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(71) Applicant (for all designated States except US):

MANKIND, CORP [US/US]; One Casper Street, Dan-
bury, CT 06810 (US).

(72) Inventors; and

(75) **Inventors/Applicants (for US only): FREEMAN, John, J.** [US/US]; 6 Topstone Rd., New Fairfield, CT 06812 (US). **STAMPER, Adrienne** [US/US]; 7 Coventry Lane, Naugatuck, CT 06770 (US). **HEITMANN, Melissa** [US/US]; 8 East Hook Cross Road, Hopewell Junction, NY 12533 (US).

(74) **Agents: JACKSON, Christopher, M.** et al.; Standley Law Group LLP, 6300 Riverside Drive, Dublin, OH 43017 (US).

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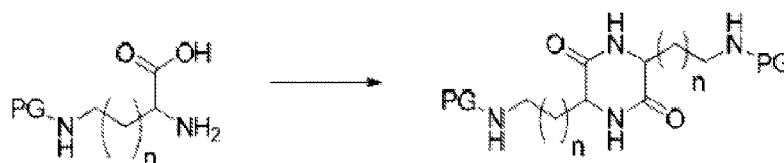
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(54) **Title:** FORMATION OF N-PROTECTED BIS-3,6-(4-AMINOALKYL) -2,5-DIKETOPIPERAZINE

**Figure 1**

(57) **Abstract:** The disclosed embodiments detail improved methods for the synthesis of diketopiperazines from amino acids. In particular improved methods for the cyclocondensation and purification of N-protected 3,6-(aminoalkyl)-2,5-diketopiperazines from N-protected amino acids. Disclosed embodiments describe methods for the synthesis of 3,6-bis-[N-protected aminoalkyl]-2,5-diketopiperazine comprising heating a mixture of an amino acid in the presence of a catalyst in an organic solvent. The catalyst is selected from the group comprising sulfuric acid, phosphoric acid, p-toluenesulfonic acid, 1-propylphosphonic acid cyclic anhydride, tributyl phosphate, phenyl phosphonic acid and phosphorous pentoxide among others. The solvent is selected from the group comprising: dimethylacetamide, N-methyl-2-pyrrolidone, diglyme, ethyl glyme, proglyme, ethyldiglyme, m-cresol, p-cresol, o-cresol, xylenes, ethylene glycol and phenol among others.

