United States Patent [19]

Bell

[11] **Patent Number: 4,485,096**

[45] **Date of Patent: Nov. 27, 1984**

[54] **TISSUE-EQUIVALENT AND METHOD FOR PREPARATION THEREOF**

[75] Inventor: **Eugene Bell**, Dedham, Mass.

[73] Assignee: **Massachusetts Institute of Technology**, Cambridge, Mass.

[21] Appl. No.: **381,978**

[22] Filed: **May 26, 1982**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 352,586, Feb. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 245,536, Mar. 19, 1981, abandoned, which is a continuation-in-part of Ser. No. 972,832, Dec. 26, 1978, abandoned.

[51] **Int. Cl.**[3] **A61K 35/12**; A61K 35/36

[52] **U.S. Cl.** **424/95**; 424/177

[58] **Field of Search** 424/95, 177; 435/240

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,314,380 2/1982 Miyata et al. 3/1.9

OTHER PUBLICATIONS

Jelenska et al.–Thrombosis & Hemostasis, vol. 44, (Dec. 1980), pp. 161–163.

Bell et al.–J. of Inv. Dermatol., vol. 81, (1983), pp. 25–105.

Worst et al., J. of Nat. Cancer Inst., vol. 53, (1974), pp. 1061–1063.

Bell et al.–Am. Soc. Plastic & Reconstruct. Surgeons, vol. 67, No. 3, (Mar. 1981), pp. 386–392.

Coulomb et al.–J. of Inv. Dermat, vol. 81, (1983), pp. 75–78.

Bell et al.–Science, vol. 211, (1981), pp. 1052–1054.

Bell et al.–Proc. Nat. Acad. Sci., vol. 79, No. 3, (Mar. 1979), pp. 1274–1278.

Sarber et al.–Mechanisms of Ageing & Devel., vol. 17, (1981), pp. 107–117.

Hull et al., J. of Invest. Dermatol., vol. 81, (1983), pp. 436–438.

Hull et al.–J. of Invest. Dermatol, vol. 81, (1983), pp. 429–436.

Coulomb et al.–Brit. J. Dermatol. Supplement 1984.

Sher et al.–Transplantation, vol. 36, No. 5, (1983), pp. 552–557.

Ebendal–Zoon, vol. 2, (1974), pp. 99–104.

Stenzel et al.–Annual Rev. of Biophys. & Bioeng., vol. 3, (1974), pp. 231–253.

Elsdale et al.–J. Cell Biol., vol. 54, (1972), pp. 626–637.

Ehrmann et al.–J. Nat'l Canc. Inst., vol. 16, (1956), pp. 1375–1403.

Michalopoulos et al.–Exptl. Cell Res., vol. 94, (1975), pp. 70–78.

Gey et al.–Exptl. Cell Res., vol. 84, (1974), pp. 63–71.

Hillis et al.–Exptl. Cell Res., vol. 26, (1962), pp. 9–36.

Primary Examiner—Sam Rosen

Attorney, Agent, or Firm—Arthur A. Smith, Jr.; David E. Brook

[57] **ABSTRACT**

A tissue-equivalent, useful in the treatment of burns or other skin wounds and in the fabrication of prostheses, is disclosed which is prepared from a hydrated collagen lattice contracted by a contractile agent, such as fibroblast cells or blood platelets, to form tissue-equivalent. In one embodiment, a skin-equivalent can be fabricated by growing a layer of keratinocyte cells thereon. Both the keratinocyte cells and contractile agent may be derived from the potential recipient of the skin-equivalent.

29 Claims, 14 Drawing Figures