so that the patentee might be more secure in his property right." Corbett v. Chisholm, 568 F.2d 759, 765, 196 USPQ 337, 342 (CCPA 1977). See also, In re McGrew, 120 F.3d 1236, 1238, 43 USPQ2d 1632, 1635 (Fed. Cir. 1997) (Noting that § 135(b) acts as a statute of repose.). Continuation of this interference under the circumstances of this case would be contrary to the purpose of § 135(b) to act as a statute of

[14] Strelchenko did file a preliminary motion under 37 CFR § 1.633(i) seeking to add additional claims to the involved application for the purpose of overcoming grounds of unpatentability raised by Stice's Preliminary Motions No. 3, 4, and 5. Strelchenko does not assert that these claims would overcome a § 135(b)(1) bar raised in Stice's Preliminary Motion No. 1.

limitation or repose. We therefore terminate this interference by awarding judgment to Stice without considering any of the other outstanding preliminary motions. As noted by the Federal Circuit it is appropriate to discontinue the interference when all of a party's involved claims are barred by the opponent's patent under § 135(b)(1). Berman v. Housey, 291 F.3d 1345, 1351 63 USPQ2d 1023, 1027 (Fed. Cir. 2002).

ORDER

It is

ORDERED that judgment on priority as to Counts 1-4, the only counts in this interference, is awarded against junior party NIKOLAI S. STRELCHENKO, JEFFREY M. BETTHAUSER, GAIL L. JURGELLA, MARVIN M. PACE and MICHAEL D. BISHOP;

FURTHER ORDERED that junior party NIKOLAI S. STRELCHENKO, JEFFREY M. BETTHAUSER, GAIL L. JURGELLA, MARVIN M. PACE and MICHAEL D. BISHOP, is not entitled to a patent containing Claims 57-58, 61-63, 69-88, 106, 112-115 and 118 of Application 09/357,445, filed **20 July 1999**;

FURTHER ORDERED that if there is a settlement agreement and it has not already been filed, attention is directed to 35 U.S.C. § 135(c) and 37 CFR § 1.661; and

FURTHER ORDERED that a copy of this decision be given an appropriate paper number and entered into the file records of Patents 5,945,577; 6,215,041 and 6,235,969 and Application 09/357,445.

RICHARD E. SCHAFER Administrative Patent Judge	)
	) BOARD OF PATENT
RICHARD TORCZON Administrative Patent Judge	) APPEALS AND
MARK NAGUMO Administrative Patent Judge	) INTERFERENCES

Entered: 18 March 2003

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