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(21) International Application Number: PCT/US98/23744 (22) International Filing Date: 9 November 1998 (09.11.98) (30) Priority Data: 08/971,439 17 November 1997 (17.11.97) US (63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Application US 08/971,439 (CIP) Filed on 17 November 1997 (17.11.97) (71) Applicant (for all designated States except US): WASHINGTON UNIVERSITY [US/US]; One Brookings Drive, St. Louis, MO 63110 (US). (72) Inventor; and (75) Inventor/Applicant (for US only): BOIME, Irving [US/US]; 27 Oak Park Drive, St. Louis, MO 63141 (US). (74) Agents: MURASHIGE, Kate, H. et al.; Morrison & Foerster LLP, 2000 Pennsylvania Avenue, N.W., Washington, DC 20006-1888 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(54) Title: SINGLE-CHAIN BIFUNCTIONAL GLYCOPROTEIN HORMONES (57) Abstract Single-chain agonists and/or antagonists of the glycoprotein hormones are disclosed. These proteins are of the formulae: (1) $\beta^1-(\text{linker}^1)_m-\alpha-(\text{linker}^2)_n-\beta^2$; or (2) $\beta^1-(\text{linker}^1)_m-\beta^2-(\text{linker}^2)_n-\alpha$; or (3) $\alpha-(\text{linker}^1)_m-\beta^1-(\text{linker}^2)_n-\beta^2$, wherein each of β^1 and β^2 has the amino acid sequence of the β subunit of a vertebrate glycoprotein hormone or a variant thereof; " α " designates the α subunit of a vertebrate glycoprotein hormone or a variant thereof; "linker" refers to a covalently linked moiety that the spaces β^1 and β^2 subunits at distances from the α subunit and from each other effective to retain said activity, and each of m and n is independently 0 or 1.		