XENON

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CORPORATE OVERVIEW

January 2021

NASDAQ: XENE | www.xenon-pharma.com

Forward Looking Statement/Safe Harbor

This presentation and the accompanying oral commentary contain forward-looking statements that involve risks, uncertainties and assumptions. If the risks or uncertainties ever materialize or the assumptions prove incorrect, our results may differ materially from those expressed or implied by such forward-looking statements. All statements other than statements of historical fact could be deemed forward-looking, including, but not limited to, statements regarding the anticipated impact and timing of the COVID-19 pandemic on our business, research and clinical development plans and timelines and results of operations; the timing of and results from clinical trials and pre-clinical development activities, including those related to XEN496, XEN1101, XEN007, and other proprietary products, and those related to NBI-921352, FX301, and other partnered product candidates; the potential efficacy, safety profile, future development plans, addressable market, regulatory success and commercial potential of XEN496, XEN1101, XEN007 and other proprietary and partnered product candidates; the anticipated timing of IND, or IND-equivalent, submissions and the initiation of future clinical trials for XEN496, XEN1101, XEN007, and other proprietary products, and those related to NBI-921352, FX301, and other partnered candidates; the efficacy of our clinical trial designs; our ability to successfully develop and achieve milestones in the XEN496, XEN1101, XEN007 and other proprietary development programs; the timing and results of our interactions with regulators; the potential to advance certain of our product candidates directly into Phase 2 or later stage clinical trials; anticipated enrollment in our clinical trials and the timing thereof; the expansion of the X-TOLE clinical trial and the anticipated timing of the topline data therefrom; the progress and potential of our other ongoing development programs; the potential receipt of milestone payments and royalties from our collaborators; our expectation of having sufficient cash to fund operations into 2023; and the timing of potential publication or presentation of future clinical data.

These statements are based on estimates and information available to us at the time of this presentation and are not guarantees of future performance. Actual results could differ materially from our current expectations as a result of many factors, including but not limited to: the impact of the COVID-19 pandemic on our business, research and clinical development plans and timelines and results of operations, including impact on our clinical trial sites, collaborators, and contractors who act for or on our behalf, may be more severe and more prolonged than currently anticipated; clinical trials may not demonstrate safety and efficacy of any of our or our collaborators' product candidates; our assumptions regarding our planned expenditures and sufficiency of our cash to fund operations may be incorrect; our ongoing discovery and pre-clinical efforts may not yield additional product candidates; any of our or our collaborators' product candidates may fail in development, may not receive required regulatory approvals, or may be delayed to a point where they are not commercially viable; we may not achieve additional milestones in our proprietary or partnered programs; regulatory agencies may impose additional requirements or delay the initiation of clinical trials; regulatory agencies may be delayed in reviewing, commenting on or approving any of our or our collaborators' clinical development plans as a result of the COVID-19 pandemic, which could further delay development timelines; the impact of competition; the impact of expanded product development and clinical activities on operating expenses; impact of new or changing laws and regulations; adverse conditions in the general domestic and global economic markets; as well as the other risks identified in our filings with the Securities and Exchange Commission and the securities commissions in British Columbia, Alberta and Ontario. Except as required by law, we assume no obligation and do not intend to update these forward-looking statements or to conform these statements to actual results or to changes in our expectations.

NOTE: Comparisons of XEN1101 and ezogabine are based on results in published literature, not based on data resulting from head-to-head trials, and are not direct comparisons of safety or efficacy. Different protocol designs, trial designs, patient selection and populations, number of patients, trial endpoints, trial objectives and other parameters that are not the same between the relevant trials may cause any comparisons of results from different trials to be unreliable.

Xenon Overview

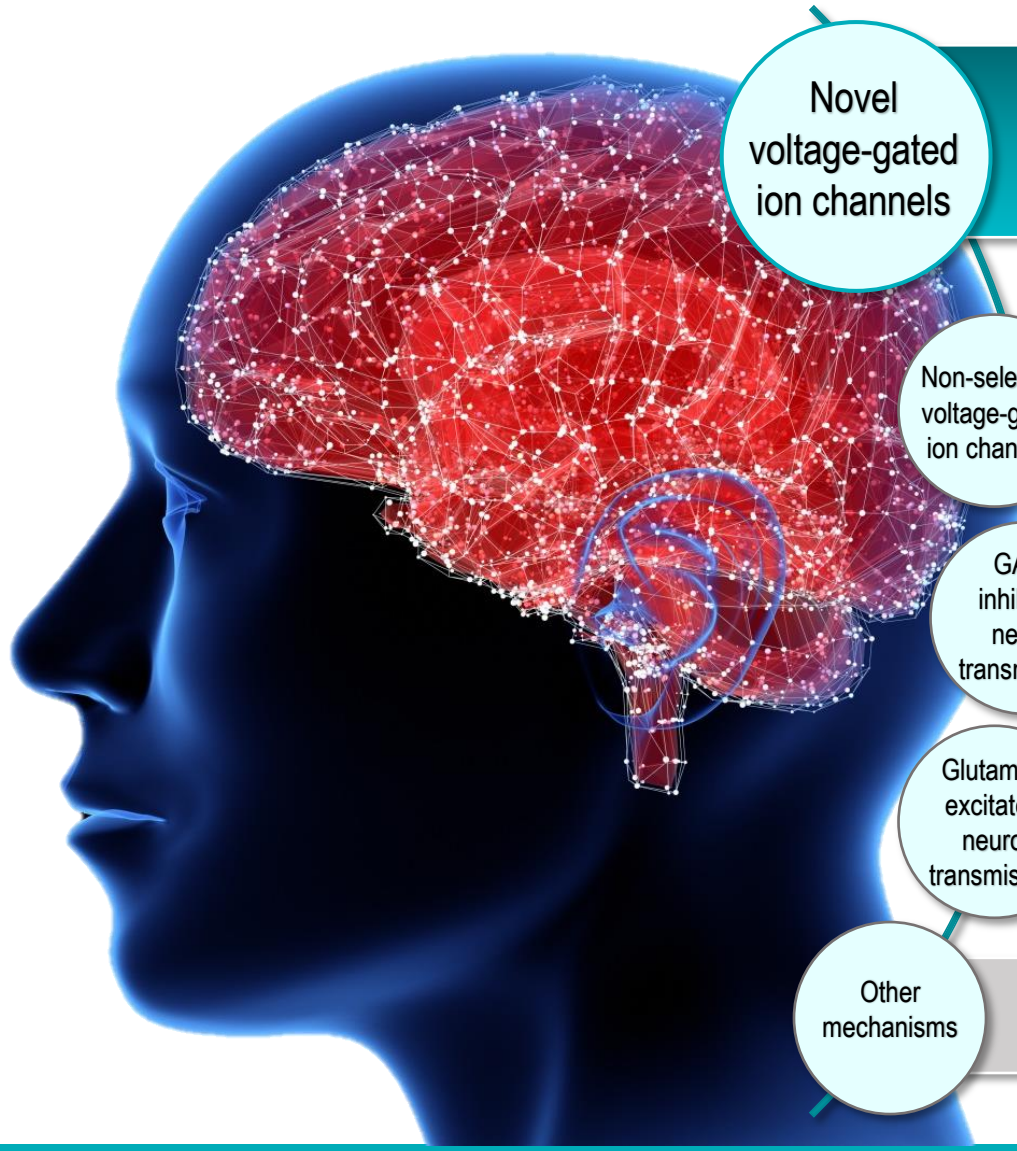
- Small molecule, ion channel neurology-focused biopharma company (NASDAQ: XENE)
- Mid-to-late stage clinical trials and important clinical data anticipated in 2021
- Strong partnerships with collaborators
- Solid financial position
  - $190.9M in cash, cash equivalents and marketable securities as of September 30, 2020
  - Anticipate cash runway into 2023, excluding any revenue generated from existing partnerships or potential new partnering arrangements

Ion Channel, Neurology-Focused Pipeline

Therapeutic Program *Indication*	Pre-clinical	Phase 1	Phase 2	Phase 3
XEN496 (Potassium Channel Modulator) *Orphan Pediatric Epilepsy*				
XEN1101 (Potassium Channel Modulator) *Adult Focal Epilepsy*				
XEN007* (Calcium Channel Inhibitor) *Childhood Absence Epilepsy*				
Ion Channel Modulators *Orphan Channelopathies*				
NBI-921352 (XEN901) and $Na_V1.6/1.2$ Sodium Channel Inhibitors *Epilepsy (Orphan Pediatric and Adult Focal)* — Neurocrine Biosciences				
FX301 *Post-operative Pain* — flexion				
$Na_V1.7$ Inhibitors *Pain* — Genentech, A Member of the Roche Group				

*A physician-led, Phase 2 proof-of-concept study is ongoing to examine XEN007 as an adjunctive treatment in pediatric patients diagnosed with treatment-resistant childhood absence epilepsy (CAE).

Novel, Proprietary K_V7 Channel Modulators



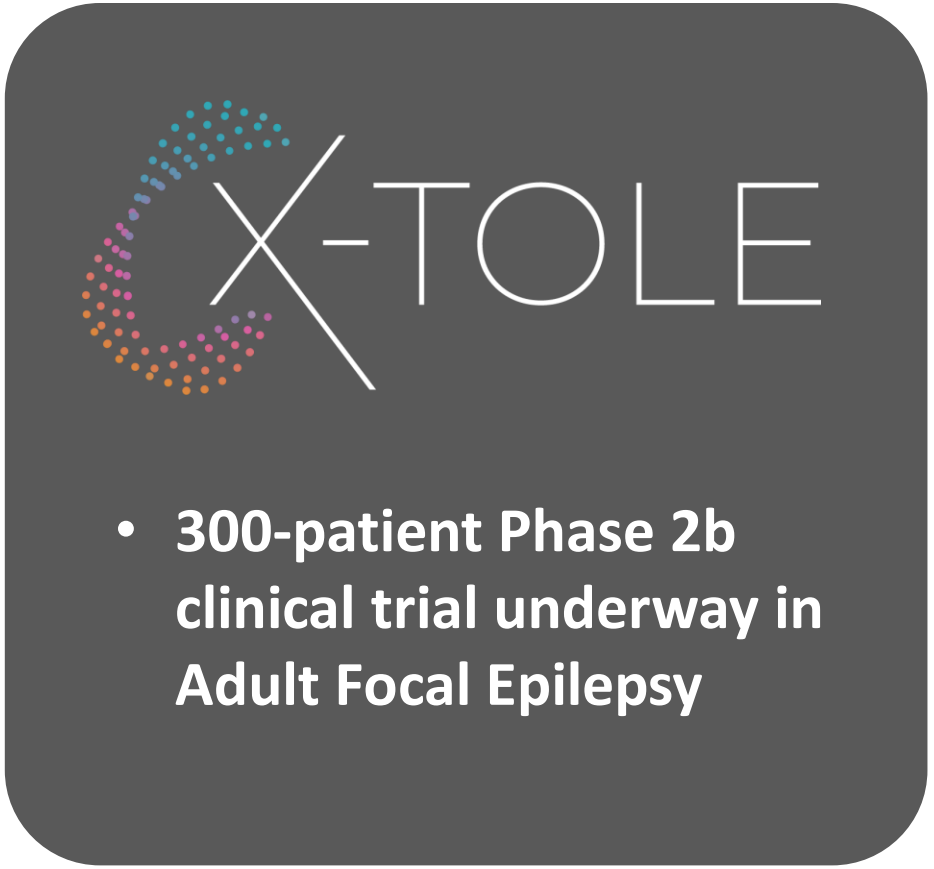
XEN1101 (K_V7) | XEN496 (K_V7)

Major Classes Of Approved Anti-Seizure Medications (ASMs)

Non-selective voltage-gated ion channels	Phenytoin (Na+); Carbamazepine (Na+); Pregabalin (Ca^{2}+); Lacosamide (Na+)
GABA inhibitory neuro-transmission	Clobazam; Diazepam; Vigabatrin; Tiagabine
Glutamate excitatory neuro-transmission	Topiramate (KA); Perampanel (AMPA)
Other mechanisms	Levetiracetam; Brivaracetam; Cannabidiol (CBD), Cenobamate

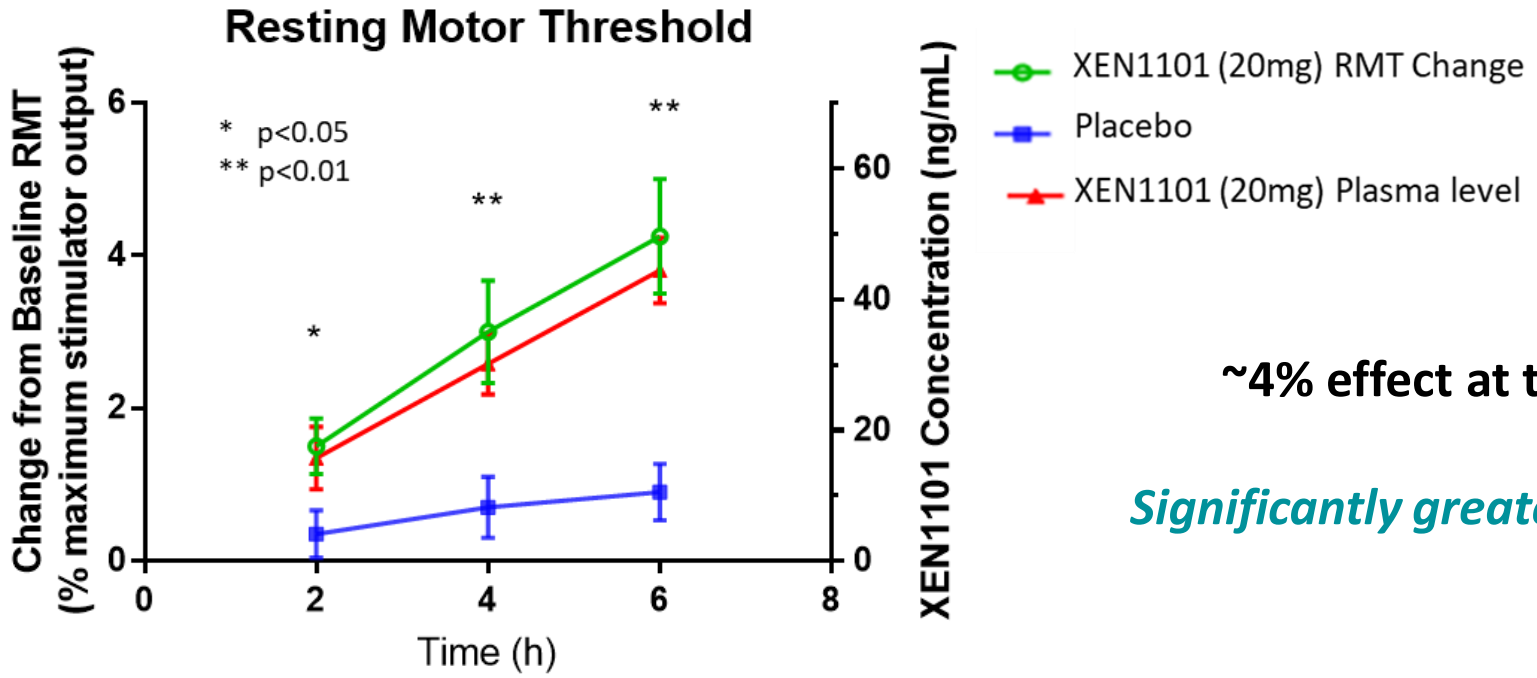
XEN1101: Potential "Next-Gen" K_V7 Potassium Channel Modulator

- Same proven MOA in adult focal seizures as ezogabine, but with potential improvements:
  - More potent *in vitro* and *in vivo*
  - 3- to 4-fold selective for KCNQ2/3 over other KCNQ channels
  - No need for titration
  - Once daily dosing with evening administration
  - No pigmented dimers and no predicted discoloration liability
- Phase 1 studies completed
  - PK supporting once-daily dosing
  - Mild, transient AE profile consistent with MOA (e.g. dizziness, sedation, blurred vision)
  - No safety signals in ECG or Safety Labs; no SAEs
- Robust TMS signal in Phase 1b study



Summary of XEN1101 Phase 1b TMS Results

- TMS was used to evaluate the corticospinal and cortical activity profile of XEN1101 compared to placebo in healthy male volunteers
  - Significant plasma concentration dependent reduction of corticospinal (RMT) and cortical (TEP) excitability

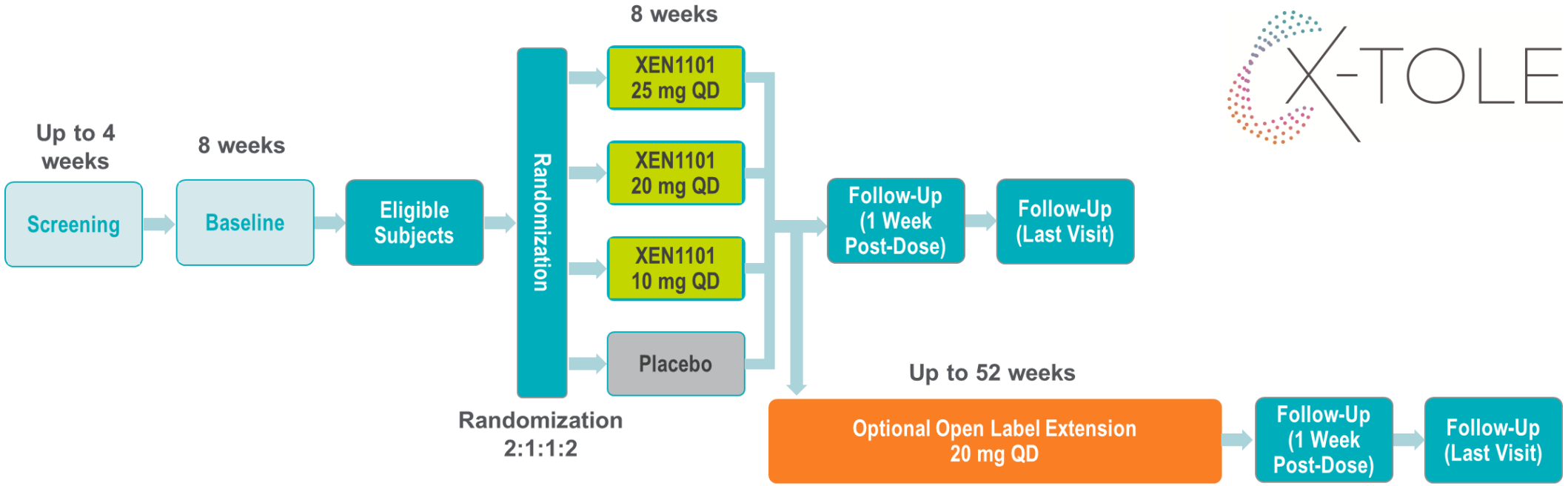


~4% effect at t=6 hours vs placebo

Significantly greater effect than ezogabine

XEN1101 Phase 2b Clinical Trial Underway

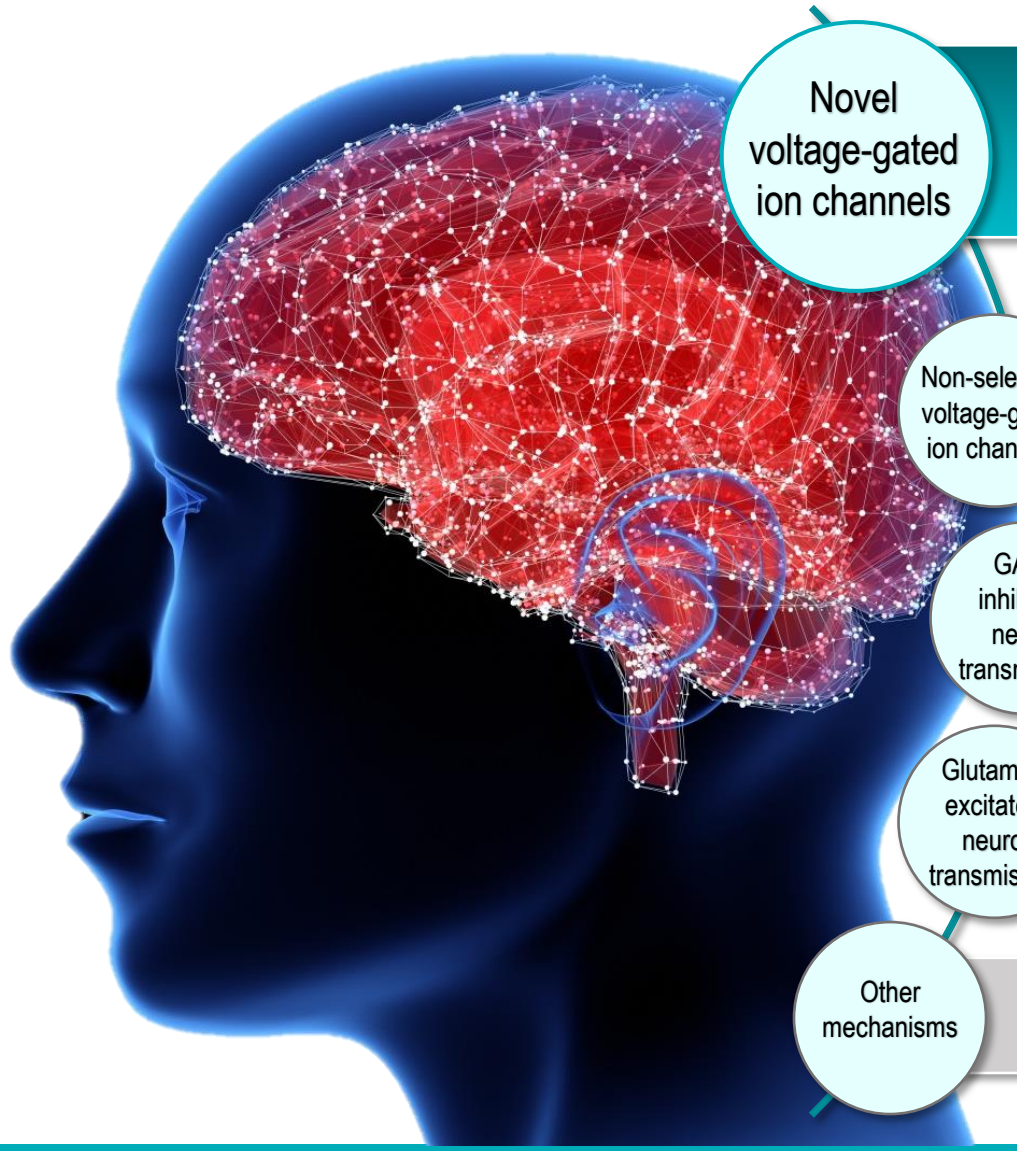
- Phase 2b “X-TOLE” clinical trial underway in ~300 adult patients with focal epilepsy
  - **Primary endpoint**:
    Median % change in monthly focal seizure frequency from baseline compared to treatment period of active vs. placebo



- Expect patient randomization completed by 1H:2021 and topline data in Q3:2021*

*Guidance is dependent upon feedback from the clinical sites and patient enrollment rates given the ongoing COVID-19 pandemic.

Novel, Proprietary K_V7 Channel Modulators



XEN1101 (K_V7) | XEN496 (K_V7)

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XEN496 Overview: Phase 3 Trial Initiated

- XEN496, active ingredient ezogabine (retigabine)
- Only anti-seizure medication previously approved by FDA with MOA that potentiates K_V7-mediated potassium current
- Proven mechanism in adult focal seizures
- Potential for precision medicine approach to treat KCNQ2-DEE pediatric epilepsy
- Phase 3 trial initiated with novel pediatric-friendly formulation

Precision Medicine Approach in Pediatric KCNQ2-DEE Patients

About KCNQ2-DEE

- Severe neurodevelopmental disorder caused by dominant negative missense mutations in the KCNQ2 that presents during first week of life
- Recent epidemiology study from Europe reported KCNQ2 birth rate of ~1 in 17,000[1]

[1]Symonds et al. *Brain*, August 2019.

Case Studies Suggest XEN496 is Active in this Often Refractory Disease

Case Study of 11 KCNQ2-DEE Patients *Millichap 2016*	**Medical Record Review/Parent Interviews** *Olson 2017* (8 Families)
Ezogabine use (assessed by the treating physicians and parents) was associated with : • improvement in seizures and/or development in 3 of the 4 patients treated before 6 months of age, and 2 of the 7 patients treated later • 3 of the 4 infants treated before 6 months old were seizure free or occasional seizures <1/week • No serious side effects were observed	Interviews/medical record review of KCNQ2-DEE patients prescribed ezogabine: • Sustained improvement in seizure frequency in 5 of the 6 children with at least weekly seizures • Improvements in development or cognition in all 8 children • Urinary retention/hesitation in 3 patients, but overall well tolerated

"Our hope is that XEN496 could represent a genetically targeted treatment that improves the lives of children living with this debilitating disease."

Jim Johnson, President, KCNQ2 Cure Alliance

New, Proprietary, Pediatric-Friendly Formulation of XEN496

XEN496 is a pediatric-friendly granule formulation with novel IP, packaged as single-dose sprinkle capsules

- PK study in 24 adult healthy volunteers is complete
- Phase 3 clinical trial initiated
  ~40 KCNQ2-DEE patients (one-month up to six years old)
- Randomized, double-blind, placebo-controlled, parallel group, multicenter study
  - **Primary endpoint:** percent change from baseline in monthly countable motor seizure frequency during the blinded treatment period, as recorded by caregivers in a daily seizure diary

XEN496 Granules

Typical sprinkle capsule

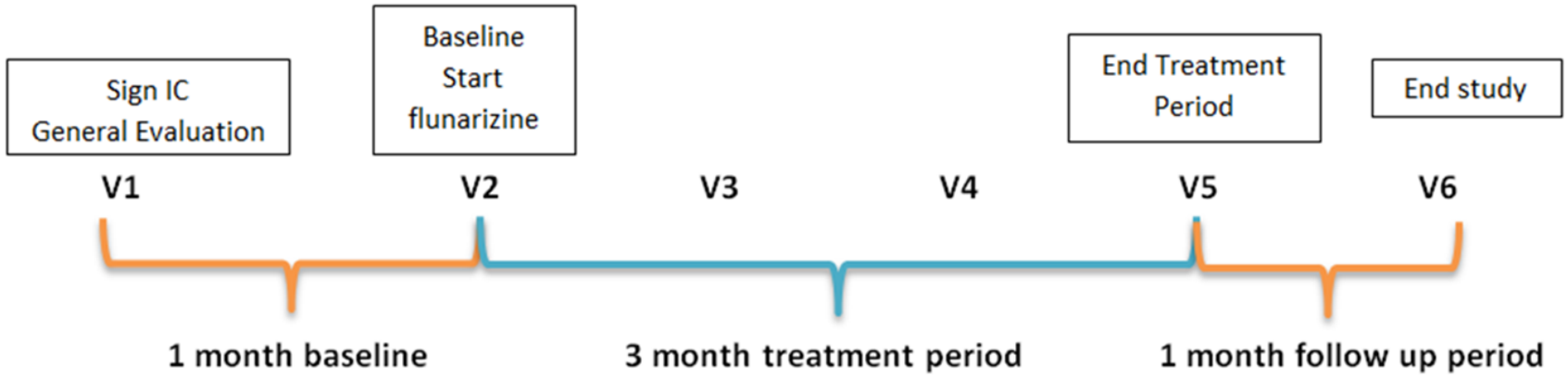
Support for XEN496 Development:

- ✓ GSK provided right of reference to FDA
- ✓ *Orphan Drug Designation* and *Fast Track* designation in U.S. and *Orphan Medicinal Product* designation in Europe
- ✓ Steering committee of KCNQ2-DEE experts
- ✓ Letters of support sent to FDA from KOLs, patients, and advocacy groups
- ✓ Principal Investigator for study: Dr. John Millichap
- ✓ Improving access to diagnosis through the Behind the Seizures™ program and other partnerships
- ✓ Patient/caregiver surveys to inform trial design and endpoints

*Guidance is dependent upon the ability to initiate clinical sites and patient enrollment given the ongoing COVID-19 pandemic.

XEN007: Childhood Absence Epilepsy (CAE) Phase 2 Study

- Ongoing physician-led, open label study using XEN007 (flunarizine) as add-on therapy in ~20 children with treatment resistant absence epilepsy (failed 2 or more ASMs)
- Preliminary data from 3 CAE patients presented at AES in Dec. 2020
  - > 50% reduction in diary recorded seizures in all 3 CAE patients, with 2 showing >80% reduction
  - EEGs for the three CAE subjects showed resolution of absences for 2 subjects and 94% reduction for one



Primary outcome measure (seizure diaries): percent reduction in absence seizure frequency for the final 30 days of treatment compared to 30-day baseline

Additional endpoints: Clinical EEGs during visits

- Topline results from larger data set expected mid-2021

Selective $Na_V1.6$ Inhibitor for Rare Pediatric Epilepsy (NBI-921352)

NBI-921352 (formerly XEN901)

- Neurocrine has exclusive license to XEN901 (now called NBI-921352) and other pre-clinical, selective $Na_V1.6$ inhibitors and dual $Na_V1.2/1.6$ inhibitors for development
- Potent and selective inhibitor to precisely target the sodium channel affected by the genetic mutation of *SCN8A* – $Na_V1.6$
- Initiation of Phase 2 study with NBI-921352 anticipated in 2021
  - Upon FDA acceptance of an IND in either SCN8A-DEE or a major indication, Xenon is eligible to receive a milestone payment of either $25 million or $10 million, respectively (cash + equity investment)

About SCN8A-DEE

- Rare form of early-onset epilepsy with occurrence of **seizures** beginning in the first 18 months of life
- **Physical and psychological symptoms** include recurrent seizures of all types, developmental delays, learning difficulties, muscle spasms, poor coordination, sleep problems, and autistic-like features
- **No approved treatments**

$Na_V1.7$ Inhibitor for Post-Operative Pain (FX301)

FX301 (formerly XEN402)

- Flexion Therapeutics, Inc. acquired global rights to develop and commercialize XEN402, a $Na_V1.7$ inhibitor, also known as funapide
- FX301 consists of XEN402 formulated for extended release from a thermosensitive hydrogel intended to support administration as a peripheral nerve block for control of post-operative pain
- Flexion anticipates filing an IND in 1H:2021 to support a clinical trial of FX301 in patients undergoing bunionectomy

Supportive FX301 Pre-Clinical Data

- New pre-clinical FX301 data presented on the American Society of Regional Anesthesia and Acute Pain website:
  - FX301 provided sustained, post-operative analgesic effect with no impairment in motor function compared to liposomal bupivacaine and placebo
  - High local concentrations of funapide were measured at the site of administration for the duration of the study, which is consistent with the creation of a depot providing controlled drug release

Multiple Catalysts & Value-Creating Milestone Opportunities

XEN1101

- Phase 2b clinical trial (X-TOLE study) in adult focal seizures ongoing in Canada, U.S. and Europe
- Patient randomization to be completed in 1H:2021; topline results anticipated in Q3:2021*
- Evaluating additional potential indications for XEN1101 development

XEN496

- Adult PK study completed with pediatric XEN496 formulation of ezogabine
- Phase 3 clinical trial in pediatric KCNQ2-DEE initiated

XEN007

- Physician-led Phase 2 open label study in CAE; topline results expected in mid-2021*

Partnered Programs

NBI-921352 (XEN901) / Neurocrine Biosciences

- Neurocrine anticipates initiation of a clinical trial in 2021, triggering cash + equity investment milestone payment upon FDA acceptance of IND

FX301 / Flexion Therapeutics

- FX301 ($Na_V1.7$ inhibitor for post-operative pain) expected to enter a clinical trial in 2021

*Guidance given is dependent upon patient enrollment rates and/or the ability to initiate clinical sites given the ongoing COVID-19 pandemic.

For more information:

investors@xenon-pharma.com