# United States Patent [19]

**Lim**

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[54] **MICROCAPSULES CONTAINING VIABLE TISSUE CELLS**


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[ * ] Notice: The portion of the term of this patent subsequent to Oct. 5, 1999, has been disclaimed.

[21] Appl. No.: **259,595**

[22] Filed: **May 1, 1981**

**Related U.S. Application Data**

[63] Continuation of Ser. No. 24,000, Mar. 28, 1979, Pat. No. 4,352,883, which is a continuation-in-part of Ser. No. 953,413, Oct. 23, 1978, abandoned.

[51] **Int. Cl.**[3] ..... **C12N 11/10;** C12N 11/04; C12N 5/00

[52] **U.S. Cl.** ..... **435/178;** 3/1; 264/4; 424/34; 424/35; 424/94; 435/1; 435/175; 435/182; 435/240

[58] **Field of Search** ..... 435/174, 182, 188, 262, 435/1, 240, 177, 178, 241; 424/DIG. 7, 31, 32, 34, 94, 101, 106, 110, 178; 264/4; 252/316; 3/1



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[57] **ABSTRACT**

Tissue cells such as islet of Langerhans cells or liver cells are encapsulated within a spheroidal semipermeable membrane comprising a polysaccharide having acidic groups cross-linked with a polymer having a molecular weight greater than 3,000. The cells within the microcapsules are viable, healthy, physiologically active and capable of ongoing metabolism. The encapsulated cells are useful for implantation in a mammalian body to produce substances and effect chemical changes characteristic of the cells in vivo tissue.


**12 Claims, 1 Drawing Figure**