

July 10, 2024



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# Avexitide: Novel GLP-1 Receptor Antagonist for the Potential Treatment of Hyperinsulinemic Hypoglycemia

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# Avexitide is a Compelling Asset with FDA Breakthrough Therapy Designation

Novel, first-in-class GLP-1 receptor antagonist with the potential to treat hyperinsulinemic hypoglycemia



Sizable and debilitating orphan indications with no approved treatment options



Clear match of mechanism of disease (hyperinsulinemic hypoglycemia) and mechanism of potential treatment



Highly statistically significant and clinically meaningful data with well-tolerated safety profile replicated across five clinical trials of PBH



Builds on Amylyx' endocrine and neuroscience expertise



Rapid path to Phase 3 based on outcomes met in Phase 2 and Phase 2b; Plan to utilize FDA-agreed upon primary endpoint in Phase 3

**Data from pivotal post-bariatric hypoglycemia (PBH) Phase 3 program expected in 2026, planning for commercial launch in 2027**

# Bariatric Surgery is a Cornerstone of Weight Loss Therapy

With millions of people having undergone surgery

~2M

people living in the U.S. have received bariatric surgery in the past 10 years<sup>1</sup>



>200K

new procedures are happening annually<sup>1</sup>

## Bariatric Surgery Results in Substantial Weight Loss

- 20-30% reduction in bodyweight, with some participants losing even more<sup>2,3</sup>
  - Higher BMI associated with higher total weight loss<sup>4</sup>
- Bariatric surgery shows benefits for other conditions including in direct comparison to medical management for **Type 2 diabetes<sup>5</sup>** and **cardiovascular disease<sup>6,7</sup>**

# Millions of People Have Already Benefited From Bariatric Surgery

Expected to remain a cornerstone of weight loss therapy despite the introduction of GLP-1 receptor agonists for weight loss



Bariatric surgery is likely more effective and more sustainable for weight loss<sup>1,6</sup> and evidence suggest reduced risk of cardiovascular events and MASLD (previously known as NAFLD)<sup>2,3</sup>



Bariatric surgery is cost-effective and covered by insurance<sup>4</sup>



Bariatric surgery and GLP-1 agonists may be combined, especially for people with higher BMIs<sup>5</sup>

There are already millions of people who have undergone bariatric surgery

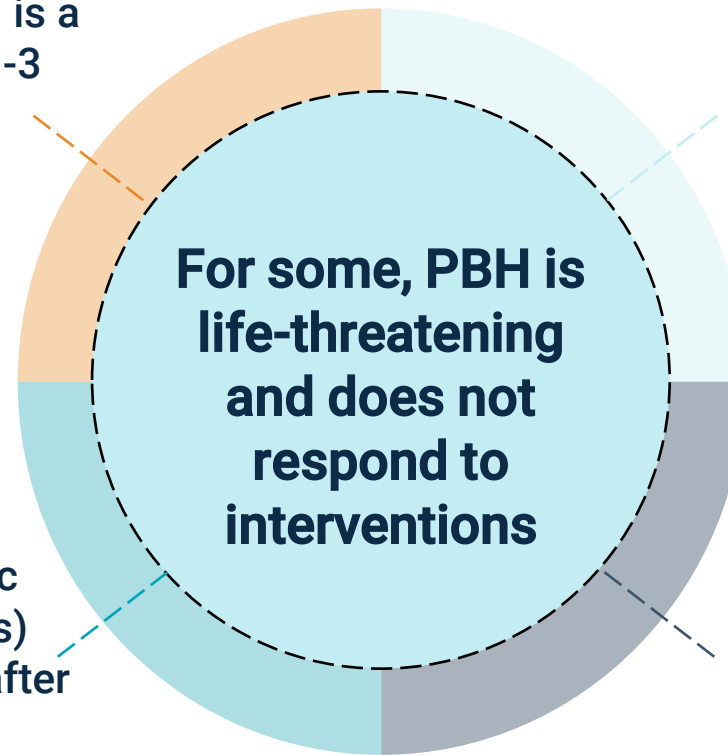
MASLD = metabolic dysfunction-associated steatotic fatty liver disease  
NAFLD = nonalcoholic fatty liver disease



1. Sarma, S. et al. *Obesity (Silver Spring)*. 2022;30(11):2111-2121. doi:10.1002/oby.23563 2. Cohen, E. et al. *The American Journal of Gastroenterology*. 2023;118(10S):p S1237. doi: 10.14309/01.ajg.0000956248.42228.0d 3. Adekolu, A. et al. *The American Journal of Gastroenterology*. 2023;118(10S):p S971. doi: 10.14309/01.ajg.0000954768.41220.8b4. 4. Haseeb, M. et al. *JAMA Netw Open*. 2024;7(4):e246221. doi:10.1001/jamanetworkopen.2024.6221 5. Weight-loss drugs are increasingly paired with bariatric surgery, 2023. *Axios*. 6. Jenkins, M. et al. (2024, June 9-13). *Effectiveness and durability of common weight loss methods* [Poster]. ASBMS Annual Meeting, San Diego, CA, United States. [Link to access](#).

# Post-Bariatric Hypoglycemia is a Condition Affecting People Who Have Undergone Bariatric Surgery

- Post-bariatric hypoglycemia (PBH) is a condition that occurs on average 1-3 years post bariatric surgery<sup>1</sup>



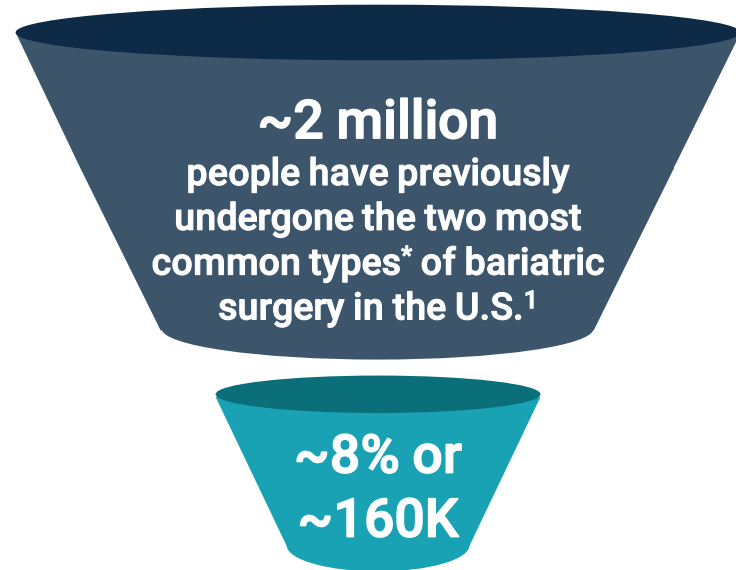
- Characterized by hyperinsulinemic (inappropriately high insulin levels) hypoglycemia (low blood sugar) after a meal (postprandial)<sup>2</sup>

- Symptomatic PBH can have disabling effects
  - > Autonomic and neuroglycopenic symptoms, such as impaired cognition, loss of consciousness, and seizures<sup>3</sup>
  - > Can lead to falls, motor vehicle accidents, and job and income loss<sup>3</sup>

- Current management approaches are insufficient
  - > Symptoms persist for many despite dietary modification and off-label use of acarbose, octreotide, and/or diazoxide<sup>4</sup>
  - > Patient typically managed by endocrinologist/diabetologist

# Impact of PBH

## Prevalence



Estimated that **~8%** of people undergoing bariatric surgery will develop *symptomatic* PBH<sup>2,3</sup>

It is estimated that **~160,000** people are currently living with *symptomatic* PBH in the U.S.<sup>1-3</sup>

### Characteristics of symptomatic PBH from literature:<sup>2-4</sup>

- Measured glucose value of <54 mg/dL (3.0 mmol/L) after bariatric surgery
- Postprandial neuroglycopenic symptoms: difficulty speaking, blurred vision, confusion, drowsiness, impaired consciousness, coma, seizures, traffic accidents, requiring ER visit or hospitalization

\*According to 2022 bariatric surgery estimates from the American Society for Metabolic and Bariatric Surgery (ASMBS), more than 75% of bariatric surgeries in the U.S. are either sleeve gastrectomy (57%) or Roux-en-Y gastric bypass (22%).<sup>1</sup>

## Living with PBH

“PBH has affected me physically and mentally.”

“I pass out multiple times a week. My lows are averaging 4-5 times a day.”

“It affected my ability to work and take care of my family.”

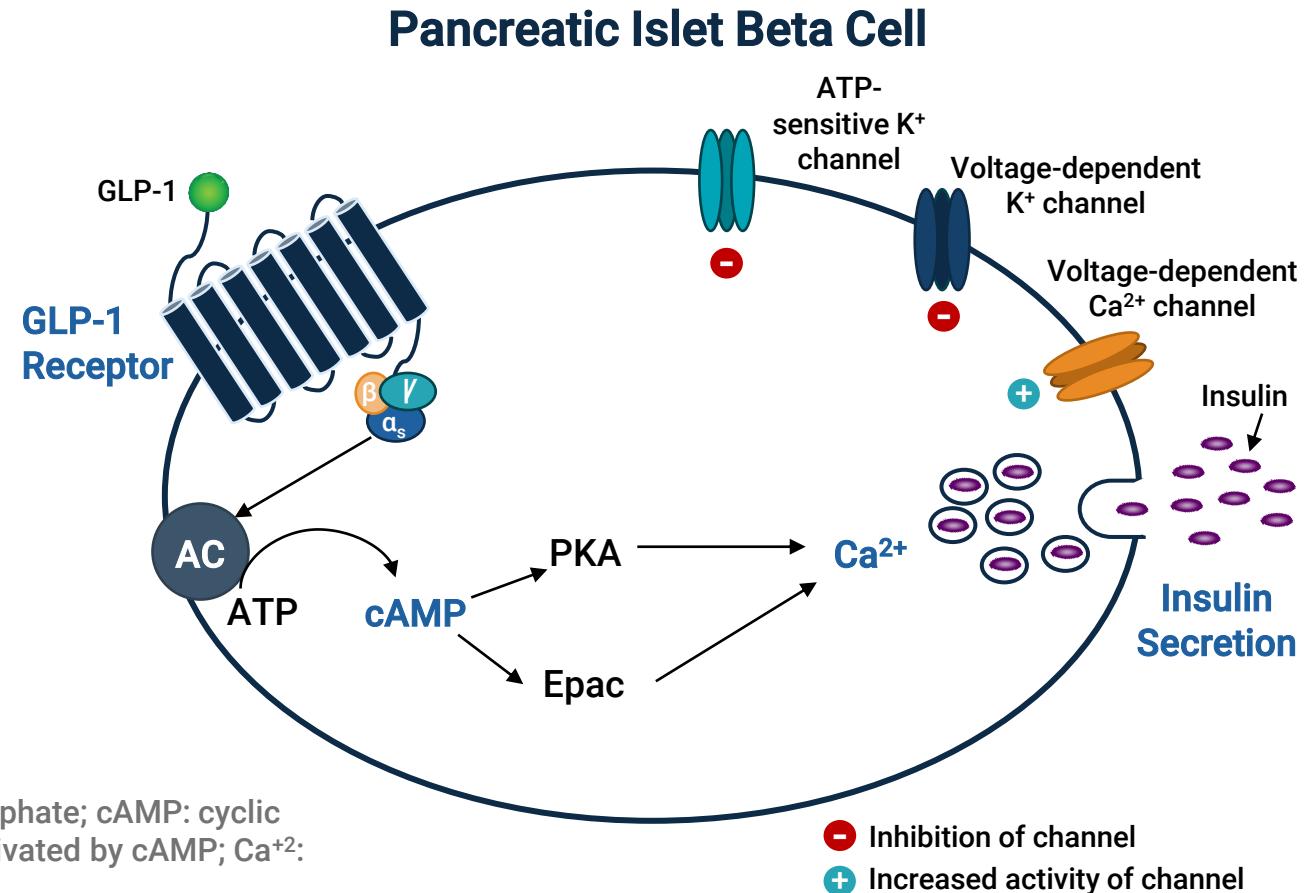
“I lost my driver’s license since I am unaware of my lows.”

# GLP-1 Receptor Pathway Mediates Blood Glucose Levels via Insulin Secretion

Production of cAMP initiates pathways leading to insulin secretion

## GLP-1 Receptor Mediated Insulin Secretion<sup>1,2</sup>

- GLP-1 receptor couples to trimeric G-protein complex, activating adenylyl cyclase (AC)
- Increased production of cAMP
- Activation of PKA and Epac
  - > Inhibition of ATP-sensitive and voltage-dependent potassium channels
  - > Increased activity of voltage-dependent calcium channels
- Increased Ca<sup>2+</sup> influx
- Insulin secretion



GLP-1: glucagon-like peptide-1; AC: adenylate cyclase; ATP: adenosine triphosphate; cAMP: cyclic adenosine monophosphate; PKA, protein kinase A; Epac: exchange protein activated by cAMP; Ca<sup>2+</sup>: calcium; K<sup>+</sup>: potassium.

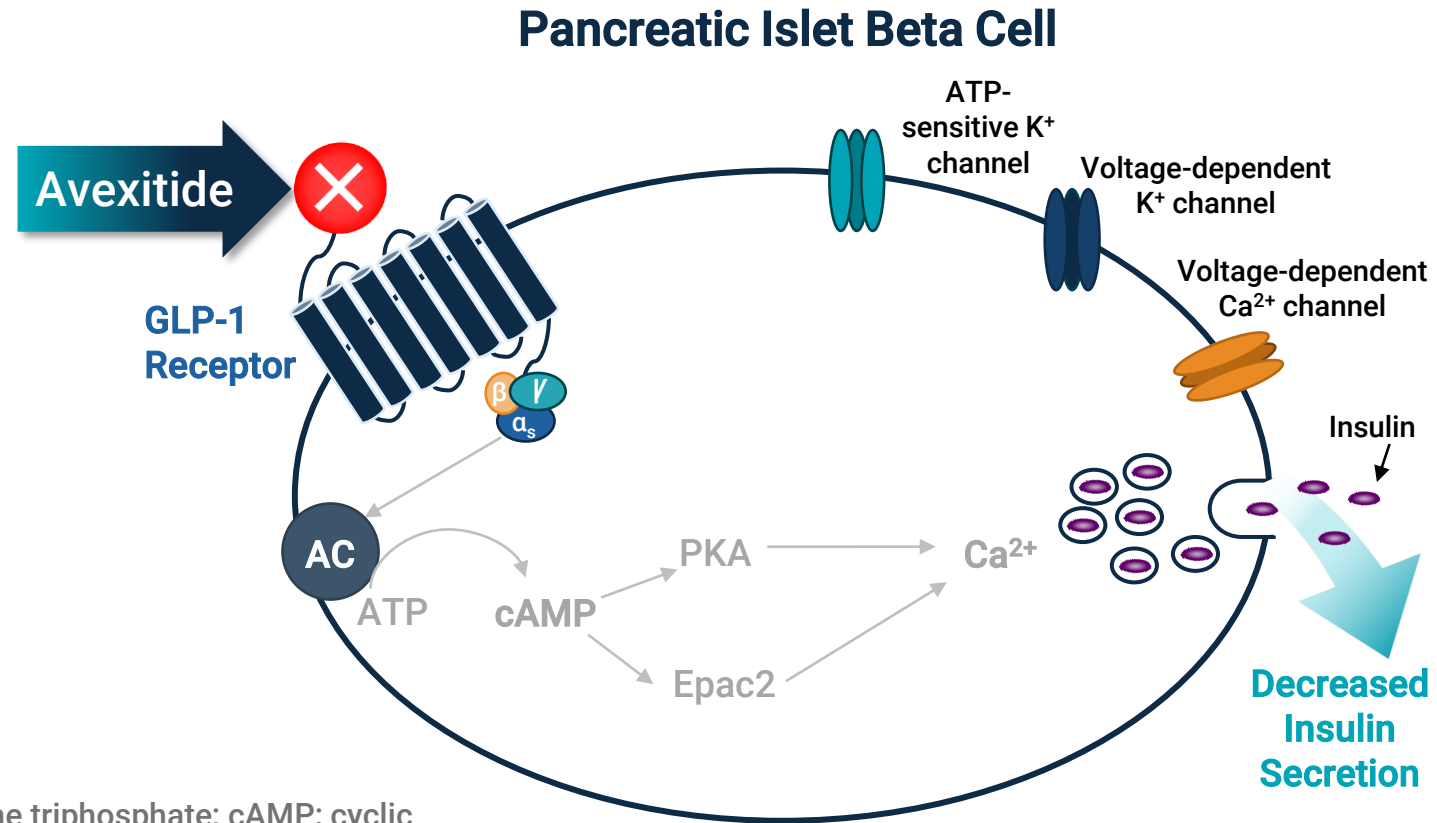


# Avexitide: An Investigational GLP-1 Receptor Antagonist

Demonstrated to bind to GLP-1 receptor, decrease insulin secretion, stabilize glucose level

## Proposed Mechanism of Action of Avexitide<sup>1-4</sup>

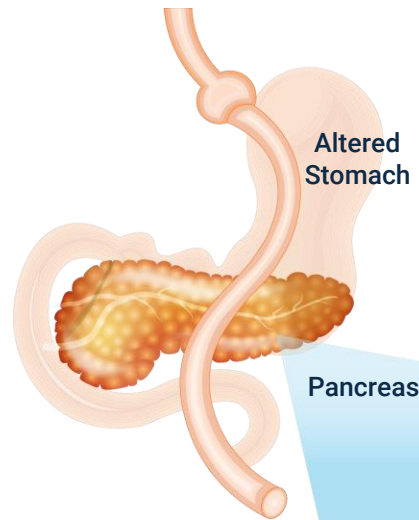
- Binds to GLP-1 receptor (antagonist)
- Lowers cAMP levels
- Decreases insulin secretion
- Stabilizes glucose levels



GLP-1: glucagon-like peptide-1; AC: adenylate cyclase; ATP: adenosine triphosphate; cAMP: cyclic adenosine monophosphate; PKA, protein kinase A; Epac: exchange protein activated by cAMP; Ca<sup>2+</sup>: calcium; K<sup>+</sup>: potassium.

# PBH is Believed to be Caused by an Excessive Postprandial GLP-1 Response

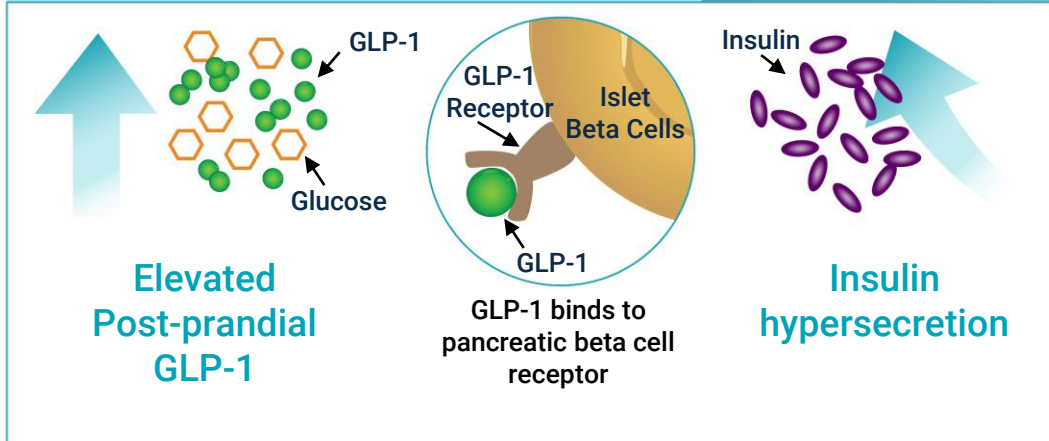
Elevated GLP-1 secretion leads to insulin hypersecretion and subsequent hypoglycemia with potentially severe symptoms and consequences<sup>1-7</sup>



## Changes Post-Bariatric Surgery<sup>1-3</sup>

- Rapid gastric pouch emptying
- Increased delivery of nutrients to GLP-1 secreting intestinal L cells

Pancreas



## Post-bariatric Hypoglycemia (PBH)<sup>1,4-8</sup>

### Symptomatic Hypoglycemia

#### Autonomic Symptoms

- Sweating
- Shaking
- Palpitations
- Anxiety

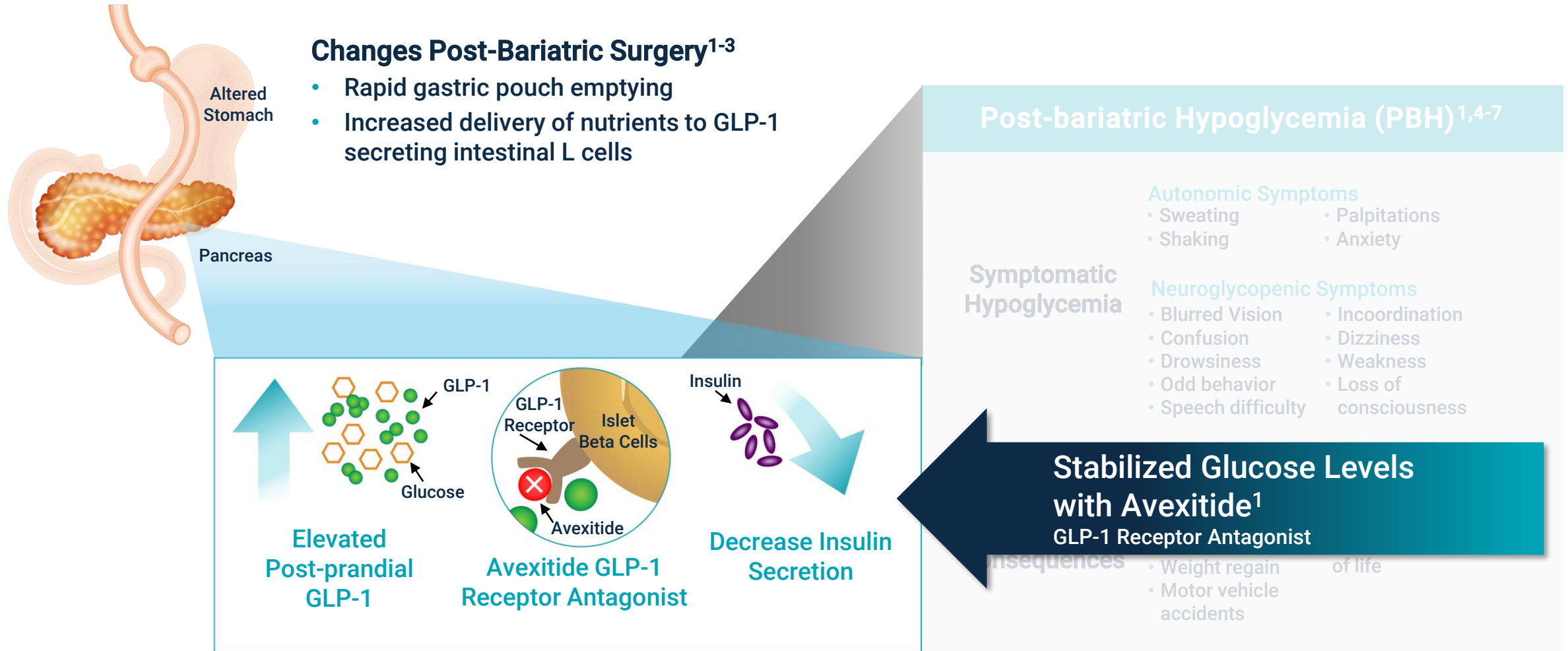
#### Neuroglycopenic Symptoms

- Blurred Vision
- Confusion
- Drowsiness
- Odd behavior
- Speech difficulty
- Incoordination
- Dizziness
- Weakness
- Loss of consciousness
- Impaired cognition

### Potential Consequences

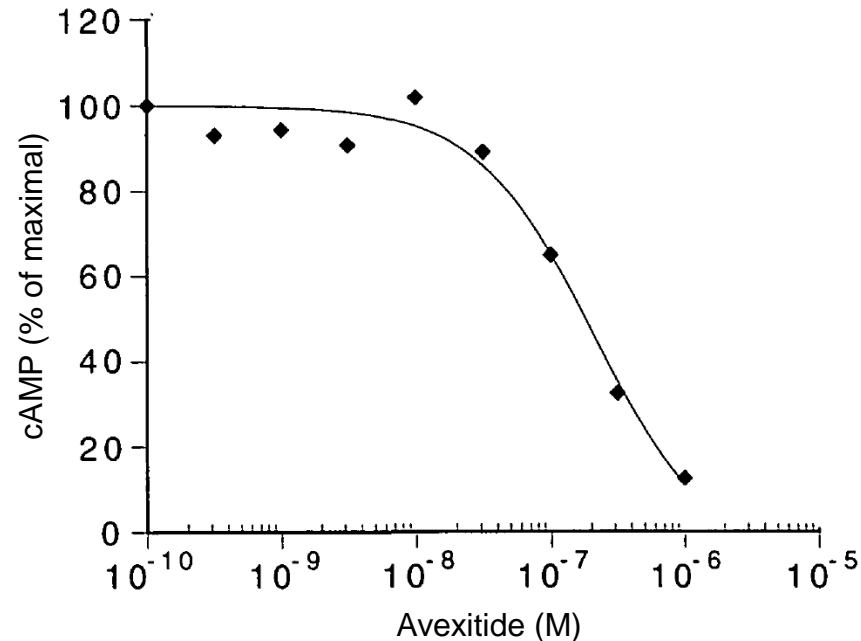
- Hypoglycemia unawareness
- Seizures
- Weight regain
- Motor vehicle accidents
- Cardiac arrhythmias
- Missed work
- Decreased quality of life
- Falls

# Mechanism of Action: Avexitide Proposed to Decrease Insulin Secretion and Stabilize Glucose Levels via GLP-1 Receptor Blockade

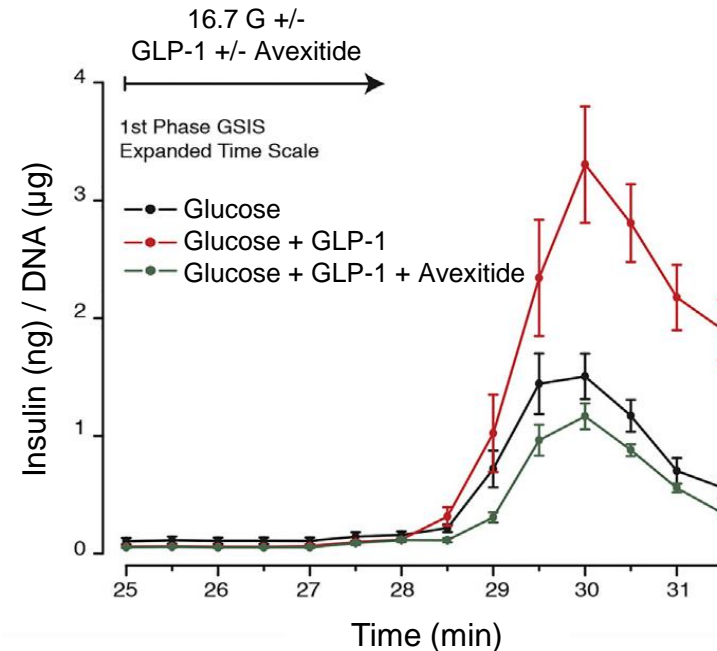


# GLP-1 Receptor Antagonism Lowers cAMP and Insulin Secretion

Dose-dependent antagonism of avexitide in one of the classic GLP-1 agonist cellular assays, wherein blocking the GLP-1 receptor causes a decrease in cyclic AMP (cAMP) in hamster fibroblast cells<sup>1</sup>

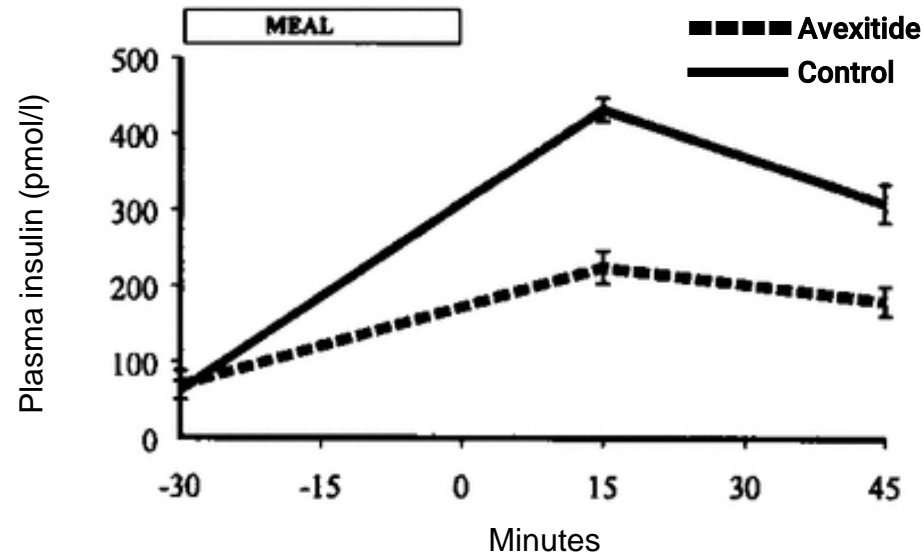


GLP-1 receptor antagonism blocks GLP-1 and decreases insulin response to glucose in rat pancreatic islet cells<sup>2</sup>



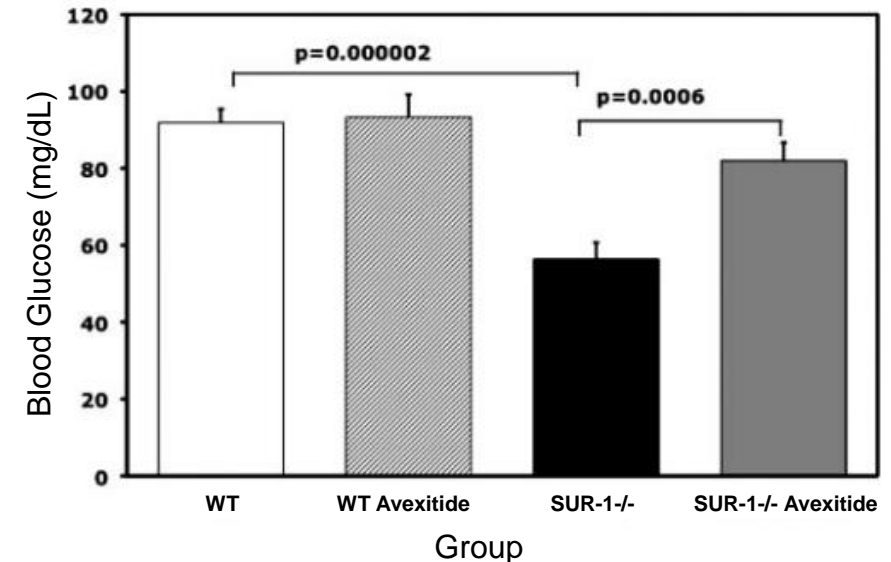
# By Inhibiting GLP-1 Activity, Avexitide Decreases Plasma Insulin and Mitigates Hypoglycemia In Vivo Preclinical Models

Avexitide decreased plasma insulin in relevant model<sup>1</sup>



Insulin and glucose concentrations after a meal in conscious trained rats. All rats were injected with pre-meal subcutaneous saline for 10 d beforehand. On the day of the experiment avexitide treated animals (*dotted line*) were given pre-meal subcutaneous avexitide (4.5 nmol/kg) and control animals (*solid line*) received premeal subcutaneous saline. Glucose concentrations were significantly higher ( $P < 0.001$ ) and insulin concentration were reduced in the avexitide treated animals ( $P < 0.001$  at 15 min and  $P < 0.01$  at 45 min).<sup>1</sup>

Avexitide stabilized blood glucose levels in genetic hypoglycemia model<sup>2</sup>



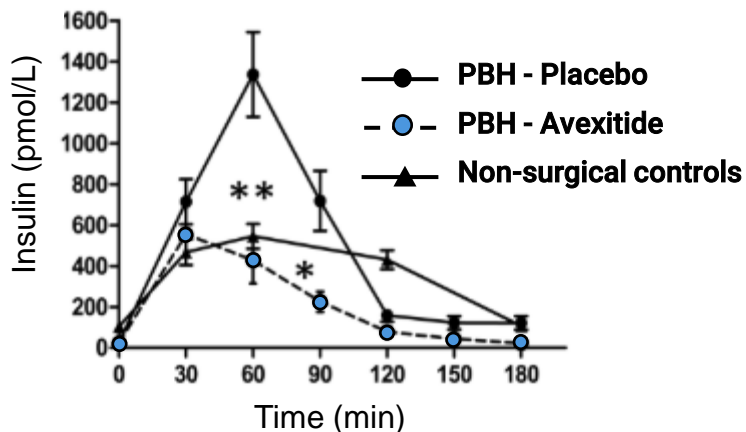
Avexitide stabilized fasting blood glucose levels in SUR-1<sup>-/-</sup> mice. Blood glucose levels were determined after a 12–16-h fast on day 7. *White bar*, vehicle-treated wild-type littermates ( $n=13$ ); *hatched bar*, avexitide-treated wild-type littermates ( $n=10$ ); *black bar*, vehicle-treated SUR-1<sup>-/-</sup> mice ( $n=11$ ); *gray bar*, avexitide-treated SUR-1<sup>-/-</sup> mice ( $n=11$ ).<sup>2</sup>

# Avexitide Significantly Decreased Post-Meal Insulin Levels

PHASE 1, SAD, MAD

Phase 1, IV infusion<sup>1</sup>

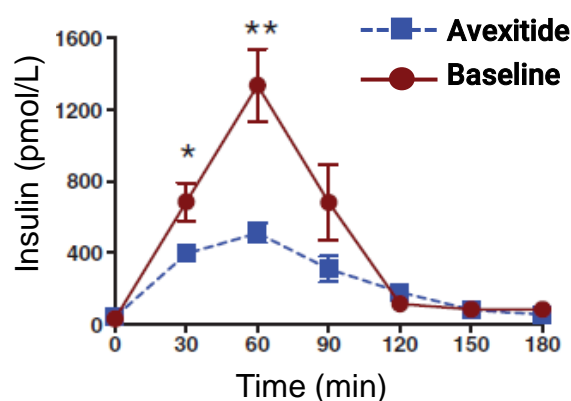
Single Dose, N=8, OGTT



OGTT = oral glucose tolerance test

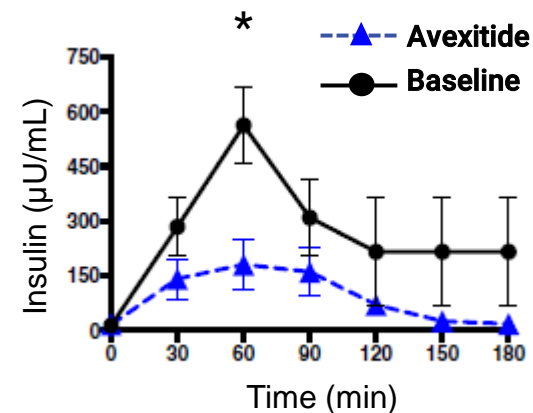
SAD, SC injection<sup>2</sup>

Single Dose, N=8, OGTT



MAD, SC injection<sup>3</sup>

BID Dosing, N=19, OGTT



Consistent and significant decrease in insulin levels across Phase 1, SAD, and MAD trials in people with PBH<sup>1-3</sup>

\*p≤0.05, \*\*p≤0.01

PHASE 2

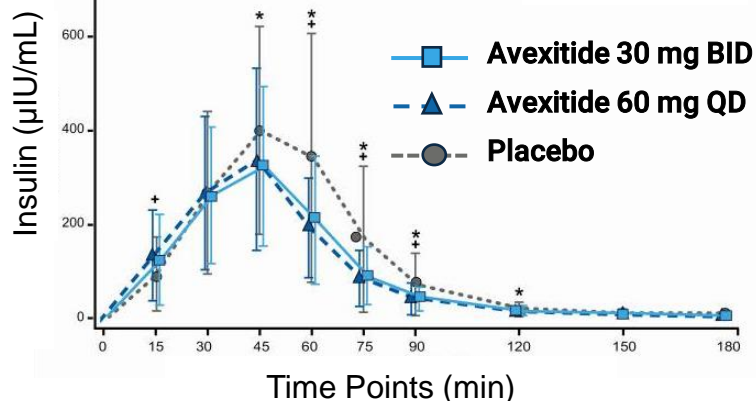


For PREVENT (vs placebo)  
30 mg BID: \*p<0.05  
60 mg QD: +p<0.05

MMTT = mixed meal tolerance test

Phase 2, SC injection<sup>4</sup>

QD/BID Dosing, N=17, MMTT

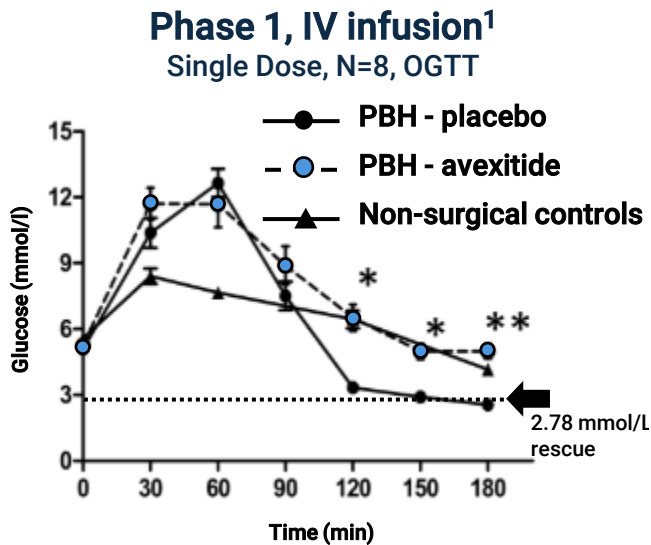


Peak insulin was reduced by 23% (p=0.029) and 21% (p=0.042) following avexitide 30 mg BID and 60 mg QD, respectively, compared with placebo in the Phase 2 PREVENT trial in people with PBH<sup>4</sup>

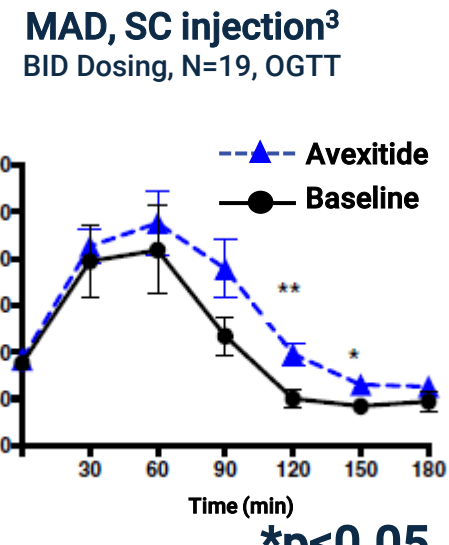
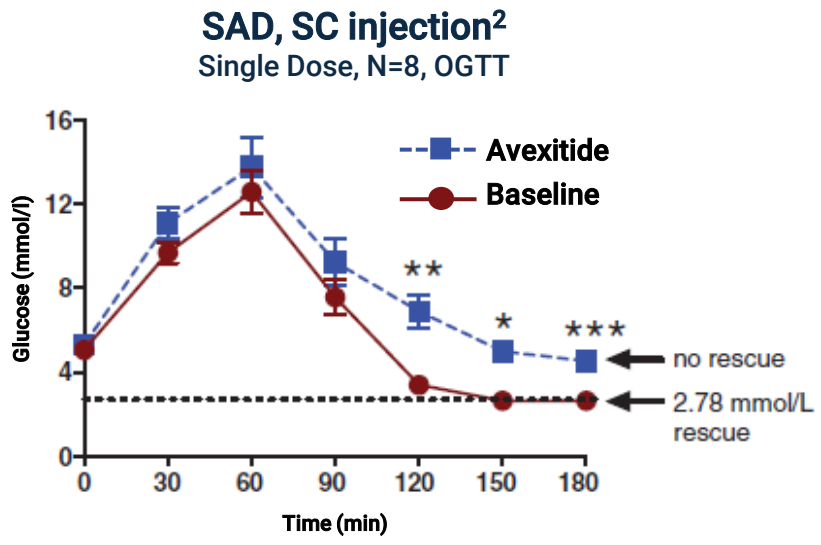


# Avexitide Significantly Stabilized Post-Meal Glucose Levels

PHASE 1, SAD, MAD



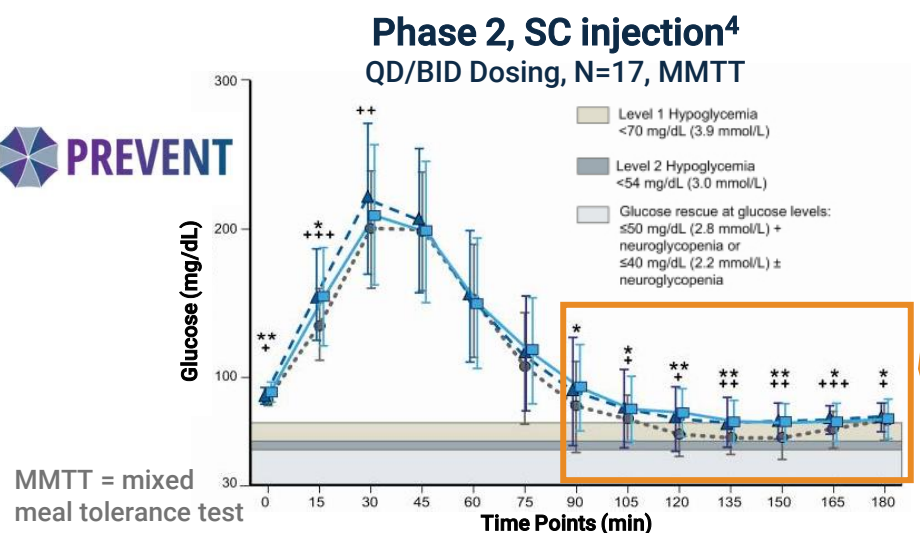
OGTT = oral glucose tolerance test



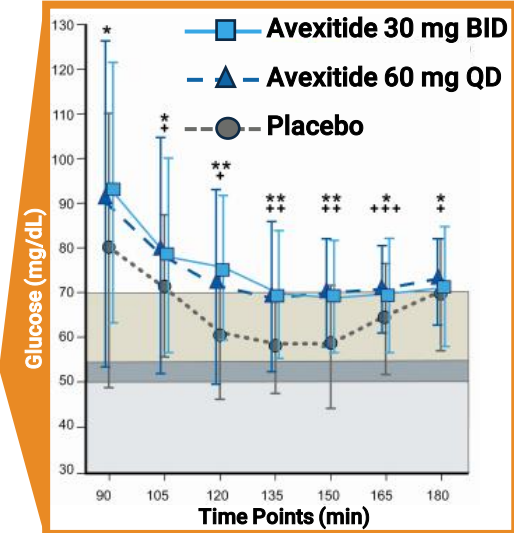
**Consistent and significant stabilization in plasma glucose nadir across Phase 1, SAD, and MAD trials in people with PBH<sup>1-3</sup>**

\*p≤0.05, \*\*p≤0.01, \*\*\*p≤0.001

PREVENT PHASE 2



MMTT = mixed meal tolerance test



**Mean plasma glucose nadir (prespecified primary endpoint) increased by 21% (p=0.001) and 26% (p=0.0002) following avexitide 30 mg BID and 60 mg QD, respectively, compared with placebo in the Phase 2 PREVENT trial in people with PBH<sup>4</sup>**

- Corresponded to 50% and 75% fewer participants requiring rescue, respectively

For PREVENT (vs placebo): 30 mg BID: \*p<0.05, \*\*p<0.01, \*\*\*p<0.001  
60 mg QD: +p<0.05, ++p<0.01, +++p<0.001

# FDA Guidance and Interactions Support Phase 2 and Phase 2b Endpoints as Potential Approvable Phase 3 Primary Endpoint

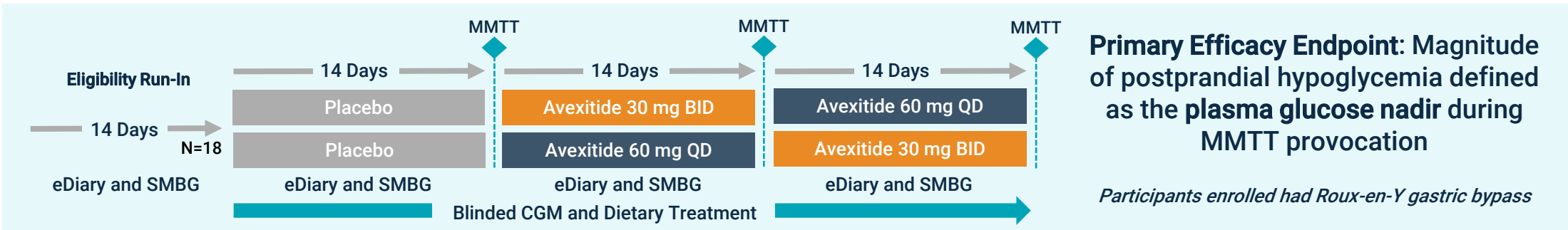
## FDA Breakthrough Therapy Designation

- Post-bariatric hypoglycemia (PBH)
- Congenital hyperinsulinism (HI)

- FDA has agreed to primary endpoint expected to be utilized in Phase 3 program:
  - > Composite of Level 2 and Level 3 Hypoglycemia events
    - FDA guidance for industry for diabetes also supports composite of Level 2 and Level 3 Hypoglycemia events as a potential approvable endpoint<sup>1</sup>
- Phase 2 and Phase 2b study showed avexitide significantly reduced Level 2 and Level 3 events



# PREVENT Phase 2 Study Met Primary and Secondary Endpoints and Demonstrated Significant Reductions in Hypoglycemic Events



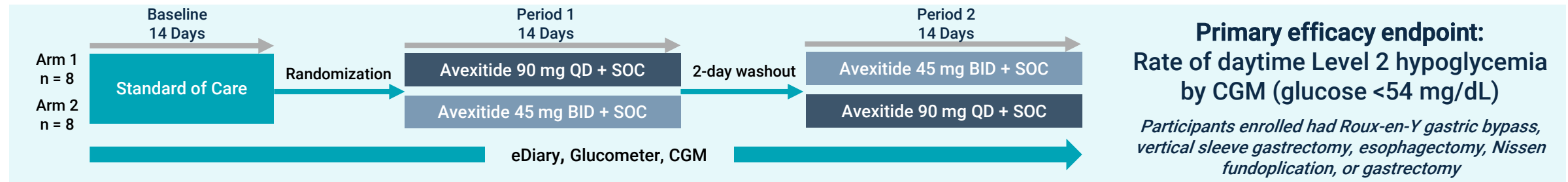
Outcome <sup>a</sup> N=17*	Avexitide 30 mg BID		Avexitide 60 mg QD	
	Improvement vs. Placebo	p value	Improvement vs. Placebo	p value
Post Prandial Glucose Nadir (primary)	21% higher	0.001	26% higher	0.0002
Peak Insulin Level (secondary)	23% lower	0.029	21% lower	0.042
Rate of Level 1 Hypoglycemia	30% lower	0.072	61% lower	0.001
Rate of Level 2 Hypoglycemia	40% lower	0.040	60% lower	0.004
Rate of Level 3 (Severe) Hypoglycemia	23% lower	0.22	56% lower	0.014



- ✓ **Met Primary Endpoint**
  - Stabilized glucose levels
- ✓ **Met Secondary Endpoint**
  - Decreased post meal insulin levels
- ✓ **Significant reduction in the rate of hypoglycemia events**
  - Events cut by more than half with avexitide 60 mg QD

<sup>a</sup>Level 1 hypoglycemia: self-monitoring of blood glucose (SMBG) <70 mg/dL; Level 2 hypoglycemia: SMBG <54 mg/dL; Level 3 hypoglycemia: a severe event characterized by altered mental and/or physical functioning that requires assistance from another person for recovery. Primary and secondary endpoints were captured during mixed meal tolerance test (MMTT) in Clinical Research Unit. Rates of Levels 1, 2, and 3 hypoglycemia shown were exploratory endpoints captured by SMBG/eDiary in the outpatient setting.

# A Phase 2b Study of Higher Dose Avexitide in Broader Population Also Demonstrated Significant Reductions in Hypoglycemic Events



eDiary and SMBG Outcome N=16	Avexitide 45 mg BID		Avexitide 90 mg QD	
	Decrease from Baseline	p value	Decrease from Baseline	p value
Rate of Level 1 Hypoglycemia	54% lower	0.003	68% lower	0.0005
Rate of Level 2 Hypoglycemia	57% lower	0.003	53% lower	0.004
Rate of Level 3 (Severe) Hypoglycemia	68% lower	0.0003	66% lower	0.0003

- Avexitide also significantly decreased % time in hypoglycemia <70 mg/dL and <54 mg/dL

- ✓ **Second placebo-controlled study**
- ✓ **Met primary endpoint**
  - Stabilized glucose levels leading to fewer daytime level 2 hypoglycemia events as measured by CGM
- ✓ **Significant reduction in the *rate* of severe Level 3 hypoglycemia**
- ✓ **Significant reduction of *time* in hypoglycemia**

# Avexitide was Generally Well-Tolerated with a Favorable Safety Profile Across Both Phase 2 Trials

Phase 2 PREVENT Study <sup>1</sup>	Phase 2b Study <sup>2</sup>
AEs generally mild to moderate and transient	AEs generally mild to moderate and transient
No treatment-related serious AEs <ul style="list-style-type: none"> <li>• 1 serious adverse event (presyncope during avexitide 60 mg once daily) occurred; reported as unrelated to study drug and self-limited</li> </ul>	No serious AEs
Most common AEs were injection site bruising, headache, and nausea	Most common AEs were diarrhea, headache, bloating, and injection site reaction/bruising
No participant withdrawals	No participant withdrawals

No clinically relevant increases were observed in fasting or peak postprandial plasma glucose levels (i.e., no hyperglycemia observed)

# Participant Testimonials in Phase 2b Study Support Meaningful Benefit

## AVEXITIDE STUDY TEAM

Termeh Shamloo

Stanford University School of Medicine

Dalia Perelman, RD

Stanford University School of Medicine

Colleen Craig, MD

Eiger BioPharmaceuticals, Inc.

Tracey McLaughlin, MD, MS

Stanford University School of Medicine

## STUDY PARTICIPANTS

*"My husband noted I'm in a much better mood, and my nocturnal hypoglycemia was all gone."*

*"Experience was amazing..."*

*"I felt great and normal after a very long time - very happy."*

*"I'm back to practicing as a [professional] with full cognitive functioning."*

*"Feeling protected, mood is much better, the explosive behavior has been much better."*

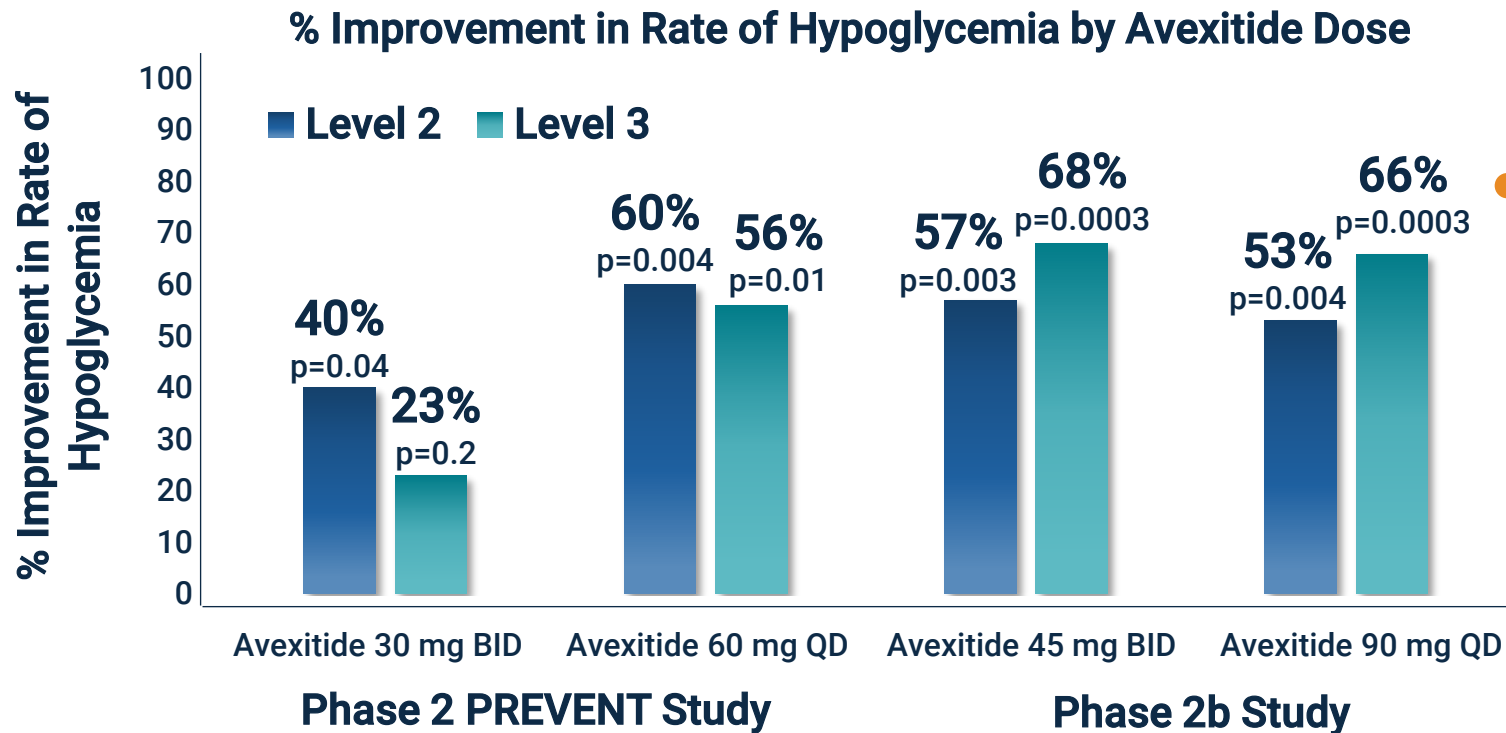
*"Memory loss and recall improved."*

*"I feel like myself again after a very long time."*



*These are individual experiences and not necessarily representative of all clinical trial participants.*

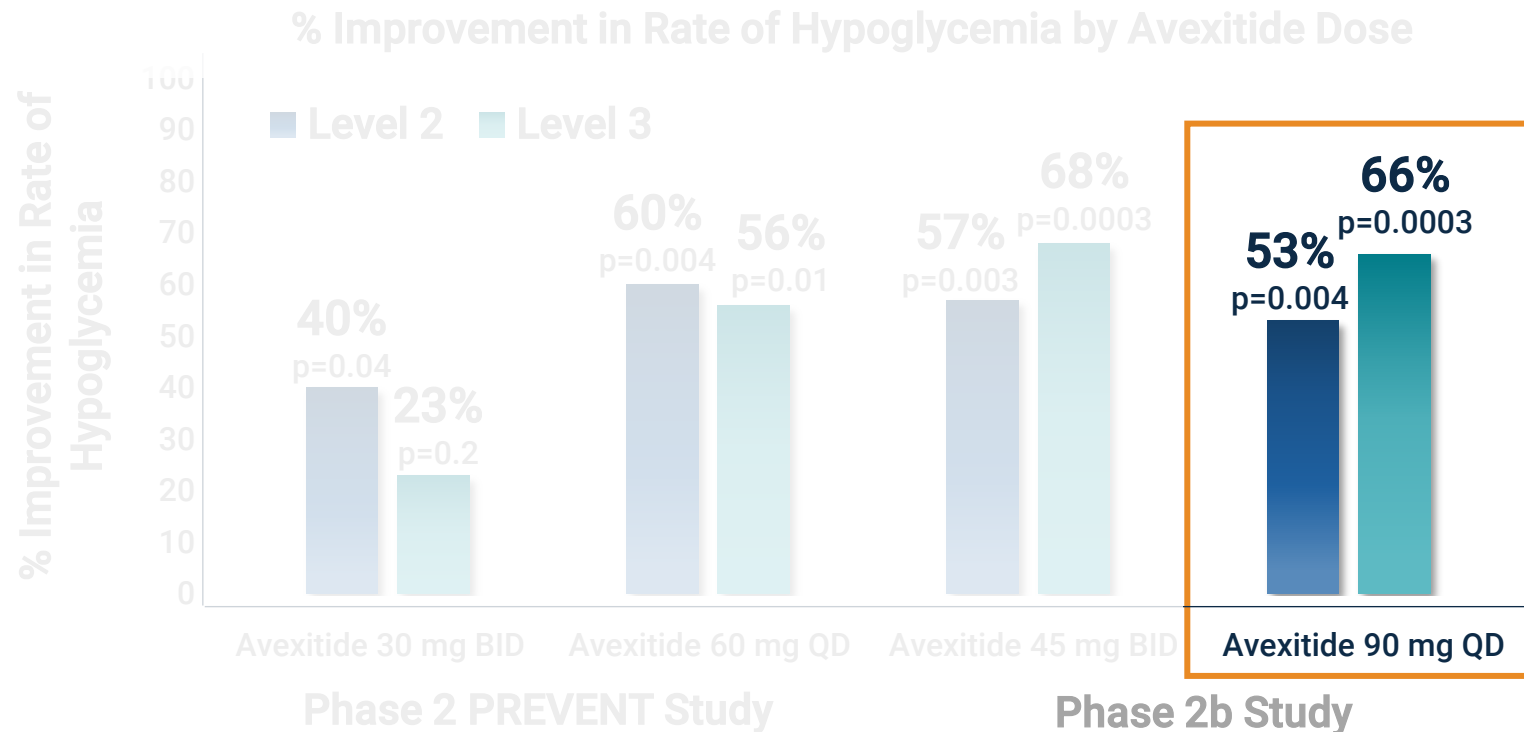
# Avexitide Significantly Reduced Rates of Hypoglycemia in Two Phase 2 Clinical Trials in People with PBH



Avexitide cuts rates of hypoglycemia events by >50%

# Planned Phase 3 Designed To Leverage Success from Phase 2 and Phase 2b

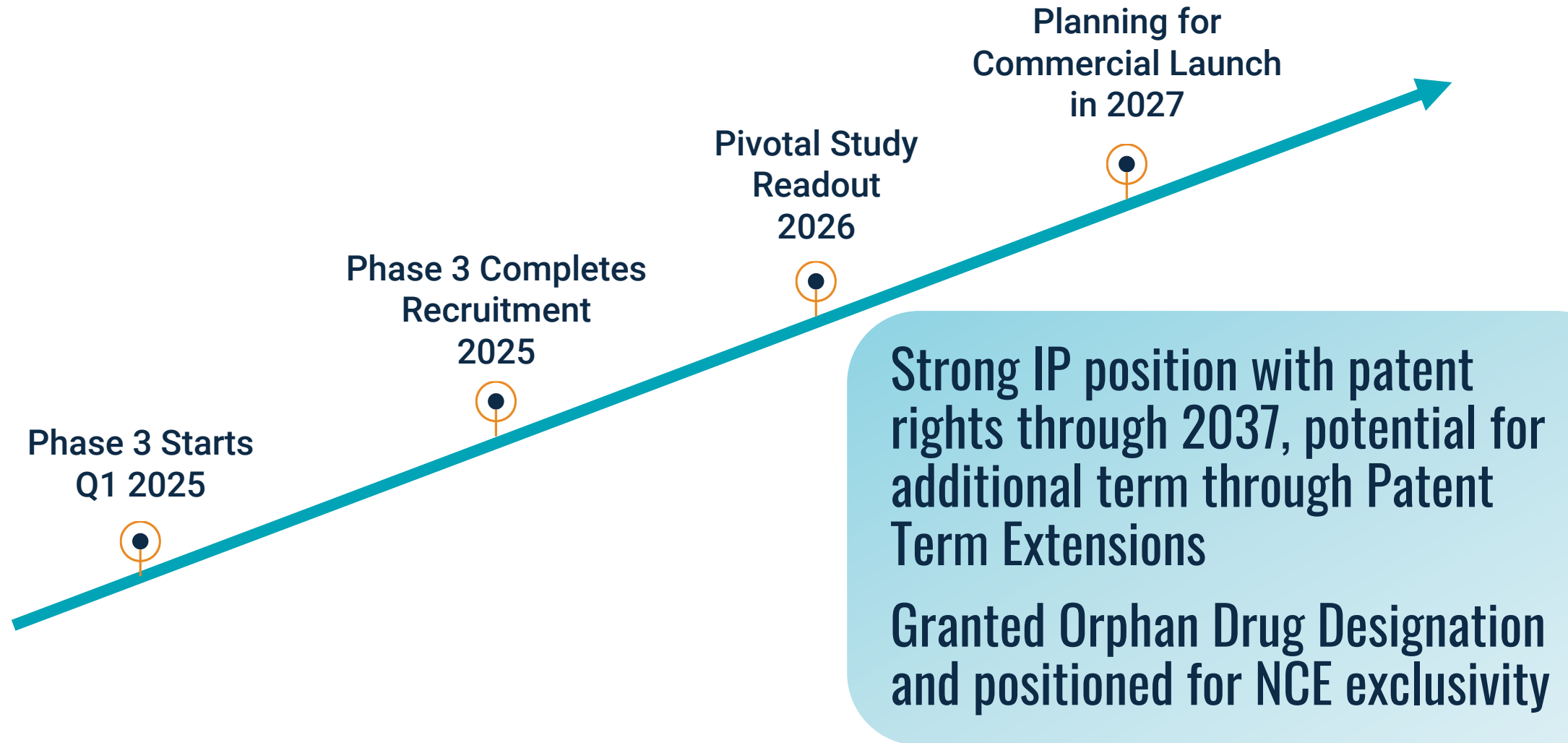
Consistent, dose-dependent effects enable dose selection for evaluation in planned Phase 3 program in PBH



Phase 3 program will evaluate 90 mg QD in people living with PBH

FDA-agreed upon primary endpoint: Composite of Level 2 and Level 3 Hypoglycemia events

# Phase 3 to Begin Q1 2025, Readout in 2026



# Financial Terms for Acquisition of Avexitide

<b>Up Front Payment</b>	<ul style="list-style-type: none"><li>• \$35.1M using cash on hand*</li></ul>
<b>Future Royalties</b>	<ul style="list-style-type: none"><li>• 3% royalty on future sales of avexitide in PBH</li></ul>

**\$373.3M in cash, cash equivalents, and short-term investments as of 3/31/24**



# A Growing Pipeline of Therapies to Serve Communities with High Unmet Needs

<b>AVEXITIDE</b> GLP-1 RECEPTOR ANTAGONIST	PRECLINICAL	IND-ENABLING STUDIES	PHASE 1	PHASE 2	PHASE 3	COMMERCIAL	EXPECTED UPCOMING MILESTONE(S)
Post-Bariatric Hypoglycemia (PBH)	FDA BREAKTHROUGH DESIGNATION						Phase 3 program begins in Q1 2025; Completes recruitment in 2025; Readout 2026, Planning for Commercial Launch in 2027
Congenital Hyperinsulinism (HI)	FDA BREAKTHROUGH DESIGNATION						Engaging physician and community experts in discussions around next steps for clinical development
<b>AMX0035</b> SODIUM PHENYL BUTYRATE (PB) AND TAURURSODIOL (TURSO, ALSO KNOWN AS URSODOXICOLTAURINE)	PRECLINICAL	IND-ENABLING STUDIES	PHASE 1	PHASE 2	PHASE 3	COMMERCIAL	EXPECTED UPCOMING MILESTONE(S)
Wolfram Syndrome							FDA Feedback; Report 24-week topline data in Fall 2024
Progressive Supranuclear Palsy (PSP)							Data from interim analysis expected in mid-2025
<b>AMX0114</b> ANTISENSE OLIGONUCLEOTIDE	PRECLINICAL	IND-ENABLING STUDIES	PHASE 1	PHASE 2	PHASE 3	COMMERCIAL	EXPECTED UPCOMING MILESTONE(S)
Amyotrophic Lateral Sclerosis (ALS)							Initiate multiple ascending dose clinical trial in people with ALS in second half of 2024

# Avexitide is a Compelling Asset with FDA Breakthrough Therapy Designation

Novel, first-in-class GLP-1 receptor antagonist with the potential to treat hyperinsulinemic hypoglycemia



Sizable and debilitating orphan indications with no approved treatment options



Clear match of mechanism of disease (hyperinsulinemic hypoglycemia) and mechanism of potential treatment



Highly statistically significant and clinically meaningful data with well-tolerated safety profile replicated across five clinical trials of PBH



Builds on Amylyx' endocrine and neuroscience expertise



Rapid path to Phase 3 based on outcomes met in Phase 2 and Phase 2b; Plan to utilize FDA-agreed upon primary endpoint in Phase 3

**Data from pivotal post-bariatric hypoglycemia (PBH) Phase 3 program expected in 2026, planning for commercial launch in 2027**



# Q&A Session