



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷: C07K 14/59, A61K 38/24, C07K 16/26	A1	(11) International Publication Number: WO 00/23473 (43) International Publication Date: 27 April 2000 (27.04.00)
(21) International Application Number: PCT/US99/23555 (22) International Filing Date: 12 October 1999 (12.10.99) (30) Priority Data: 09/175,017 19 October 1998 (19.10.98) US (63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Application US 09/175,017 (CIP) Filed on 19 October 1998 (19.10.98) (71) Applicant (for all designated States except US): WASHINGTON UNIVERSITY [US/US]; One Brookings Drive, St. Louis, MO 63130 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): BOIME, Irving [US/US]; 27 Oak Park Drive, St. Louis, MO 63141 (US). BEN-MENACHEM, David [IL/US]; 12175-B Vivacite Walk, St. Louis, MO 63146 (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, GE, GH, GM, HR, HU, ID, IL, IN, 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, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, 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>
(54) Title: MULTIPLE DOMAIN GLYCOPROTEIN HORMONES AND METHODS OF USING		
(57) Abstract Forms of differentially acting glycoprotein hormones are disclosed. These compositions are of the formula: (1): $\beta^1\text{-(linker}^1\text{)}_m\text{-}\alpha\text{-(linker}^2\text{)}_n\text{-}\beta^2$; (2): $\beta^1\text{-(linker}^1\text{)}_m\text{-}\beta^2\text{-(linker}^2\text{)}_n\text{-}\alpha$; (3): $\alpha\text{-(linker}^1\text{)}_m\text{-}\beta^1\text{-(linker}^2\text{)}_n\text{-}\beta^2$; (4): $\beta^2 \approx \alpha\text{-(linker)}_m\text{-}\beta^1$; or (5): $\beta^1\text{-(linker)}_m\text{-}\alpha \approx \beta^2$ 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 of said amino acid sequence, as variants are defined herein. "α" designates the α subunit of a vertebrate glycoprotein hormone or a variant thereof; "linker" refers to a covalently linked moiety that spaces the β^1 and β^2 subunits at appropriate distances from the α subunit and from each other. "$\approx$" is a noncovalent link. Each of m and n is independently 0 or 1.		