


Notice: This patent is subject to a terminal disclaimer.

Appl. No.: 08/100,197
Filed: Aug. 2, 1993

Related U.S. Application Data

Continuation of application No. 07/957,073, Oct. 6, 1992, abandoned, which is a continuation of application No. 07/609,744, Nov. 6, 1990, abandoned, which is a continuation of application No. 07/113,179, Oct. 23, 1987, Pat. No. 5,441,865, which is a continuation of application No. 06/675,296, Nov. 30, 1990, Pat. No. 5,221,194, which is a continuation-in-part of application No. 06/555,841, Sep. 28, 1994, abandoned, which is a continuation-in-part of application No. 06/582,185, Feb. 21, 1994, abandoned, which is a continuation-in-part of application No. 06/561,024, Dec. 13, 1993, abandoned.

Int. Cl.6 A61K 38/16
U.S. Cl. 514/8, 514/12, 530/351; 530/363; 530/395; 530/350

Field of Search 424/439; 435/69.1; 435/69.2, 69.3, 69.6; 71.1, 71.2, 71.21; 72.3; 436/8; 514/8, 778, 970, 12; 530/351; 361, 395, 350

References Cited

U.S. PATENT DOCUMENTS
3,033,753 5/1962 White et al. 530/395
3,865,801 2/1975 Chiba et al. 530/397
4,237,224 12/1980 Cohen et al. 435/691
4,254,095 3/1981 Fischer et al. 435/513
4,264,731 4/1981 Shin et al. 435/91.41
4,273,875 6/1981 Manis et al. 435/91.4
4,293,652 10/1981 Cohen et al. 435/91.1
4,303,650 12/1981 Takezawa et al. 424/177
4,338,397 7/1982 Gilbert et al. 435/69.1
4,358,535 11/1982 Falkow et al. 435/5
4,394,443 7/1983 Weissman et al. 435/6
4,409,216 5/1984 Axel et al. 435/6
4,411,994 10/1983 Gilbert et al. 435/69.7
4,424,205 4/1984 Hamer et al. 435/69.3
4,465,624 8/1984 Chiba et al. 530/395
4,468,464 8/1984 Cohen et al. 435/520.1
4,503,151 3/1985 Paddock et al. 435/69.1
4,517,294 5/1985 Boeck et al. 435/70
4,558,005 12/1985 Goldwasser et al. 435/7.92
4,558,006 12/1985 Egrie 435/7.94
4,568,488 2/1986 Lee-Huang et al. 530/397
4,667,016 5/1987 Lai et al. 530/397
4,677,195 6/1987 Hewick et al. 514/8
4,695,542 9/1987 Yokata et al. 435/69.4
4,703,008 10/1987 Lin et al. 435/360
4,710,473 12/1987 Morris et al. 435/520.1
4,757,006 7/1987 Teole et al. 435/69.6
4,806,524 2/1989 Kawaguchi et al. 514/8

FOREIGN PATENT DOCUMENTS
0123294 4/1984 European Pat. Off.
0116446 8/1984 European Pat. Off.
0117058 8/1984 European Pat. Off.
0117059 8/1984 European Pat. Off.
0117060 8/1984 European Pat. Off.
33 16 287 A1 11/1983 Germany
33 48 289 C2 11/1983 Germany
2085887 5/1982 United Kingdom
83 04065 11/1983 WIPO
83 05961 5/1985 WIPO
83 05097 7/1985 WIPO
83 04319 10/1985 WIPO
86 03520 6/1986 WIPO

OTHER PUBLICATIONS

Primary Examiner—James Martinell
Attorney, Agent, or Firm—Bell, Boyd & Lloyd

ABSTRACT

Disclosed are novel polypeptides possessing part or all of the primary structural information and one or more of the biological properties of mammalian erythropoietin ("EPO") which are characterized in preferred forms by being the product of procarotylic or eucaryotic host expression of an exogenous DNA sequence. Illustratively, genomic DNA, cDNA and manufactured DNA sequences coding for part or all of the sequence of amino acid residues of EPO or for analogs thereof are incorporated into autonomously replicating plasmid or viral vectors employed to transform or transfect suitable procarotylic or eucaryotic host cells such as bacteria, yeast or vertebrate cells in culture. Upon isolation from culture media or cellular lysates or fragments, products of expression of the DNA sequences display, e.g., the immunological properties and in vitro and in vivo biological activities of EPO of human or monkey species origins. Disclosed also are chemically synthesized polypeptides sharing the biochemical and immunological properties of EPO. Also disclosed are improved methods for the detection of specific single stranded polynucleotides in a heterologous cellular or viral sample prepared from, e.g., DNA present in a plasmid or viral-borne cDNA or genomic DNA "library".

2 Claims, 27 Drawing Sheets
OTHER PUBLICATIONS

Anderson et al., "Isolation of a genomic clone for bovine pancreatic trypsin inhibitor by using a unique-sequence synthetic DNA probe," *PNAS* (USA), 80, 6838–6842 (Nov. 1983).


Broome et al., "Immunological screening method to detect specific translation products," *PNAS* (USA), 75(6), 2746–2749 (Jun 1978).


Canaan et al., "Regulated expression of human interferon β1 gene after transduction into cultured mouse and rabbit cells," *PNAS* (USA), 79, 5166–5170 (Sep. 1982).


Das et al., “Use of synthetic oligonucleotide probes complementary to genes for human HLA-DR and β2m as extension primers for the isolation of S- and β-specific genomic clones,” P.N.A.S. (USA), 80, 1531–1535 (Mar. 1983).


Gene Screen, New England Nuclear, Catalog No. NEF-972.
Grimaldi et al., "Interspersed repeated sequences in the African green monkey genome that are homologous to the human Alu family," *Nucleic Acid Research*, 9(21), 5553–5568 (2981).


Imai et al., "Physicochemical and Biological Comparison of Recombinant Human Erythropoietin with Human Urinary Erythropoietin" *J. Biochem.*, 107, 352–359 (1990)


LKB Technical Bulletin #2217.


Pitha et al., "Induction of human β–interferon synthesis with poly (rI·rC) in mouse cells transfected with cloned cDNA plasmids," P.N.A.S. (USA), 79, 4337–7341 (Jul. 1982).


