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<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> (21) International Application Number: PCT/US97/11909 (22) International Filing Date: 9 July 1997 (09.07.97) (30) Priority Data: 08/687,803 19 July 1996 (19.07.96) US (71) Applicant: BAYER CORPORATION [US/US]; One Mellon Center, 500 Grant Street, Pittsburgh, PA 15219-2507 (US). (72) Inventors: GREVE, Jeffrey; 18 Prospect Court, Woodbridge, CT 06525 (US). SHANAFELT, Armen, B.; 25 Benham Hill Place, Hamden, CT 06514 (US). ROCZNIAK, Steven; 46 Maler Avenue, Shelton, CT 06484 (US). (74) Agents: GREENMAN, Jeffrey, M. et al.; Bayer Corporation, 400 Morgan Lane, West Haven, CT 06516-4175 (US). </td> <td style="width: 50%; vertical-align: top;"> (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, HU, 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, TJ, TM, TR, TT, UA, UG, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>Without international search report and to be republished upon receipt of that report.</i> REPLACED SHEETS SG ☐ Description : paged to paged ☒ Claim(s) : paged 110 to paged 43 ☐ Drawing(s) : paged to paged ☐ Abstract : paged to paged </td> </tr> </table>			(21) International Application Number: PCT/US97/11909 (22) International Filing Date: 9 July 1997 (09.07.97) (30) Priority Data: 08/687,803 19 July 1996 (19.07.96) US (71) Applicant: BAYER CORPORATION [US/US]; One Mellon Center, 500 Grant Street, Pittsburgh, PA 15219-2507 (US). (72) Inventors: GREVE, Jeffrey; 18 Prospect Court, Woodbridge, CT 06525 (US). SHANAFELT, Armen, B.; 25 Benham Hill Place, Hamden, CT 06514 (US). ROCZNIAK, Steven; 46 Maler Avenue, Shelton, CT 06484 (US). (74) Agents: GREENMAN, Jeffrey, M. et al.; Bayer Corporation, 400 Morgan Lane, West Haven, CT 06516-4175 (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, HU, 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, TJ, TM, TR, TT, UA, UG, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>Without international search report and to be republished upon receipt of that report.</i> REPLACED SHEETS SG ☐ Description : paged to paged ☒ Claim(s) : paged 110 to paged 43 ☐ Drawing(s) : paged to paged ☐ Abstract : paged to paged
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(54) Title: HIGH-AFFINITY INTERLEUKIN-4 MUTEINS (57) Abstract A recombinant human IL-4 mutein numbered in accordance with wild-type IL-4 wherein the mutein comprises at least one amino acid substitution in the binding surface of either the A- or C-alpha helices of the wild-type IL-4 whereby the mutein binds to the IL-4Rα receptor with at least greater affinity than native IL-4. The substitution is more preferably selected from the group of positions consisting of, in the A-helix, positions 13 and 16, and in the C-helix, positions 81 and 89. A most preferred embodiment is the recombinant human IL-4 mutein wherein the substitution at position 13 is Thr to Asp. Pharmaceutical compositions, amino acid and polynucleotide sequences encoding the muteins, transformed host cells, antibodies to the muteins, and methods of treatment are also described. • IL-4Rα (high affinity): A-, C- helices • IL-2Rγ (signaling): D-helix				