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United States Patent [19] McMullen

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- [54] **BIOCOMPATIBLE GRADIENT CONTROLLED RELEASE IMPLANT**
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Related U.S. Application Data

- [63] Continuation-in-part of Ser. No. 663,390, Mar. 4, 1991, abandoned.
- [51] Int. Cl.⁵ **A61K 9/26; A61K 9/32; A61K 47/32**
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- [58] Field of Search **424/473, 472, 469, 470, 424/486; 514/772.3**

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[57] ABSTRACT

A biocompatible and/or biodegradable implant for the substantially constant release, by diffusion, of a therapeutic agent in the outside medium at the site of implant which comprises a body consisting of a core defining a solid mass having walls and being formed of a first biocompatible and/or biodegradable polymeric material and having embedded therein a plurality of solid particles of a therapeutic agent which allows for the diffusion of the therapeutic agent from the core in the outside medium; and a coating of a second biocompatible and/or biodegradable polymeric material which prevents the diffusion of the therapeutic agent in the outside medium and the coating covering all but one of the walls. When diodegradable polymers are used, the degradation half-life of the first and second polymeric materials is longer than the diffusion half-life of the therapeutic agent. The plurality of solid particles of therapeutic agent having varying dimensions, the sizes of which increase from one surface of the core facing the diffusion medium to an opposite wall thus defining a mixture having a concentration gradient; this allows a diffusion of the therapeutic agent at a substantially constant rate. The implant is particularly useful for the slow release of a therapeutic agent in a body fluid.

5 Claims, 2 Drawing Sheets

