



- (51) **International Patent Classification:**  
*G16H 20/10* (2018.01) *G06N 20/00* (2019.01)
- (21) **International Application Number:**  
PCT/US2024/019806
- (22) **International Filing Date:**  
13 March 2024 (13.03.2024)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**  
63/451,814 13 March 2023 (13.03.2023) US  
63/590,387 13 October 2023 (13.10.2023) US
- (71) **Applicants:** PHENOMIX SCIENCES, INC. [US/US]; 100 Westgate Drive, Suites 1002-1003, St. Paul, Minnesota 55114 (US). MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH [US/US]; 200 First Street SW, Rochester, Minnesota 55905 (US).
- (72) **Inventors:** ACOSTA, Andres, J.; c/o Mayo Foundation for Medical Education and Research, 200 First Street SW, Rochester, Minnesota 55905 (US). CAMILLERI,

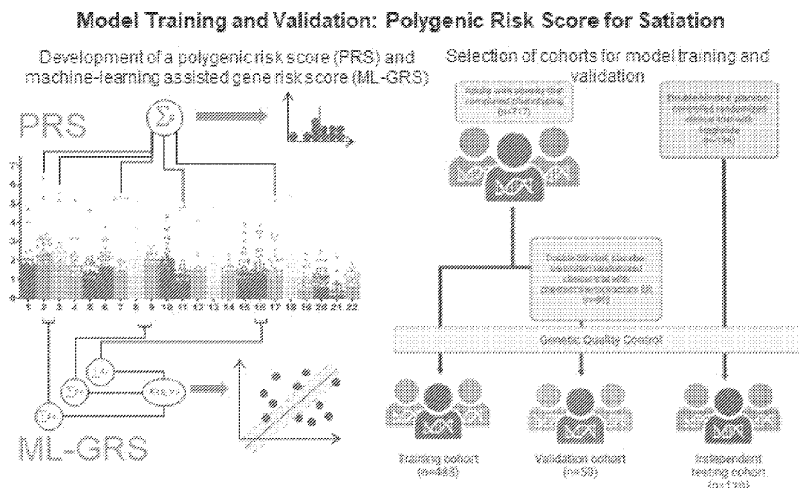
Michael, L.; c/o Mayo Foundation for Medical Education and Research, 200 First Street SW, Rochester, Minnesota 55905 (US). CIFUENTES, Lizeth; c/o Mayo Foundation for Medical Education and Research, 200 First Street SW, Rochester, Minnesota 55905 (US). O'CONNOR, Timothy; c/o Phenomix Sciences, Inc., 100 Westgate Drive, Suite 1002-1003, St. Paul, Minnesota 55114 (US).

(74) **Agent:** TUSCAN, Michael, S. et al.; Cooley LLP, 1299 Pennsylvania Ave., NW, Suite 700, Washington, District of Columbia 20004 (US).

(81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH,

(54) **Title:** METHODS FOR PREDICTING RESPONSE TO PHARMACOLOGICAL AGENTS IN PATIENTS WITH OBESITY

**FIG. 10C**



(57) **Abstract:** The present disclosure relates to methods and systems for determining an obesity phenotype in an individual with obesity that utilizes predictive machine learning models and gene risk score calculations. Methods are also provided for selecting responders and non-responders to select pharmacotherapies based on an individual with obesity's determined obesity phenotype.

[Continued on next page]

TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS,  
ZA, ZM, ZW.

**(84) Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

**Declarations under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

**Published:**

- *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*