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Golub et al.

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[54] **USE OF TETRACYCLINE TO ENHANCE BONE PROTEIN SYNTHESIS AND/OR TREATMENT OF BONE DEFICIENCY**

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Related U.S. Patent Documents

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[63] Continuation-in-part of Ser. No. 699,048, Feb. 7, 1985, Pat. No. 4,704,383, which is a continuation-in-part of Ser. No. 566,517, Dec. 29, 1983, Pat. No. 4,666,897.

[51] Int. Cl.⁵ **A61K 31/65**

[52] U.S. Cl. **514/152; 514/899**

[58] Field of Search **514/152**

[56] References Cited

U.S. PATENT DOCUMENTS

- 2,895,880 7/1959 Rosenthal .
- 3,304,227 2/1967 Loveless .
- 3,636,202 1/1972 Klein .
- 3,914,299 10/1975 Muxfeldt .
- 4,248,892 2/1981 Kanamaru et al. .
- 4,276,284 6/1981 Brown .
- 4,371,465 2/1983 McGregor .
- 4,454,110 6/1984 Cislavsk et al. .
- 4,457,936 7/1984 Draeger et al. .
- 4,666,897 5/1987 Golub et al. .
- 4,704,383 11/1987 McNamara et al. .
- 4,925,833 5/1990 Golub et al. .
- 4,935,411 6/1990 McNamara et al. .
- 4,935,412 6/1990 McNamara et al. .

FOREIGN PATENT DOCUMENTS

- 787882 12/1957 United Kingdom .
- 925282 5/1963 United Kingdom .

OTHER PUBLICATIONS

- Golub, et al., *Chemical Abstracts*, 100:96203a, (1984).
- Engesaeter, et al., *Chemical Abstracts*, 93:142977t, (1980).
- Smirnov, I. V., *Chemical Abstracts*, 76:30596, (1969).
- Valcavi, et al., *Chemical Abstracts*, 95:6899h, (1981).
- Brandt, et al., *Chemical Abstracts*, 92:163746m, (1979).
- Glantz, et al., *Chemical Abstracts*, 91:20178w, (1979).
- Muxfeldt, *Chemical Abstracts*, 76:140344j, (1972).
- Bitha, et al., *Chemical Abstracts*, 72:43253P, (1970).
- Myl'nikova, *Chemical Abstracts*, 86:66138h, (1976).
- Plakunov, *Chemical Abstracts*, 80:104410b, (1973).
- Dreisbach, et al., "Induction of Collagenase Production in *Vibrio B-30*", *J. Bacteriology*, vol. 135, No. 2, pp. 521-527, (1978).
- Goodman and Gilman, *The Pharmacological Basis of Therapeutics*, 6th edition, p. 961-2, (1980).
- Perry, et al., "Systemic Tetracycline in the Treatment of Non-Infected Corneal Ulcers and Persistent Epithelial Defects", *J. Period Res.* 83:20, 185-195 (Abstract and Artide) (1984).
- Gomes, et al., "Tetracyclines Inhibit Parathyroid Hormone-Induced Bone Resorption in Organ Culture",

(List continued on next page.)

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[57] ABSTRACT

Tetracyclines, antibacterial and non-antibacterial tetracyclines, have been found to be useful in the treatment of osteoporosis in humans by administering to the human suffering from osteoporosis an effective amount of a tetracycline to enhance bone protein synthesis. Tetracyclines which have been found to be effective in the treatment of osteoporosis in humans include minocycline, doxycycline and dedimethylaminotetracycline.

20 Claims, No Drawings