Welcome and Corporate Overview

- Emil Kakkis, M.D., Ph.D.
  President and Chief Executive Officer
Forward Looking Statements

Cautionary note regarding forward-looking statements: This presentation contains forward-looking statements, including, but not limited to, statements regarding our expectations and projections regarding our future operating results and financial performance, anticipated cost or expense reductions, plans with respect to commercializing our product and product candidates, our translational research program, expectations regarding our manufacturing capabilities, the expected timing of release of additional data for our product candidates, plans to initiate additional studies for product candidates and timing and design of these studies, plans regarding ongoing studies for existing programs, our liquidity position as of the most recent fiscal quarter end, expectations regarding the adequacy of clinical data to support marketing applications and approvals of product candidates, our intent to file, and potential timing and success of, marketing applications and other regulatory approvals, expectations regarding timing of receiving potential approval of product candidates, expectations regarding prevalence of patients, future regulatory interactions, and the value to be generated by our pipeline. Such forward-looking statements involve substantial risks and uncertainties that could cause our clinical development programs, future results, performance or achievements to differ significantly from those expressed or implied by the forward-looking statements. Such risks and uncertainties include, among others, our reliance on our third party partner, Kyowa Kirin Co., Ltd., for the supply of Crysvita, fluctuations in buying or distribution patterns from distributors and specialty pharmacies, the transition back to Kyowa Kirin of our exclusive rights to promote Crysvita in the United States and Canada and unexpected costs, delays, difficulties or adverse impact to revenue related to such transition, smaller than anticipated market opportunities for our products and product candidates, manufacturing risks, competition from other therapies or products, uncertainties related to insurance coverage and reimbursement status of our newly approved products, our evolving integrated commercial organization, uncertainties in the regulatory approval process and the timing of our regulatory filings, the uncertainties inherent in the clinical drug development process, including the potential for substantial delays and risk that earlier study results may not be predictive of future study results, risks related to adverse side effects, the ability for us to successfully develop our pipeline product candidates, our ability to achieve our projected development goals in the expected time frames, the potential for any license or collaboration agreement to be terminated, and other matters that could affect sufficiency of existing cash, cash equivalents and short-term investments to fund operations, the availability or commercial potential of our product and product candidates, and our ability to integrate acquired businesses, which are more fully described in our most recent Form 10-Q or Form 10-K under the caption “Risk Factors” and elsewhere in such reports. Any forward-looking statements made by us reflect our current views with respect to future events or to our future financial performance and involve known and unknown risks, uncertainties, and other factors that may cause our actual results, performance, or achievements to be materially different from any future results, performance, or achievements expressed or implied by these forward-looking statements. Accordingly, our actual results may materially differ from our current expectations, estimates, and projections. Given these uncertainties, you should not place undue reliance on these forward-looking statements.

Any forward-looking statements made by us in this presentation speak only as of the date of this presentation and represent our estimates and assumptions only as of the date of this presentation. Except as required by law, we assume no obligation, and we disclaim any intent, to update these statements to reflect actual results.

This presentation concerns commercial products as well as discussion of investigational drugs that are under preclinical and/or clinical investigation and which have not yet been approved for marketing by the U.S. Food and Drug Administration (FDA). They are currently limited by Federal law to investigational use, and no representations are made as to their safety or effectiveness for the purposes for which they are being investigated.
Ultragenyx is leading the future of rare disease medicine
5 commercial programs generating revenue

- **CRYSVITA® burosumab**: Treatment for XLH
- **DOJOLVI®**: Treatment for LC-FAOD
- **Mepsevii®**: Treatment for MPS VII, Sly syndrome
- **Evekezza®**: Treatment for HoFH
9 programs that entered clinical trials have demonstrated clinical success
Ultragenyx is the most productive rare disease company in the industry...
Approvals since IPO exceeds many other successful rare disease companies

<table>
<thead>
<tr>
<th>Company</th>
<th>Years from IPO to 1st approval(^)</th>
<th># of approvals(^) 10y post-IPO</th>
<th># of approvals(^) 15y post-IPO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultragenyx</td>
<td>3</td>
<td>5</td>
<td>8-12*</td>
</tr>
<tr>
<td>BioMarin</td>
<td>4</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Genzyme</td>
<td>5</td>
<td>2</td>
<td>3</td>
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<tr>
<td>Alexion</td>
<td>11</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Alnylam</td>
<td>14</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Vertex</td>
<td>21</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>

\(^\)Approvals for rare disease indications

*Expected based on current pipeline
Key to Our Success

- Clear science that leads to our **higher probability of success** than other companies
- Fastest development in the industry that leads to **efficient spend**
- Experienced management team with track record of novel study designs, new endpoints and rapid regulatory pathways
Innovative approach to commercialization has led to a successful global commercial organization...

- Led commercialization efforts of blockbuster product
- Navigated more launches of 1st ever treatments – including multiple indications with
  - CRYsvita® (burosumab)
  - DOJOLVI®
- Reputation differentiators – with payors, doctors and patient community through compassionate use policy and 100% co-pay Support / Access
- Global Commercial Operations Across North and South America, Europe and Japan
  - Treating patients in ~34 countries
in later-stage programs

<table>
<thead>
<tr>
<th>PHASE:</th>
<th>Treatment for:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Glycogen storage disease type Ia (GSDIa)</td>
</tr>
<tr>
<td>2</td>
<td>MPS IIIA Sanfilippo Type A</td>
</tr>
<tr>
<td>3</td>
<td>Ornithine transcarbamylase (OTC) deficiency</td>
</tr>
<tr>
<td>4</td>
<td>Osteogenesis imperfecta (OI)</td>
</tr>
<tr>
<td>5</td>
<td>Angelman syndrome (AS)</td>
</tr>
<tr>
<td>6</td>
<td>Wilson disease</td>
</tr>
</tbody>
</table>

**Drug modalities:**
- Gene Therapy
- Biologic
- ASO
independent large opportunities with substantial value – and they are all working...

<table>
<thead>
<tr>
<th>Disease</th>
<th>Phase</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteogenesis Imperfecta</td>
<td>Phase 3</td>
<td>Monoclonal Antibody</td>
</tr>
<tr>
<td>~60,000 patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angelman Syndrome</td>
<td>Phase 2</td>
<td>Antisense Oligonucleotide</td>
</tr>
<tr>
<td>~60,000 patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wilson disease</td>
<td>Phase 2/3</td>
<td>Gene Therapy</td>
</tr>
<tr>
<td>~50,000 patients</td>
<td></td>
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## Key Clinical Catalysts

<table>
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<tr>
<th>Program</th>
<th>Objective</th>
<th>Expected Timing</th>
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<tbody>
<tr>
<td><strong>UX143</strong></td>
<td>Phase 2 fracture data</td>
<td><strong>Today!</strong></td>
</tr>
<tr>
<td>Osteogenesis Imperfecta</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GTX-102</strong></td>
<td>Extension &amp; redosing data</td>
<td><strong>Today!</strong></td>
</tr>
<tr>
<td>Angelman Syndrome</td>
<td>Expansion cohort data</td>
<td>1H24</td>
</tr>
<tr>
<td><strong>UX701</strong></td>
<td>Cohort 1 data</td>
<td><strong>Today!</strong></td>
</tr>
<tr>
<td>Wilson Disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cohorts 1-3 data</td>
<td>1H24</td>
</tr>
<tr>
<td><strong>DTX401</strong></td>
<td>Phase 3 unblinding</td>
<td>1H24</td>
</tr>
<tr>
<td>GSDIa</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>UX111</strong></td>
<td>Regulatory discussions on filing</td>
<td>4Q23</td>
</tr>
<tr>
<td>MPS IIIA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Increased **financial discipline** over last 18 months to **drive priority programs**…

- Realigned headcount to **maximize efficiency**
- Focus investment on key value drivers
- Multiple late-stage – large opportunities
Strong revenue growth and decreasing cash use
Pathway to profitability in 2026 driven by new product approvals and continued operational leverage
Multi-modality allows for independent value creation with the right technology.

A moment in time.

The future of rare disease medicine is here.

- Major catalysts coming for key programs
- Within 2-3 years expect multiple new product approvals
- Revenue projected to exceed $1B with a path to profitability
UX143 for Osteogenesis Imperfecta
Phase 2 Clinical Study Update

• Eric Crombez, M.D.
Chief Medical Officer
Disclaimers

UX143 is an investigational drug and is not approved by any regulatory authority

The data presented here are open-label interim data and do not provide definitive conclusions on efficacy or safety
UX143 Setrusumab for Osteogenesis Imperfecta

- OI is a severe bone disease with high unmet need
  - No approved treatments
  - Bisphosphonates used off label with modest effect

- Prevalence of three OI types I/III/IV*
  - ~60,000 patients, more than XLH

- UX143 Setrusumab
  - Anti-sclerostin fully human antibody candidate
  - Improved bone mass and bone strength in preclinical OI models

- Status
  - Ongoing enrollment in pivotal Orbit Phase 2/3
  - Ongoing enrollment in supportive Cosmic Phase 3

- Today
  - Presentation of 6 months of bone mineral density and fracture data from the ongoing Phase 2

*prevalence in Ultragenyx commercial regions

Recruiting more bone cells to produce more bone at the places where strength is needed

Adapted from Ominsky et al. (Ominsky et al., 2017).
UX143-CL301 Phase 2 Study Design

Phase 2 is designed to select a setrusumab dosing strategy based on PK/PD, safety, and available BMD data in patients with OI.

- **24 patients** with OI Types I, III, or IV and a confirmed COL1A1 or COL1A2 mutation enrolled in Phase 2.

- **Phase 2** includes patients 5 to < 26 years of age and intended to enroll 12 patients with body weight ≤ 30 kg.

- Randomization ratio 1:1 to 20 mg/kg or 40 mg/kg of setrusumab administered IV QM.

- Randomization stratified by number of fractures in the previous 2 years (≤ 3 vs > 3) and age group:
  - 5 to < 12 years
  - 12 to < 18 years
  - 18 to < 26 years
67% Reduction in Fracture Rate After at Least 6 Months of Treatment
Associated with continuous and meaningful improvements in bone mineral density (BMD)

Much lower incidence of fractures post-treatment vs. pre-treatment
• All patients (n=24) had at least 1 fracture (22/24 were radiographically confirmed) pre-treatment
• 20/24 (83%) had no radiographically confirmed fractures after at least 6 months of treatment

Dramatic reduction in radiographically confirmed fracture rate post treatment
• Median pre-treatment annualized fracture rate (AFR) of 0.72 was reduced to 0.0 (p=0.042) post-treatment

Significantly increased lumbar spine BMD and BMD Z-score from baseline
• 6M BMD % change from baseline of 14.19% (mean, n=19) and Z-score change of +0.85
• Greatest improvements for ages 5 to <12: 19.64 % change from baseline (mean, n=8)
Increase in Lumbar Spine BMD and Z-score Observed at Month 6

- No significant differences were observed between setrsumab dose groups (p value for comparison >0.05)
  - % change in BMD at M6, 20 mg/kg group=13%, 40 mg/kg group=16%
  - Change in BMD Z-score at M6: both dose groups = +0.85
In 5 to <12 year olds, nearly 20% increase in BMD with Z-score change of +1.19
67% Reduction in AFR Observed Post-Treatment with Setrusumab

- Median total confirmed AFR post-treatment was 0.0
- 67% reduction in annualized fracture rate, excluding fingers, toes, face, and skull
  - Mean treatment duration of 9 months (6 - 16 months) in 24 patients as of data cut

Radiographically Confirmed Fractures

Median Annualized Fracture Rate

<table>
<thead>
<tr>
<th></th>
<th>Pre-Treatment*</th>
<th>After Setrusumab Initiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 3 Endpoint</td>
<td>0.72</td>
<td>0.0</td>
</tr>
<tr>
<td>Total Fractures</td>
<td>1.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

*Pre-Treatment period includes fractures in the two years before screening based on medical record review and patient report, and fractures between screening and first dose.
20/24 Patients Did Not Have Radiographically Confirmed Fractures After Treatment with Setrusumab

• 20/24 patients had no radiographically confirmed fractures despite meaningful historical fracture rates

Radiographically Confirmed Fractures

Patients without Confirmed Fractures by Month 6

Patients with Confirmed Fractures by Month 6

A. Slipped on ice (2 fractures) [at 1.6 mo]; stubbed toe [at 6 mo]
B. Fell off tricycle (2 fractures) [at 5.5 mo]
C. Bending over in bed [at 1.1 mo]
D. Tripped and fell on hand [at 7.7 mo]
Some Major Traumatic Events Occurred Without Fractures

High-impact motor vehicle accident at Month 5.5 of treatment resulted in **no fractures**

- Patient “walked away unscathed” from accident totaling both cars

Patient fell down a flight of stairs at Month 4.7 of treatment **Evaluated: No fractures**

- (Not the actual stairs)
- Patient’s bruised knee after fall
Patient with Increased Mobility After 17 Months on Study

6-year-old male with Type IV OI
Interim Safety Evaluation

<table>
<thead>
<tr>
<th>No treatment-related SAEs</th>
<th>No unexpected adverse events or safety concerns</th>
<th>No patient discontinued treatment for any adverse event</th>
<th>No drug-related hypersensitivity reactions</th>
</tr>
</thead>
</table>

### Most Common Adverse Events Reported

<table>
<thead>
<tr>
<th>Adverse Event</th>
<th>Phase 2 Patients (N=24)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infusion-related event (not hypersensitivity)</td>
<td>7 (29%)</td>
</tr>
<tr>
<td>Headache</td>
<td>3 (13%)</td>
</tr>
<tr>
<td>Abdominal discomfort</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Infusion site pain</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Bone pain</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Upper respiratory tract infection</td>
<td>1 (4%)</td>
</tr>
</tbody>
</table>

Safety update as of August 04, 2023
**Orbit: CL301 Phase 3**

Phase 3 is designed to evaluate the efficacy and safety of setrusumab vs placebo in patients with OI.

Approximately 195 patients 5 to < 26 years of age with OI Types I, III, or IV and a confirmed COL1A1 or COL1A2 mutation will be enrolled in Phase 3.

Phase 3 patients will be randomized 2:1 to receive setrusumab (at the selected dosing strategy from the Phase 2 analysis) or placebo administered IV QM.

Primary efficacy endpoint: **annualized clinical fracture rate**

The Phase 3 treatment period is double-blind with respect to patients, Investigators and Ultragenyx.
Conclusions and Next Steps

67% reduction in annualized fracture rate over 6 months
• Significantly increased lumbar spine BMD and BMD Z-score from baseline
• Improvements in bone strength without having to directly correct collagen defects

Higher pre-treatment fracture rate and larger treatment effect size could enable a faster path to study readout
• *Orbit* study updates in process that may accelerate timeline pending health authority agreement
• Two interim analyses added to statistical analysis plan to evaluate for overwhelming efficacy

Actively enrolling *Orbit* and *Cosmic* Phase 3 studies
• *Orbit* is enrolling at 50 sites in 12 countries
• *Cosmic* is enrolling at 22 sites in 8 countries

Expect further Phase 2 data update in 2024
Osteogenesis Imperfecta KOL Panel

- Heather Byers, M.D.
  Ultragenyx Lead Physician, UX143
Osteogenesis Imperfecta KOL Panel

**Thomas Carpenter, M.D.**
- Professor of Pediatrics (Endocrinology) and of Orthopaedics and Rehabilitation and Clinical Professor of Nursing
- Director, Yale Center for X-Linked Hypophosphatemia
- Principal investigator for UX143 Phase 3 program

**Gary Gottesman, M.D.**
- Professor of Pediatrics and Medicine, Washington University School of Medicine in St. Louis
- Previously, Medical Geneticist in the Center for Metabolic Bone Disease and Molecular Research at Shriners Hospital
- Principal investigator for UX143 Phase 3 program
GTX-102 for Angelman Syndrome Phase 1/2 Data Update

- Emil Kakkis, M.D., Ph.D.
  President and Chief Executive Officer
Disclaimers

GTX-102 is an investigational drug and is not approved by any regulatory authority

The data presented here are open-label interim data and do not provide definitive conclusions on efficacy or safety
GTX-102 for Angelman Syndrome (AS)
Antisense oligonucleotide (ASO) activates UBE3A

- Devastating neurodevelopmental disorder
- Prevalence*: ~60,000
- No approved treatments
- Phase 1/2: enrolling and dosing expansion cohorts
- Targeting highly conserved region across multiple species

*Prevalence in commercially accessible geographies
## GTX-102 Phase 2 Update

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Multiple domains improved in Loading and Maintenance Phase compared to natural history, where available</td>
</tr>
<tr>
<td></td>
<td>Clinical changes associated with quantitative changes in EEG</td>
</tr>
<tr>
<td></td>
<td>Extension cohorts and redosed patients have demonstrated clinically meaningful changes in quantitative scores and in emerging developmental gains as reported by caregivers</td>
</tr>
<tr>
<td></td>
<td>Discuss video examples of improvements</td>
</tr>
</tbody>
</table>
## Key Angelman Syndrome Domain Evaluations

<table>
<thead>
<tr>
<th>Domains</th>
<th>Evaluation</th>
<th>Natural History Comparison¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognition</td>
<td>Bayley-4</td>
<td>Yes</td>
</tr>
<tr>
<td>Sleep</td>
<td>Angelman Severity Assessment for Sleep (ASA)</td>
<td>--</td>
</tr>
<tr>
<td>Receptive Communication</td>
<td>Bayley-4</td>
<td>Yes</td>
</tr>
<tr>
<td>Behavior</td>
<td>ASA for Behavior</td>
<td>--</td>
</tr>
<tr>
<td>Gross Motor</td>
<td>Bayley-4</td>
<td>Yes</td>
</tr>
<tr>
<td>Overall</td>
<td>ASA for Overall</td>
<td>--</td>
</tr>
</tbody>
</table>

¹: Not available for all endpoints and shown as representative comparisons
Angelman Severity Assessment (ASA) Rating Scales

ASA rate the severity of the patient’s symptoms

The ratings are:

- 1 – Not at all impaired
- 2 – Borderline, slightly impaired
- 3 – Mildly impaired
- 4 – Moderately impaired
- 5 – Markedly impaired
- 6 – Severely impaired
- 7 – Among the most severely impaired

Most patients are between mildly and severely (3 and 6) impaired at baseline

Each ASA domain rating scale is anchored to 6-8 questions specific to Angelman disease severity

A decrease in score represents an improvement or lessening severity
Interim Phase 2 Data on Extension Cohorts

Cohorts 4-7
Enrolled outside of the U.S.
n=15 patients

Loading doses from 3.3 - 7.5 mg
Maintenance from 10 - 14 mg

11 patients on therapy greater than 12 months, with the longest approaching 2 years

No additional events of lower extremity weakness or other safety signals
Study Dosing Schematic for GTX-102

*Loading phase through Day 254*

- **Baseline Evaluation**
- **Day 58 Evaluation**
- **Day 128 Evaluation**
- **Day 254 Evaluation**

- *Doses 1 to 6*

- **Month 1**
- **Month 2**
- **Month 3**
- **Month 4**
- **PMD1**
- **PMD2**
- *...*

---

**Monthly loading doses**

**Maintenance dosing every 3 months**

PMD: Pre-maintenance Dose
Natural History as Comparator for GTX-102 Phase 2 Data
Comparable to GTX-102 study population age and genotype

Data from the Angelman Natural History study\(^2\) is used as a comparator for the treatment effect size observed with GTX-102\(^1\)

Bayley-4 Cognition, Receptive Communication, and Gross Motor scores were compared across GTX-102 treated and natural history patients\(^2\)

- 64 patients with deletion-type AS
- Ages 4 to 17 years
- At least 2 consecutive assessments

\(^1\)Sadhwani et al., 2021; Keute et al., 2021; Gentile et al., 2010
\(^2\)Linking Angelman and Dup15q Data for Expanded Research (LADDER)
Cognition by Bayley-4 Improved Rapidly Compared to Natural History

GTX-102 treated patients showed positive response at Day 254

Bayley-4 Cognition GSV LS Mean (SE)

Response threshold of ≥5 based on Bayley-4 administration manual
The estimated values are from a GEE model which includes all available data as the dependent variable and baseline age as a covariate, with exchangeable correlation structure.
EEG Showed Rapid Positive Change for Patients on GTX-102

Reduction in delta relative power while awake correlated with improvement in Bayley-4 Cognition scores

Natural History EEG data shows pathologically increased relative delta power (den Bakker et al., 2018)

Relative delta power reliably predicts cognitive function, as assessed by the Bayley (Ostrowski et al., 2021)
Sleep by Angelman Severity Assessment (ASA) Scores Improved in Parallel with Increased Sleep Spindle Duration on EEG

Receptive Communication by Bayley-4 Improved Rapidly Compared to Natural History

GTX-102 treated patients showed positive response at Day 254 compared with natural history at Day 730.

<table>
<thead>
<tr>
<th>Patients</th>
<th>Bayley-4 Receptive Communication GSV LS Mean (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>128</td>
</tr>
<tr>
<td>12</td>
<td>254</td>
</tr>
</tbody>
</table>

Response threshold of ≥6 based on Bayley-4 administration manual. The estimated values are from a GEE model which includes all available data as the dependent variable and baseline age as a covariate, with exchangeable correlation structure.
Behavior by Angelman Severity Assessment (ASA) Showed Clinically Meaningful Changes

ASA-Behavior improved with GTX-102 through Day 254

Behavior Improvements anchored by changes in:
- Focus/Overexcitability
- Maladaptive Behavior
- Transitions
- Impulsivity

The estimated values are from a GEE model which includes all available data as the dependent variable and baseline age as a covariate, with exchangeable correlation structure.
GTX-102 Maintenance Phase
Cognition by Bayley-4 Continued to Improve During Maintenance Phase

GTX-102 treated patients showed positive response through Day 506

*Doses at D506 between 10mg and 14mg

Response threshold of ≥5 based on Bayley-4 administration manual.

The estimated values are from a GEE model which includes all available data as the dependent variable and baseline age as a covariate, with exchangeable correlation structure.
Cognition by Bayley-4 Showed Rapid and Sustained Improvement Correlating with Positive EEG Change

GTX-102 treated patients showed positive response that continues after Day 422

Relative delta power reliably predicts cognitive function, as assessed by the Bayley, in patients with AS (Ostrowski et al., 2021)

Receptive Communication by Bayley-4 Showed Sustained Improvement During Maintenance

Treated patients showed sustained improvements through Day 506

Natural history through Day 730

Response threshold of ≥6 based on Bayley-4 administration manual.
The estimated values are from a GEE model which includes all available data as the dependent variable and baseline age as a covariate, with exchangeable correlation structure.
Gross Motor by Bayley-4 Showed Continued Improvement Compared to Natural History

Gross Motor Bayley-4 showed steady improvement through Day 506

<table>
<thead>
<tr>
<th>Day</th>
<th>Patients</th>
<th>Bayley-4 Gross Motor GSV LS Mean (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>128</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>254</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>338</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>422</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>506</td>
<td>8</td>
<td>5</td>
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</tbody>
</table>

Natural history through Day 730

<table>
<thead>
<tr>
<th>Day</th>
<th>Patients</th>
<th>Bayley-4 Gross Motor GSV LS Mean (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>64</td>
<td>0</td>
</tr>
<tr>
<td>365</td>
<td>61</td>
<td>1</td>
</tr>
<tr>
<td>506</td>
<td>47</td>
<td>2</td>
</tr>
<tr>
<td>730</td>
<td>47</td>
<td>3</td>
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</table>

Response threshold of ≥5 based on Bayley-4 administration manual.
The estimated values are from a GEE model which includes all available data as the dependent variable and baseline age as a covariate, with exchangeable correlation structure.
Sleep by ASA Show Continued Improvement During Maintenance

The estimated values are from a GEE model which includes all available data as the dependent variable and baseline age as a covariate, with exchangeable correlation structure.

ASA-Sleep improved for patients treated with GTX-102 through Day 506

The estimated values are from a GEE model which includes all available data as the dependent variable and baseline age as a covariate, with exchangeable correlation structure.
Behavior by ASA Showed Continued Improvement During Maintenance

ASA-Behavior severity decreased with GTX-102 through Day 506

The estimated values are from a GEE model which includes all available data as the dependent variable and baseline age as a covariate, with exchangeable correlation structure.
Overall Angelman Severity Assessment (ASA) Score Continued to Improve During Maintenance

The estimated values are from a GEE model which includes all available data as the dependent variable and baseline age as a covariate, with exchangeable correlation structure.
Multi-Domain Responder Index (MDRI) to Tabulate Clinically Meaningful Changes Across Diverse Functional Domains

Choose 4-6 important clinical domains
• Sleep, behavior, receptive communication, gross motor, cognition

Score each patient on each domain
• Change assessed on Minimal Important Difference (MID)
  • >1 MID = +1 ; <1 to >-1 = 0 ; <-1 MID = -1

Only count the significant changes that exceed the MID
• Filter out small changes: no disease/no effect or no measure

Captures more potential points of benefit by assessing the “totality of the data”
Multi-Domain Responder Index (MDRI) Captures Broad Clinical Benefit Across Five Domains in Patients Treated with GTX-102

<table>
<thead>
<tr>
<th>Patient (n=11)</th>
<th>ASA Sleep</th>
<th>ASA Behavior</th>
<th>Bayley-4 Receptive Comm</th>
<th>Bayley-4 Gross Motor</th>
<th>Bayley-4 Cognition</th>
<th>Total Net Responses*</th>
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Minimal Important Difference (MID)

- ASA-Sleep +/- 1
- ASA-Behavior +/- 1
- Bayley-4 Receptive Communication +/- 6
- Bayley-4 Gross Motor +/- 5
- Bayley-4 Cognition +/- 5

Median Total Net Responses +2
Net Responses ≠ 0 p** = 0.001

** P-value is from a sign test

*Day 338
Quantitative Analysis of Multiple Domains Showed Meaningful Improvement

**Improvements far exceeding natural history**
- Cognition
- Receptive Communication
- Gross Motor

**Improvements in other important domains**
- Sleep
- Behavior

**Supportive data from**
- EEG delta power and sleep spindle

**Powerful change in multiple domains as demonstrated by MDRI**
Interim Safety Evaluation including Extension and Expansion Cohorts

No patients with lower extremity weakness events since Nov 2022

3 patients discontinued treatment for non-serious adverse events

No unexpected adverse events or safety concerns

Patients have received up to 11 doses of GTX-102

<table>
<thead>
<tr>
<th>Most Common Adverse Events Reported</th>
<th>Phase 1/2 Patients (n=58)</th>
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<tbody>
<tr>
<td>Vomiting (anesthesia related)</td>
<td>18 (31%)</td>
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<tr>
<td>Pyrexia (Fever)</td>
<td>10 (17%)</td>
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<tr>
<td>Nasopharyngitis</td>
<td>8 (14%)</td>
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<tr>
<td>Coronavirus infection</td>
<td>6 (10%)</td>
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<tr>
<td>Fall</td>
<td>5 (9%)</td>
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<tr>
<td>Post-lumbar puncture syndrome</td>
<td>5 (9%)</td>
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</table>

Safety data as of October 3, 2023

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Next Steps Phase 2 Expansion Cohort Update

- >30 patients enrolled across Cohorts A-E (Expansion Cohorts)
- 25 sites active across 8 countries
- No new lower extremity weakness
- Next data update planned for at least 20 patients with 6 months of data by 1H24

Expected FDA interactions in early 1Q24 to discuss Phase 3 endpoints
Panel Discussion on GTX-102 for the Treatment of Angelman Syndrome

- Kemi Olugemo, M.D., FAAN
  Ultragenyx Lead Physician, GTX-102

- Elizabeth Berry-Kravis, M.D., Ph.D.
  Professor, Dept of Pediatrics
  Rush University Medical Center
  Principal Investigator for GTX-102 Phase 1/2
Redosing of Three Original Patients
### Emergence of New Developmental Skills Gained, Lost and Regained

<table>
<thead>
<tr>
<th>Skill</th>
<th>Patient A</th>
<th>Patient B</th>
<th>Patient C</th>
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<td><strong>Receptive Communication</strong></td>
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<tr>
<td>Responds to name</td>
<td>No issue</td>
<td>No issue</td>
<td>No issue</td>
</tr>
<tr>
<td>Follows 1-step directions</td>
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</tr>
<tr>
<td>Follows 2-step or complex directions</td>
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<tr>
<td><strong>Expressive Communication</strong></td>
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<tr>
<td>Babble/consonant sounds</td>
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<tr>
<td>Communicate wants or needs (gesture/device)</td>
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<td>Identifies or requests object(s)</td>
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<tr>
<td>Multiple words</td>
<td>Skill gained</td>
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<td>Skill lost</td>
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<td><strong>Behavior</strong></td>
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<tr>
<td>Alertness</td>
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<tr>
<td>Reduced hyperactivity</td>
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<td>Reduced disruptive behavior or irritability</td>
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<td>Reduced mouthing behavior</td>
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<tr>
<td><strong>Sleep</strong></td>
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<tr>
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<tr>
<td>Less frequent awakenings</td>
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<tr>
<td><strong>Fine Motor</strong></td>
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<tr>
<td>Pincer grasp</td>
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<tr>
<td>Opening/closing doorknobs, lids</td>
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<td><strong>Gross Motor</strong></td>
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<td>Throwing/catching a ball</td>
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<td>Walking up stairs or reciprocal climbing</td>
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<td>Swimming independently</td>
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**Key**
- **Skill gained**
- **Issue, but no change**
- **Skill lost**
# Emergence of New Developmental Skills Gained in Cohorts 4 to 7

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Closed Session: Videos Played In Room Only
Break
Gene Therapy Clinical Overview

- Eric Crombez, M.D.
  Chief Medical Officer
### Largest Advanced Gene Therapy Portfolio in Rare Disease

<table>
<thead>
<tr>
<th>Candidate</th>
<th>Description</th>
<th>Pre-Clinical</th>
<th>IND</th>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
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</table>
DTX401 for Glycogen Storage Disease Type Ia
*Phase 3 fully enrolled with data in 1H24*

**Disease Overview**
- Dysregulation of glycogen metabolism
- SOC: Diet and cornstarch
- Prevalence*: 6,000

**Phase 1/2 Data Summary**
- 4+ years data
- 100% response rate
- 66% reduction of cornstarch
- No serious related TEAEs

**Phase 3 Design**
- ~50 patients, 1:1 placebo randomized
- 48-week duration
- Cornstarch reduction and control

**Next Steps**
- Phase 3 fully enrolled in 1Q23
- Phase 3 data in 1H24

*Prevalence in commercially accessible geographies*
UX111 for Sanfilippo syndrome (MPS IIIA)

Pivotal study fully enrolled, regulatory interactions for accelerated approval ongoing

**Disease Overview**
- Defect in heparan sulfate metabolism
- SOC: Supportive / symptomatic therapy
- Prevalence*: ~3,000 - 5,000

**Phase 1/2 Transpher A Design**
- 16 patients; 10 at highest dose
- Open label study up to 5 years of age

**Phase 1/2 Transpher A Result**
- Highest dose patients track along normal development range
- Observed stabilization in brain volume and reduction in liver volume
- Significant reduction in CSF heparan sulfate and urine GAGs

*Prevalence in commercially accessible geographies

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DTX301 for Ornithine Transcarbamylase Deficiency (OTC)
Phase 3 enrolling with LPI expected in 1H24

Disease Overview
• Defect in ammonia detoxification
• SOC: Diet and ammonia scavengers
• Prevalence*: ~10,000, 80% late-onset

Phase 1/2 Data Summary
• Up to 5.5 years of observed response
• 7 out of 11 showed metabolic control
• No treatment related SAEs

Phase 3 Design
• ~50 patients, 1:1 placebo randomized
• 64-week duration
• Ammonia control and discontinuation of SOC

Next Steps
• Phase 3 dosing began in 1Q23
• Phase 3 LPI expected in 1H24

*Prevalence in commercially accessible geographies
UX701 for Wilson Disease: Pinnacle PCL Product Candidate

Stage 1 enrolling with LPI expected around the end of the year

Disease Overview

- Dysregulation of copper trafficking
- SOC: Diet and copper chelators / zinc
- Prevalence*: ~50,000

Manufacturing Scale

- Leverages Pinnacle PCL™ platform
- Single run supported Stage 1 dosing

Phase 1/2 Design

- 3 dose cohorts, 5 pts/cohort; open label
- 52-week duration
- Safety and tolerability, copper metabolism biomarkers, and reduction of SOC

Phase 3 Design

- Seamless transition from Ph1/2
- 63 patients, 2:1 placebo randomized
- 52-week duration
- Urinary copper and reduction of SOC

*Prevalence in commercially accessible geographies
UX701 for Wilson Disease

Four of five Cohort 1 patients tapering SOC, including two completely off chelators and/or zinc therapy

<table>
<thead>
<tr>
<th>Cohort 1</th>
<th>Weeks on Study</th>
<th>Reduction of SOC [Chelator and/or zinc therapy]</th>
<th>Copper Trafficking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient 1</td>
<td>82</td>
<td>0%</td>
<td>Indeterminate</td>
</tr>
<tr>
<td>Patient 2</td>
<td>70</td>
<td>100%</td>
<td>Reduced urinary copper and improved trafficking by copper oxidase assay</td>
</tr>
<tr>
<td>Patient 3</td>
<td>44</td>
<td>100%</td>
<td>Reduced urinary copper and improved trafficking by copper oxidase assay</td>
</tr>
<tr>
<td>Patient 4</td>
<td>20</td>
<td>33%</td>
<td>Reduced urinary copper; pending trafficking assessment</td>
</tr>
<tr>
<td>Patient 5</td>
<td>16</td>
<td>50%</td>
<td>Reduced urinary copper; pending trafficking assessment</td>
</tr>
</tbody>
</table>

Data as of October 8, 2023

SOC reduction initiates 12-weeks after dose

No infusion related reactions and no serious TEAEs

Cohort 2 dosing completed; all patients in Cohort 3 screened

Stage 1 data on three cohorts expected in 1H24

(1) Steroid regimen given from Day 1 to Day 60 post-dose, including taper
Gene Therapy
Pinnacle PCL Platform Overview

- Dennis Huang
  Chief Technical Operations Officer
  EVP, Gene Therapy R&D
Ultragenyx has Developed Multiple GT Manufacturing Processes
Each process optimized to match target indication

HEK293 Suspension

- DTX401; DTX301
- 4 x 500 L

PINNACLE PCL

- UX701; UX055; UX810
- 2000 L

Future of Gene Therapy Manufacturing

- Reduced cost to manufacture
- Faster and more predictable supply during the full drug lifecycle

Enables

- Greater worldwide patient access
- Ability to use larger doses which could enable extra-hepatic delivery
- Address larger market opportunities
Pinnacle Platform Improves Speed and Provides Greater Control Over Quality and Cost

Manufacturing facility in Bedford, MA

Gene Therapy Internal Capabilities

• Full gene therapy R&D capabilities with 500L Pilot Plant
• GMP QC laboratories (2019)
• GMP manufacturing facility (2023)
  • 110,000 sq ft
  • Drug substance
  • Drug product
  • Multi-product design
  • 2000L single use bioreactors
# Pinnacle PCL Enables Treating Large and Extrahepatic Indications

## Comparison Table

<table>
<thead>
<tr>
<th>Scale</th>
<th>HEK293</th>
<th>PINNACLE PCL™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adherent 500m²</td>
<td>Commercial scale 2000L+</td>
<td></td>
</tr>
<tr>
<td>Suspension 500L or higher</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Process</th>
<th>HEK293</th>
<th>PINNACLE PCL™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triple plasmid transient transfection &amp; more variable at commercial scale</td>
<td>Stable cell line, robust process</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quality</th>
<th>HEK293</th>
<th>PINNACLE PCL™</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-25% full capsids from the bioreactor</td>
<td>50-70% full capsids from the bioreactor</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost of MFG</th>
<th>HEK293</th>
<th>PINNACLE PCL™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditionally high, worsened by lower scale and cost of GMP plasmids</td>
<td>Substantially lower MFG costs due to scale, high yield, inexpensive reagents</td>
<td></td>
</tr>
</tbody>
</table>
Pinnacle Producer Cell Line (PCL) Delivers High Titer and Commercial Grade Material

Stable Transfection of Rep/Cap and gene of interest into Producer Cells

AAV production is initiated with addition of Ad5 to the bioreactor

Downstream processing to purify final drug product
Productivity Improved Enabling Larger scale Clinical Programs Including UX701 for Wilson Disease

- Low cell density; DTX201 Titer: ~5 E8 GC/mL
- 100x increase for DTX201
- Additional 4x increase in yield for Wilson disease
- 50% yield increase from prior process for CDKL5
APEX (AAV Perfusion Enhanced eXpression) PCL Manufacturing Process Overcomes Batch Mode Limitations

### Cell Density in Bioreactor

- **Intensified:**
  - 250 L
  - 50 L
  - 2 L
  - 250 mL

- **Control:**
  - 2 L

5X Cell Density achieved relative to batch culture.

### Volumetric AAV Yield

- **3.5X Productivity**
  - relative to batch, scaled to 250L

### Benefits of APEX Process

- **Engineering control** over a historically “black box” production process
- Designed to operate at **2000L + scale**
- Perfusion rate can be customized to maintain very high cell density, accommodates high clinical supply for **larger patient populations**
- **Significantly lower COGS** changes the business model for AAV gene therapy products
Recent Advancements Enable Manufacture for Large Market Indications

Higher productivity allows for lower COGS, moderated pricing, and biologic margins

Productivity

2015 2017 2019 2021 2022 2023

100 Fold Increase

20+ Fold+ Increase
Pinnacle PCL is a Transformative AAV Manufacturing Technology

*Enables treating with high dose or larger indications*

Liver

Neurologic

Musculoskeletal

Pinnacle PCL platform offers the titer and quality at a lower cost to address these diseases with responsible commercial pricing.
Standardizing key technology platforms has led to faster regulatory approvals and access for patients

- Monoclonal antibody therapeutics – Mammalian CHO (1990-2000's)
- mRNA – COVID vaccines (2020's)

Pinnacle PCL Platform has the right characteristics and maturity to be the AAV Gene Therapy manufacturing standard

- Clinically validated
- Cost effective
- Efficient development timelines
- Scalable and reliable
- High quality
- IP protected
A Novel Gene Therapy Therapeutic Approach to Targeting Beta-amyloid

- Emil Kakkis, M.D., Ph.D.
  President and Chief Executive Officer
Executive Summary: The Use of a Lysosomal Enzyme to Reduce Aβ42

- Galactosialidosis (UX004) studies have led to an important discovery:
  - **Protective Protein/Cathepsin A (PPCA) is a protease that can cleave Aβ42**

- Alzheimer’s is complex, but the role of amyloids is resurgent due to Mab success & approvals

- Alzheimer’s and Lysosomal Diseases share many parallels

- Ultragenyx research working with Dr. D’Azzo has shown that PPCA has special properties:
  - PPCA cleaves amyloid at is C terminus and prevents aggregation *in vitro*
  - Delivery of PPCA to the lysosome via an AAV gene therapy can prevent, reduce or reverse amyloid accumulation in the most severe 5xFAD mouse models of AD

- A special purpose vehicle was proposed to finance the progression of this high-risk, high return project that is beyond the accepted scope of Ultragenyx
Amyloid Hypothesis Validated, but Room to Improve Remains

Recent approvals show amyloid’s importance; relevance of lysosome to AD increasing

- Amyloid hypothesis has become predominant theory with promise to treat AD, but story is complicated

- Recent approvals of Mab against Aβ42 show amyloid matters but efficacy still is modest
  - (-27% decrease in rate of still continuing decline)

- Recent insights by scientists indicate growing association of amyloid disorders with the lysosome
Lysosomal Diseases Share Many Pathologic Features with AD
Various lysosomal diseases show Alzheimer biology and Aβ42 plaque accumulation

Alzheimer’s Disease and Lysosomal Diseases have similar pathologic features as they are actually related diseases

Types of Protein Accumulation and Associated Diseases

<table>
<thead>
<tr>
<th>Protein Accumulation</th>
<th>Associated Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aβ-amyloid plaque</td>
<td>Sialidosis, Gaucher, CLN2 (Batten)</td>
</tr>
<tr>
<td>α-synuclein</td>
<td>Parkinson’s, MPSIIIA and B</td>
</tr>
<tr>
<td>Proteo-lipid amyloid</td>
<td>Tau</td>
</tr>
<tr>
<td>Tau</td>
<td>MPSIIIB</td>
</tr>
</tbody>
</table>

(b) K Ohmi, L Kudo, S Ryazantsev, H Zhao, S Karsten, E F Neufeld, “Sanfilippo syndrome type B, a lysosomal storage disease, is also a tauopathy”; PNAS, 2009
Is There Direct Evidence of Lysosomal Involvement in AD?

Alzheimer's brains at autopsy indicate maximal lysosomal upregulation

Lysosomal function is maximally induced in AD brain\(^a,b\)

Implies that AD pathology is consistent with a lysosomal / endosomal dysfunction that cannot compensate for accumulating protein storage

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Marker for lysosomal activation

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**Neurons from AD Brain**

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PPCA Enzyme Supplementation as Potential Solution

Lysosomal enzyme to degrade hydrophobic peptides that form beta-pleated sheet structures

PPCA is a carboxypeptidase with specificity for hydrophobic amino acid cleavage including the amino acids at the C-terminus of APP and Aβ42

PPCA recruits endogenous NEU1, which regulates lysosomal exocytosis and lengthens digestion time

The combination of more protease activity and delayed exocytosis can reduce excess Aβ42
PPCA Selectively Degrades Aβ42 and Prevents Oligomer Assembly

PPCA targets the C-terminus of Aβ42 and degrades/prevents assembly of larger oligomers.

PPCA cleaves the C-terminus of Aβ42 that leads to amyloid disaggregation and prevents further oligomerization.

Aβ42 sequence

DAEFRHDSGYEVHHQKLVFFAEDVGSNKGAIGLMVGGVVIA

Potential target for PPCA hydrolysis

Verified C-terminal truncations after PPCA cleavage of Aβ42

<table>
<thead>
<tr>
<th>Aβ42 peptide</th>
<th>Verified C-terminal truncations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aβ42</td>
<td>DAEFRHDSGYEVHHQKLVFFAEDVGSNKGAIGLMVGGVVIA</td>
</tr>
<tr>
<td>C-terminal truncations</td>
<td></td>
</tr>
<tr>
<td>..DAEFRHDSGYEVH</td>
<td></td>
</tr>
<tr>
<td>..DAEFRHDSGYEVHQKL</td>
<td></td>
</tr>
<tr>
<td>..DAEFRHDSGYEVHQK</td>
<td></td>
</tr>
</tbody>
</table>

Amyloid Aggregation Assay

PPCA Digestion Assay
AAV-PPCA in 5xFAD Mice Shows Strong Therapeutic Effect

Significant reduction in the volume of Aβ42 plaques

**Experimental design**

- Intracranial infusion of 1e12 total VG, AAV-PPCA
- Mice (5xFAD) dosed at 14 weeks of age
- In life duration was 3 months, study end at 26 weeks of age

**Amyloid reduction**

- % brain area containing amyloid
- Baseline, Control, PPCA
AAV-PPCA in 5xFAD Mice Shows Strong Therapeutic Effect
AAV-delivery of PPCA in treated brain shows dramatic amyloid clearance

Near complete reversal in some mice

AAV-delivered supplementation of PPCA (Green) in treated brain shows significant reduction of amyloid (Red, right panels)
Immunohistochemistry staining shows PPCA’s ability to cross-correct and dramatically reduce amyloid accumulation.

Vehicle

PPCA-treated

Red – Amyloid  Green - PPCA
PPCA Supplementation Reduces Amyloid via the Lysosome

Demonstration that Aβ42 plaque possesses an obligate step through the lysosome

**Key Novel Insight:**

Delivery of a lysosomal protease that is active only **inside** the lysosome is reducing the Aβ42 plaque accumulation **outside** the cell

---

Plaque outside the cell directly results from an **upstream lysosomal process**

Connects the “toxic intracellular oligomers” with the lysosome
Enzymatic vs Antibody Approach: Which is Better?

Catalytic proteolysis with PPCA enables greater levels of Aβ42 degradation than antibodies.

**Catalytic Degradation**

- PPCA
- 35 x Aβ per second
- **Thousands of 4.2 kd peptides per 54 kDa**

**Stoichiometric Binding**

- Antibody
- **Two 4.2 kd peptides or oligomers per 180 kDa**
AAV-PPCA Shows Greater Plaque Reduction Using a More Aggressive AD Mouse Model Compared to Anti-Aβ42 mAbs

<table>
<thead>
<tr>
<th>Drug</th>
<th>Mouse model (mutations(^1))</th>
<th>Age of mouse at first dose</th>
<th>Treatment regimen and duration</th>
<th>Aβ42 plaque reduction data</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAV-PPCA (Ultragenyx)</td>
<td>5xFAD (Swedish, Florida, London, PSEN1M146L, PSEN1L286V)</td>
<td>3-4 months</td>
<td>Single dose / 3 months</td>
<td>&gt;60%+</td>
</tr>
<tr>
<td>Lecanemab (Eisai/Biogen)(^a)</td>
<td>ArcSwe, 2X FAD (Swedish, Arctic)</td>
<td>11-13 months</td>
<td>Weekly dose / 3 months</td>
<td>29%</td>
</tr>
<tr>
<td>Donanemab (Eli Lilly)(^b)</td>
<td>PDAPP (Indiana)</td>
<td>23-24 months</td>
<td>Weekly dose / 3 months</td>
<td>38%-53%</td>
</tr>
<tr>
<td>Aducanumab (Biogen)(^c)</td>
<td>Tg2576 (Swedish)</td>
<td>9 months</td>
<td>Weekly dose / 6 months</td>
<td>40%</td>
</tr>
</tbody>
</table>

(\(^1\)) List of mutations: Swedish - APPK670_M671delinsNL ; Florida - APPI716V ; London - APPv717I ; Arctic - APPE693G ; Indiana - APPv717F  
Pinnacle PCL™ and Ultragenyx GT Capabilities Enable Large Scale GT Production at Lower COGS to Treat Large Market CNS Indications

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**Pinnacle PCL™ platform**

Producer cell line technology with scalable process that provides reliable production of high quality AAV with improved yields

**Optimized CNS delivery**

Formulation and administration improvements greatly enhance CNS delivery and biodistribution

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Enables gene therapies for **large CNS indications**, such as Alzheimer’s disease
Summary on NewCo Amlogenyx and Next Steps

**Ultragenyx is spinning out a new company, Amlogenyx**
- Ultragenyx to retain majority ownership
- Ultragenyx to grant Amlogenyx license to required IP and know-how
- Amlogenyx to develop the novel therapeutic strategy using AAV delivery of a lysosomal protease

**Seeking independent funding and working to close a Series A round by year-end**

**Program will be cash neutral to Ultragenyx and will not alter our commitment to our key value drivers**
Closing Remarks
Well positioned to be the leader of rare disease medicine

Transformative treatment in our UX143 OI program

UX701 for Wilson disease demonstrated clinical activity in lowest dose cohort

GTX-102 for Angelman is changing lives

Pathway to profitability

We lead with purpose. Every moment matters.
## key clinical catalysts

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>OBJECTIVE</th>
<th>EXPECTED TIMING</th>
</tr>
</thead>
<tbody>
<tr>
<td>UX143</td>
<td>Osteogenesis Imperfecta</td>
<td>Ph 2 fracture data</td>
</tr>
<tr>
<td>GTX-102</td>
<td>Angelman Syndrome</td>
<td>Extension &amp; redosing data</td>
</tr>
<tr>
<td>UX701</td>
<td>Wilson Disease</td>
<td>Cohort 1 data</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cohorts 1-3 data</td>
</tr>
<tr>
<td>DTX401</td>
<td>GSDIa</td>
<td>Phase 3 unblinding</td>
</tr>
<tr>
<td>UX111</td>
<td>MPS IIIA</td>
<td>Regulatory discussions on filing</td>
</tr>
</tbody>
</table>
Q&A
Thank You