

The  
United  
States  
of  
America



The Commissioner of Patents  
and Trademarks

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person or persons having title to this patent the right to exclude others from making, using or selling the invention throughout the United States of America for the term of seventeen years from the date of this patent, subject to the payment of maintenance fees as provided by law.

*Michael K. Kirk*

Acting Commissioner of Patents and Trademarks

*Sandra L. Morton*  
Attest



US005230902A

United States Patent [19]  
Gold et al.

[11] Patent Number: 5,230,902  
[45] Date of Patent: Jul. 27, 1993

[54] UNDENATURED WHEY PROTEIN  
CONCENTRATE TO IMPROVE ACTIVE  
SYSTEMIC HUMORAL IMMUNE  
RESPONSE

[75] Inventors: Phil Gold, Westmount; Gustavo  
Bounous, Montreal; Patricia A. L.  
Kongshavn, St. Lambert, all of  
Canada

[73] Assignee: Immunotec Research Corporation,  
Montreal, Canada

[21] Appl. No.: 563,794

[22] Filed: Aug. 3, 1990

Related U.S. Application Data

[63] Continuation of Ser. No. 289,971, Dec. 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 188,271, Apr. 27, 1988, abandoned.

[51] Int. Cl.<sup>3</sup> ..... A61K 35/20  
[52] U.S. Cl. .... 424/535; 514/2;  
530/365; 530/833

[58] Field of Search ..... 514/2, 21, 251, 276,  
514/885; 530/365, 833; 424/535; 426/72

[56] References Cited

U.S. PATENT DOCUMENTS

4,710,387 12/1987 Uiterwaal et al. .... 726/72  
4,753,926 6/1988 Lucas et al. .... 514/251  
4,784,685 11/1988 Meister ..... 71/106

FOREIGN PATENT DOCUMENTS

1136919 7/1982 Canada .  
0022696 1/1981 European Pat. Off. .  
239722 10/1987 European Pat. Off. .  
2296428 9/1976 France ..... 514/21  
WO87/4050 7/1987 PCT Int'l Appl. .

1495940 12/1977 United Kingdom ..... 424/95

OTHER PUBLICATIONS

Horwitt, M. K. in *The Vitamins*, 2d ed., vol. V, Academic Press, New York, 1972, pp. 88-96.  
Jansen, B. C. P. in *The Vitamins*, 2d ed., vol. V., Academic Press, New York, 1972, pp. 156-164.  
Bounous et al. *J Nutr* 112(9):1747-1755 (1982).  
Bounous et al. *J Nutr* 113:1415-1421 (1983).  
Bounous et al. *J Nutr* 115(11):1409-1417 (1985).

Primary Examiner—Douglas W. Robinson  
Assistant Examiner—Jean C. Witz  
Attorney, Agent, or Firm—John P. White; Craig J. Arnold

[57] ABSTRACT

This invention provides a method of improving the humoral immune response or increasing the concentration levels of glutathione in mammals, which comprises administering orally to a mammal a therapeutically or a prophylactically effective amount of undenatured whey protein concentrate which has a biological activity based on the overall amino acid and associated small peptides pattern resulting from the contribution of all its protein components. A method for improving the humoral immune response in mammals also is disclosed which comprises administering orally to a mammal the combination of a vitamin supplement containing vitamin B<sub>2</sub> in an amount in excess of minimum daily requirements and an effective amount of undenatured whey protein concentrate. This invention further provides a dietary supplement for a mammal which comprises an effective amount of vitamin B<sub>1</sub> and B<sub>2</sub> and a therapeutically or prophylactically effective amount of whey protein supplement.

16 Claims, 9 Drawing Sheets