



US006024975A

United States Patent [19]

[11] Patent Number: **6,024,975**

D'Angelo et al.

[45] Date of Patent: **Feb. 15, 2000**

[54] **METHOD OF TRANSDERMALLY ADMINISTERING HIGH MOLECULAR WEIGHT DRUGS WITH A POLYMER SKIN ENHANCER**

5,232,703 8/1993 Blank 424/449
5,234,957 8/1993 Mantelle 424/485
5,252,334 10/1993 Chiang et al. 424/448

[75] Inventors: **Joseph P. D'Angelo**, Miami; **Henry Schur**, Hallandale, both of Fla.

“Controlled-Release Technology” Lee et al., 1986.

[73] Assignee: **Americare International Diagnostics, Inc.**

Primary Examiner—D. Gabrielle Brouillette
Attorney, Agent, or Firm—Herbert L. Lerner; Laurence A. Greenberg

[21] Appl. No.: **08/745,496**

[57] ABSTRACT

[22] Filed: **Nov. 12, 1996**

Related U.S. Application Data

[63] Continuation-in-part of application No. 08/588,003, Jan. 17, 1996, abandoned, which is a continuation of application No. 08/141,199, Oct. 21, 1993, abandoned, which is a continuation-in-part of application No. 07/865,309, Apr. 8, 1992, abandoned.

A high molecular weight drug is transdermally administered by applying a polymer skin enhancer and a drug active to the skin of the patient. The drug active has a molecular weight of above 50 daltons and takes at least 15% by weight of the system. The drug may be encapsulated or the drug solution may be partly encapsulated and partly free. The skin enhancer is polyvinylpyrrolidone (PVP) and it is mixed at between 7 and 35% of the drug. A gelling agent may be optionally added at up to 20% by volume. The chemical system is preferably administered via a multidose transdermal drug patch assembly which includes a drug-impervious support impressed to form a series of compartments. Each compartment is a reservoir for a unit dose of a drug active to be transdermally administered. The support is adhesively secured to the skin of a patient. Individual devices are provided for resealably enclosing the drug active in each of the reservoirs. The individual enclosing devices are removable to release the unit dose into contact with the skin of the patient and are actuable to control the transdermal absorption of the drug actives. The drug may also be administered in a creme.

[51] **Int. Cl.**⁷ **A61F 13/00**
[52] **U.S. Cl.** **424/449**; 514/944; 514/946;
424/70.15; 424/448
[58] **Field of Search** 424/448, 449,
424/70.15; 514/944, 946

[56] References Cited

U.S. PATENT DOCUMENTS

4,573,996 3/1986 Kwiatek et al. 424/434
4,624,665 11/1986 Nuwayser 604/307
4,666,441 5/1987 Andriola et al. 424/448
4,952,560 8/1990 Kigasawa 514/2
5,162,043 11/1992 Lew 604/20
5,225,192 7/1993 Lovrechich 424/78.01

24 Claims, 10 Drawing Sheets

