Tracing the Effect of the Melanocortin-4 Receptor Pathway in Obesity: Study Design and Methodology of the TEMPO Registry

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Figure 1. The melanocortin-4 receptor signaling pathway, a component of the central melanocortin pathway, plays a vital role in regulating appetite and energy balance, and mutations in this pathway can result in rare genetic disorders of obesity.1,2

Summary
- The TEMPO registry enrolls patients with rare genetic disorders of early-onset severe obesity resulting from genetic variants in the MC4R pathway
- The registry provides insights into the overall course and disease burden of rare disorders of obesity
- Health care providers may use this resource to improve the identification, diagnosis, and treatment of genetic disorders in patients with obesity

Introduction
Rare genetic disorders of obesity characterized by dysfunction of the melanocortin-4 receptor (MC4R) pathway include MC4R, POMC, PCSK1, LEPR, and LEP genetic deficiencies; Bardet-Biedl syndrome; and Alström syndrome.3
- The MC4R pathway, which is a component of the central melanocortin pathway, regulates satiety and energy balance4-6
- Detergent gene mutations in this pathway may result in early-onset severe obesity and insatiable/excessive hunger (Figure 1)5
- Diagnosing, evaluating, and managing genetic disorders of obesity may address unmet treatment needs6

Objective
To evaluate the burden of rare genetic disorders of obesity on participants, caregivers, healthcare providers, and the healthcare system

Study Design and Methodology
The TEMPO Registry
- The TEMPO registry is a voluntary, prospective, open-ended registry of individuals with rare genetic disorders of obesity in which the MC4R pathway is implicated in early-onset severe obesity and insatiable/excessive hunger
- This registry captures data entered by the patient, caregiver, and healthcare provider using electronic survey tools administered at baseline and annually thereafter
- Electronic surveys are HIPAA (Health Insurance Portability and Accountability Act of 1996) compliant

Eligibility and Enrollment
- Eligible participants are referred to the TEMPO study in either of the following ways:
  - Referral by the healthcare provider to coordinating centers
  - Inclusion after positive identification through an industry-sponsored genetic screening study

Baseline
- Following enrollment, baseline electronic surveys are completed
- Health care providers complete the baseline healthcare provider survey tool, reporting patient baseline demographics and disease characteristics
- Patients and caregivers complete their respective baseline survey tools, answering questions on the burden of disease

Baseline surveys collect the following information:
- Demographics
- Medical history
- Pedigree of obesity history
- Genetic testing
- Resource utilization
- Development and education
- Eating habits and hunger
- Social and emotional impact

Annual Follow-ups
- Enrolled patients, caregivers, and healthcare providers are contacted annually by the Registry Coordinating Center to complete an online follow-up survey, which includes a smaller subset of questions from the baseline survey
- The period of follow-up is open ended

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