XR 4,342,826

United States
Cole

[11] 4,342,826
[45] Aug. 3, 1982

[54] IMMUNOASSAY PRODUCTS AND METHODS

[75] Inventor: Francis X. Cole, Stow, Mass.

[73] Assignee: Collaborative Research, Inc., Waltham, Mass.

[21] Appl. No.: 222,815

[22] Filed: Jan. 12, 1981

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 117,864, Feb. 4, 1980, abandoned.

[51] Int. Cl.³ C12W 11/04; G01W 33/54

[52] U.S. Cl. ..... 435/7; 435/177; 435/182; 435/188; 435/810; 23/230 B; 424/12

[58] Field of Search ..... 435/4, 7, 177, 180, 435/182, 188, 810; 424/12; 23/230 B; 252/408 R

[56] References Cited

U.S. PATENT DOCUMENTS

3,850,578	11/1974	McConnell	23/230
3,887,698	6/1975	McConnell et al.	23/230
3,937,668	2/1976	Zolle	252/316
4,021,364	5/1977	Sperser et al.	252/316
4,078,052	3/1978	Papahadjopoulos et al.	424/36
4,193,983	3/1880	Ullman et al.	435/7
4,235,792	11/1980	Hsia et al.	424/12
4,235,871	11/1980	Papahadjopoulos et al.	424/19
4,241,046	12/1980	Papahadjopoulos et al.	424/19

OTHER PUBLICATIONS

Wei, et al., *J. Immunol Methods,* vol. 9, (1975), pp. 165–170.

Rosenquist, et al., *J. Immunol Methods,* vol. 15, (1977), pp. 147–155.

Chan, et al., *J. Immunol Methods,* vol. 21, (1978), pp. 185–195.

Hagis, et al., *Biochem. Biophys. Res. Comm.*, vol. 95, (1980), pp. 187–192.

Shiba, et al., "Thin-Layer Potentiometric Analysis of Lipid Antigen–Antibody Reaction by Tetrapontylammonium (TPA+) Ion Loaded Liposomes and TPA & Ion Selective Electrode", *Anal Chem.,* vol. 52, No. 11, (1980), pp. 1610–1613.

Gregoriadis, et al., *Liposomes in Biological Systems,* 156, 158, 159 & 174–178.

Smolasky, et al., *J. Immunol. Methods,* vol. 15, (1977), pp. 255–265.

D'Osazlo et al., *Anal. Chem.,* vol. 49, (1977), pp. 2083–2086.

Strejnn, et al., "Naturally Occurring Antibodies to Liposomes", *J. Immunol.,* vol. 123, No. 1, (1979), pp. 370–378.

Uemura et al., "Active vs Passive Sensitization of Liposomes Toward Antibody and Complement by Dinitrophenylated Derivatives of Phosphatidylethanolamine", *Biochem.,* vol. 11, No. 22, (1972), pp. 4085–4094.

Kataoka, et al., "Release of Macromolecular Markers (Enzymes) from Liposomes Treated with Antibody and Complement", *Biochimica Biophysica ACTA,* vol. 293, No. 2 (1973), pp. 158–179.

Rosenthal, et al., "Evaluation of Enzyme-Multiplied Immunoassay Technique (EMIT) for Determination of Serum Digoxin", *Clin. Chem.,* vol. 22, No. 11, (1976), pp. 1899–1902.

Primary Examiner—Thomas G. Wiseman
Attorney, Agent, or Firm—Wolf, Greenfield & Sacks

[57] ABSTRACT

An immunoassay method utilizes antigen tagged, enzyme encapsulating liposomes which are immunospecifically ruptured in the presence of cognate antibody and active complement. A homogeneous phase reaction occurs with the antibody and complement acting to release the enzyme if an immunospecific antigen-antibody complex is formed at the surface of the liposome. The positions of the antigen and antibody can be reversed.

10 Claims, No Drawings