Moving Research Forward with Patients and Families Affected by GSDIa

GLYCOGEN STORAGE DISEASE
RESEARCH PROGRAMS

ultragenyx

At Ultragenyx, we're intentional in how **we listen to and learn from people living with Glycogen Storage Disease Type Ia (GSDIa)**. Your insights and experiences drive our research programs forward. Learn about how we hope to continue to support the GSD community with our research, and how you can stay informed.

Founded in 2010

Ultragenyx has a long-standing commitment to developing novel treatments for rare and ultra-rare diseases—providing treatments where none previously existed.

Support the Rare Disease Community

Ensure Access

Address Unmet Needs

Designed for Rare Diseases

We recognize that people living with rare diseases and their families are the experts on their conditions. That's why we engage **the GSD community,** in addition to healthcare providers, as partners in advancing research. Community feedback is critical to how we design both our interventional and observational studies.

Phase 3 Study Overview

Now Open!

GlucoGene™
Gene Therapy for the Treatment of GSDIa

About GlucoGene:

- A Phase 3 study designed to determine the safety and efficacy of a **one-time intravenous (IV) infusion of gene therapy**, DTX401, when compared to placebo
- DTX401 is an investigational adeno-associated virus (AAV) gene therapy designed to deliver a functional *G6PC* gene
- The goal of this study is to evaluate if DTX401 can help people with GSDIa maintain or improve blood sugar levels with less or no cornstarch. Additionally, this study will evaluate safety, as well as the ability to improve quality of life

Learn more ▶

Who:

- The study will enroll approximately 50 individuals (ages 8 and older) living with GSDIa who are currently receiving cornstarch regularly as part of their dietary regimen

Where:

- US, Canada, Europe, Latin America, and East Asia

What's involved:

- Patients will receive a single IV infusion of either DTX401 or placebo
- Patients who received placebo will receive DTX401 after 48 weeks, if still eligible
- **All patients should maintain confidentiality of their participation and avoid sharing their experience on social and regular media, including whether or not the individual believes they received placebo or DTX401**

Study visits over approximately 2 years:

- 9 clinic visits that require a 1-2-night stay
- 4 clinic visits
- 16 outpatient/home health visits
- All patients who receive DTX401 will be offered enrollment in an optional long-term follow-up study. Whether or when DTX401 will receive regulatory approval is not known

What to expect:

- Diet Diary
- Continuous glucose monitoring
- Lab tests
- Controlled fasting challenge

Phase 1/2 Study Overview

Enrollment Complete!

DTX401 Phase 1/2 study

Ultragenyx completed a Phase 1/2 study of DTX401 and has presented results at several medical conferences, including the International Congress of Inborn Errors of Metabolism (ICIEM), the American Society of Gene and Cell Therapy (ASGCT), and the European Society of Gene and Cell Therapy (ESGCT).

To learn more about the study, contact our Medical Information team at **medinfo@ultragenyx.com** or **1-888-756-8657**.

Learn more ▶

About the study:

- A global, multicenter, open-label Phase 1/2 study evaluated the safety and preliminary efficacy of a single IV infusion of DTX401 in adults with GSDIa
- The main purpose of the study was to evaluate the safety of DTX401 and to determine the optimal dose to use in a larger randomized, controlled Phase 3 study
- A total of 12 adults with GSDIa were treated with DTX401 and were followed for 52 weeks after dosing. After completion, all participants opted to enroll in a 4-year extension study to evaluate the long-term (a total of 5 years) safety and efficacy of DTX401

Engaging the GSD community to better understand additional research opportunities

Ultragenyx studies put the people who live with GSDIa at the center of our research process.

Survey: Burden of GSDIa | Online survey of adults and adolescents with GSDIa as well as caregivers of adolescents with GSDIa

26 participants completed the survey (11 adults, 9 caregivers, and 6 adolescents).

90% of adults and **66.7%** of caregivers reported being **impacted by lack of sleep**

80% of adults said they were bothered by **weight gain** associated with cornstarch use

72.7% of adults reported **abdominal distention** as the most frequent issue experienced while growing up

Highlights From Survey Results

- **All adolescents and adult respondents had been hospitalized at some point due to GSDIa**
- **All caregivers said their child experienced a hypoglycemic event despite not missing a cornstarch dose**
- **The most challenging aspect of living with someone with GSDIa as a caregiver was maintaining the treatment regimen, the fragility of the condition, the lack of sleep and the emotional impact**
- **Hypoglycemic events were reported as the most important aspect to treat**

Observational Studies

Odyssey Study

Now Open!

> **"Despite a recent wave of medical progress, most rare diseases still have no approved therapies... Information obtained from a natural history study can play an important role at every stage of drug development."**
> – Scott Gottlieb, Former Commissioner, United States Food and Drug Administration (FDA)

- GSD Odyssey is a research study to centralize medical records for patients and create an anonymized data set for researchers to better understand GSD natural history
- Natural history studies, such as the GSD Odyssey Study, **provide important information for regulatory submissions to support potential approval of new therapies.** This is particularly true for rare diseases like GSDIa, where the natural history remains relatively unknown
  – The natural history of a disease is the course a disease takes in the absence of intervention

Study overview:

- Open to adults and children who live in the US with GSDIa and GSD III
- Enroll online, no in-person visits
- Sponsored by Ultragenyx, in partnership with PicnicHealth, a digital health company
- People with GSD who enroll will get access to their complete medical history digitized via the PicnicHealth timeline

Study objectives:

- Understanding the natural history of how GSD progresses and may change over time
- Understanding how GSD is managed in the real world

How does Odyssey work?

Sign up online now in less than 10 minutes and complete an initial survey

PicnicHealth compiles and de-identifies your medical records

Researchers use your de-identified and anonymized data to improve their understanding of GSD to help improve future quality of care

Learn more ▶

Antibody Study

Now Open!

- Observational study of anti-AAV antibodies in people with GSDIa
- AAVs are naturally occurring viruses that are used in gene therapy. People who have been exposed to AAV naturally and have antibodies to the virus may not be able to take AAV-based gene therapies

Who:

- Adults (18 years or older) who live in the US and EU with a diagnosis of GSDIa

Study objective:

- To better understand how many people have been exposed to a virus that is used in gene therapy

Results could help understand:

- How common it is for patients with GSDIa to have antibodies to certain types of AAVs

During a single visit either at home or at the clinic:

- A blood sample will be taken to test whether patients have antibodies to the AAV8 serotype of the AAV virus
- A blood sample will be taken to study the patient's *G6PC* gene

What patients can expect during the study:

- Agreement to participate
- Medical questionnaires
- Genetic testing
- Lab tests

Learn more ▶

Our collective understanding will grow as research evolves

Ultragenyx is committed to ongoing conversations with the GSD community. **We will share findings from our GSDIa studies at an appropriate time after the trials are completed.** Research takes time, so we expect it may be a while until we have information to report.

Help move GSD research forward

Learn more about GSDIa studies

GlucoGene ▶ | Odyssey ▶ | Phase 1/2 study ▶ | Antibody Study ▶

Connect with Patient Advocacy at Ultragenyx

Visit www.UltraRareAdvocacy.com or email PatientAdvocacy@Ultragenyx.com to stay in touch with the Patient Advocacy team and access further information about GSDIa and gene therapy

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