

- [54] **ENCAPSULATION OF BIOLOGICAL MATERIAL**
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- [21] **Appl. No.:** 24,600
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Related U.S. Application Data

- [63] Continuation-in-part of Ser. No. 953,413, Oct. 23, 1978, abandoned.
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- [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** 435/1, 182, 188, 262, 435/174, 175, 177, 178, 240; 424/31, 32, 34, 94, 101, 106, 110, 178; 264/4; 252/316; 3/1

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[57] **ABSTRACT**

A core material such as living tissue, individual cells, hormones, enzymes or antibodies is encapsulated in a semipermeable membrane that is permeable to small molecules for contact with the core material but is impermeable to potentially deleterious large molecules. Encapsulation may be carried out by suspending the core material in an aqueous medium containing a water soluble gum that can be reversibly gelled, forming the suspension into droplets, contacting the droplets with a solution of multivalent cations to gel the droplets as discrete, shape-retaining, water insoluble temporary capsules and cross-linking a surface layer of the temporary capsules to produce a semipermeable membrane around the capsules. Optionally the gel within the membrane may be reliquified by removing multivalent cations from the gel.

22 Claims, 1 Drawing Figure