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Durable Responses to Low Dose Investigational Gene Therapy BB-301 in Patients with Oculopharyngeal Muscular Dystrophy with Dysphagia at 12-Months and 24-Months and Improved Depth of Response to High Dose BB-301

American Society of Cell & Gene Therapy

May 15, 2026

NASDAQ
BNTC

Safe Harbor Statement

Except for the historical information set forth herein, the matters set forth in this presentation include forward-looking statements, including statements regarding Benitec's plans to develop and commercialize its product candidates, the timing of the completion of pre-clinical and clinical trials, the timing of the availability of data from our clinical trials, the timing and sufficiency of patient enrollment and dosing in clinical trials, the timing of expected regulatory filings and related actions, and potential clinical utility and potential attributes and benefits of ddRNAi and Benitec's product candidates, and other forward-looking statements.

These forward-looking statements are based on the Company's current expectations and subject to risks and uncertainties that may cause actual results to differ materially, including unanticipated developments in and risks related to: the success of our plans to develop and potentially commercialize our product candidates; the timing of the completion of preclinical studies and clinical trials; the timing and sufficiency of patient enrollment and dosing in any future clinical trials; the timing of the availability of data from our clinical trials; the timing and outcome of regulatory filings and approvals and related actions; the development of novel AAV vectors; our potential future out-licenses and collaborations; the plans of licensees of our technology; the clinical utility and potential attributes and benefits of ddRNAi and our product candidates, including the potential duration of treatment effects and the potential for a "one shot" cure; our intellectual property position and the duration of our patent portfolio; expenses, ongoing losses, future revenue, capital needs and needs for additional financing, and our ability to access additional financing given market conditions and other factors; the length of time over which we expect our cash and cash equivalents to be sufficient to execute on our business plan; unanticipated delays; further research and development and the results of clinical trials possibly being unsuccessful or insufficient to meet applicable regulatory standards or warrant continued development; the ability to enroll sufficient numbers of patients in clinical trials; determinations made by the FDA and other governmental authorities and other regulatory developments; the Company's ability to protect and enforce its patents and other intellectual property rights; the Company's dependence on its relationships with its collaboration partners and other third parties; the efficacy or safety of the Company's products and the products of the Company's collaboration partners; the acceptance of the Company's products and the products of the Company's collaboration partners in the marketplace; market competition; sales, marketing, manufacturing and distribution requirements; greater than expected expenses; expenses relating to litigation or strategic activities; the impact of, and our ability to remediate, the identified material weakness in our internal controls over financial reporting; the impact of local, regional, and national and international economic conditions and events; and other risks detailed from time to time in the Company's reports filed with the Securities and Exchange Commission. The Company disclaims any intent or obligation to update these forward-looking statements.

Oculopharyngeal Muscular Dystrophy (OPMD)

A rare autosomal-dominant degenerative muscle disorder

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OPMD is a Debilitating Progressive Disease With No Approved Therapies

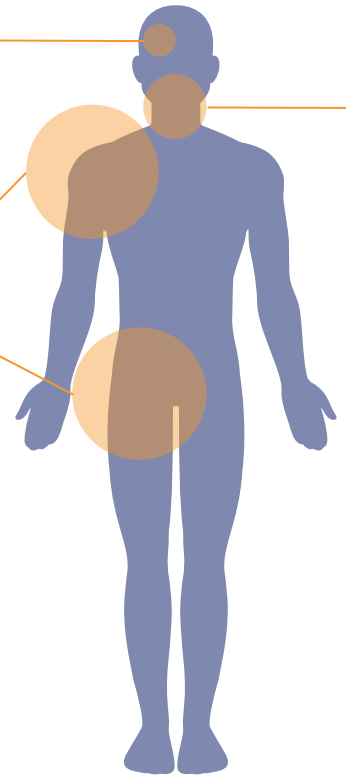
OPMD is a **rare autosomal-dominant degenerative muscle disorder,** caused by a mutation in the poly(A)-binding protein nuclear **1 (PABPN1) gene**

PABPN1 is a ubiquitous protein that controls the length of mRNA poly(A) tails, mRNA export from the nucleus and alternative poly(A) site usage

OPMD ONSET: TYPICAL AGE IS 40s-50s

Eyelid drooping **(ptosis)**

Proximal limb weakness



Difficulty swallowing **(dysphagia)** and choking during meals

Progressive dysphagia impacts 97% of OPMD patients and is a severe, life-threatening complication of OPMD which can lead to chronic choking, malnutrition, aspiration pneumonia and death

~15K Patients in North America, Europe and Israel

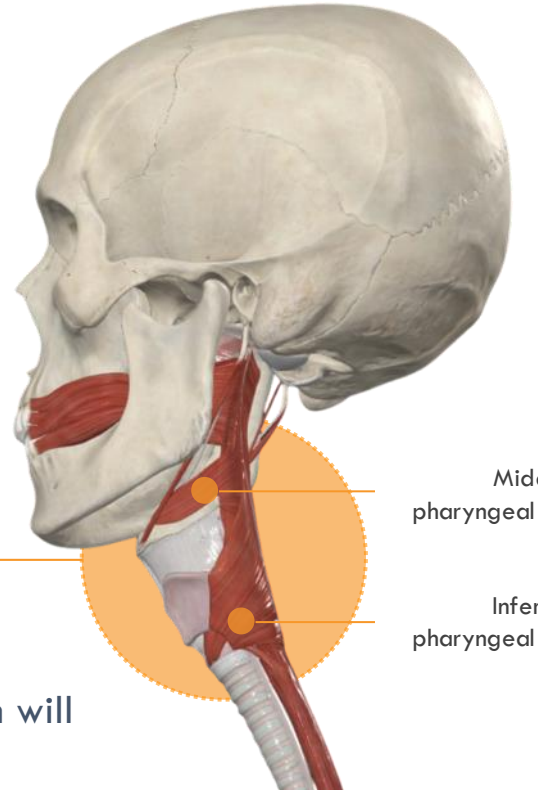
BB-301 is the only clinical-stage therapeutic in development designed to treat dysphagia in patients with OPMD

Swallowing Overview and the Rationale for BB-301 Evaluation in OPMD

OPMD weakens pharyngeal muscles, causing severe swallowing difficulties **(dysphagia)**

Dysphagia leads to choking, malnutrition, aspiration pneumonia[1]

Anatomical Structures of the Pharynx and BB-301 Injection Sites



18-400 **times per hour** a healthy human will spontaneously swallow[2]

BB-301 is designed to increase muscle mass and function, reducing dysphagia and improving patient outcomes

BB-301 is delivered to the pharyngeal constrictor muscles via **direct intramuscular injection in the operating room to maximize local benefit and minimize systemic exposure**

1. https://www.mayodinic.org/diseases-conditions/dysphagia/symptoms-causes/syc-20372028 2. Rudney et al. (1995)

BB-301: A Disease-Modifying Genetic Medicine for OPMD-Related Dysphagia

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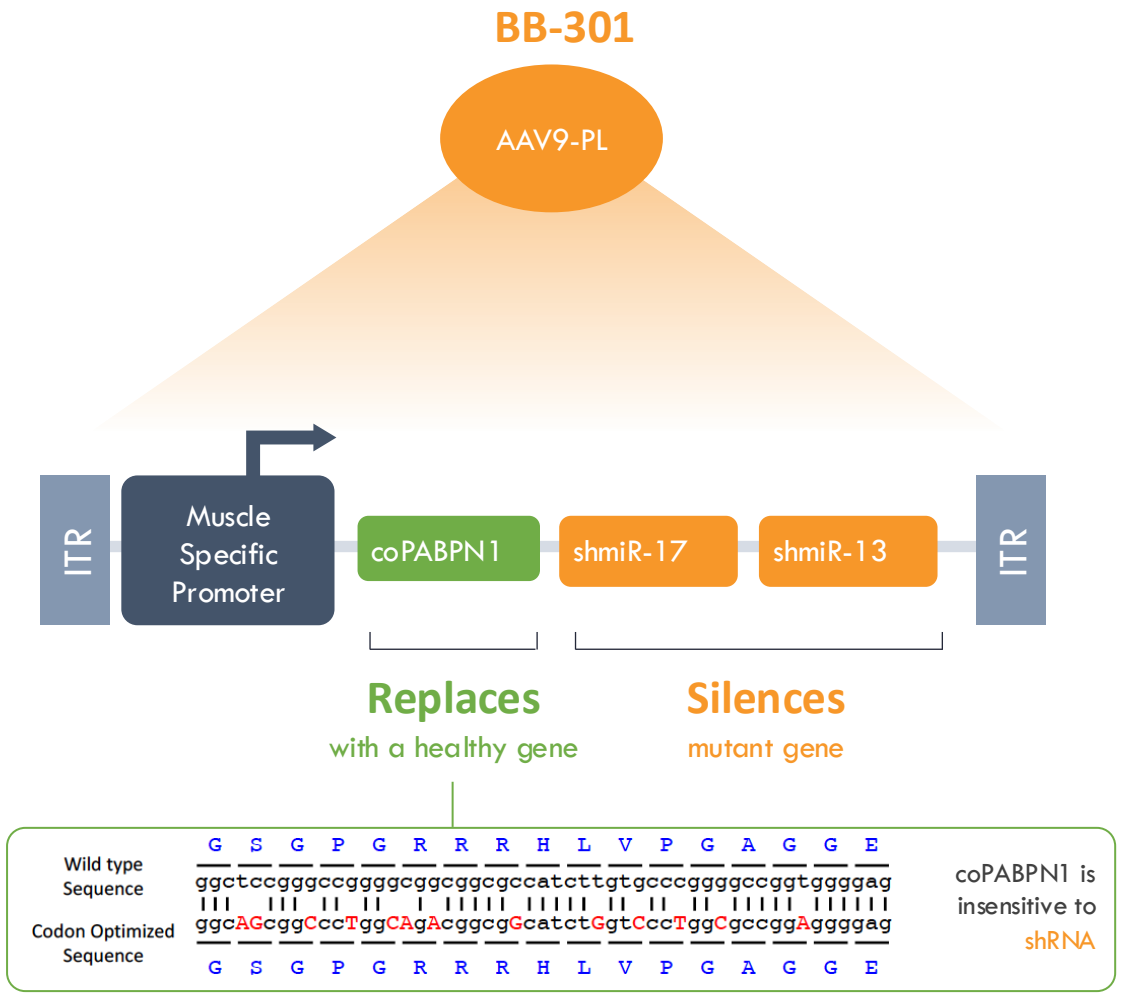
BB-301: Mechanism of Action

BB-301 uses DNA-directed RNA interference (ddRNAi) to simultaneously

SILENCE THE **mutant gene** + **REPLACE** WITH A **functional gene**

potentially providing a permanent solution with a single administration



Restoration of functional PABPN1

Strings-Ufombah, et al., Molecular Therapy: Nucleic Acids, Vol. 24, 67-78, June 2021

Clinical Study Design and Key Efficacy Endpoints of the OPMD Natural History Study and the BB-301 Phase 1b/2a First-in-Human Study

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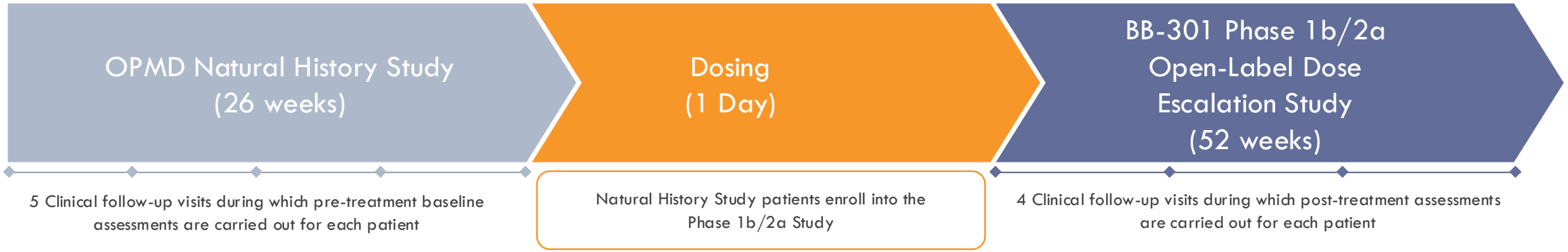
BB-301: Clinical Development Program



- 23 patients have been enrolled in the OPMD Natural History Study to date
  - Natural History Study patients may be eligible for the pivotal study
- All patients are blinded to their Total SSQ Scores and VFSS (TPR and Sequential Swallowing) assessment results, and the Central Reader for the VFSS assessments is blinded to the SSQ Scores for all patients
- The BB-301 Phase 1b/2a Open-Label Dose Escalation Study can enroll up to 30 patients across 3 doses
  - **The primary endpoint is safety, and secondary endpoints focus on qualitative and quantitative assessments of swallowing function.**
  - **There have been no treatment-related SAEs in any patient dosed with BB-301 to date.**
  - **Clinical results from the first 4 patients of Cohort 1 (1.2e13 vg/patient) who have completed the statistical follow-up period of 12-months post-BB-301 treatment are presented here.**
  - **Interim clinical results (3-months post-BB-301 treatment) from the first patient in Cohort 2 (1.8e13 vg/patient) are presented here.**

BB-301: Serial Characterization of Dysphagia Severity Informs Efficacy Assessment

- The Natural History Study and BB-301 Phase 1b/2a Clinical Study include comprehensive assessments of dysphagia approximately every 3 months
- The total dysphagic symptom burden experienced by OPMD patients has several known underlying contributors
- The serial assessments of dysphagia facilitated the creation of a multi-component responder analysis which incorporates multiple discrete assessments that holistically assess disease progression and treatment benefit of BB-301

Efficacy assessments were derived from literature-based methods used to assess OPMD dysphagic symptom burden and include patient-reported outcomes, objective anatomic assessments, and functional parameters

Patient-Reported Oral-Pharyngeal Dysphagia via use of a clinically validated 17-question patient reported outcome instrument, Sydney Swallow Questionnaire **(SSQ)**

Videofluoroscopic Swallowing Studies **(VFSS)** of liquids and solids for anatomic and functional assessments of:

- Pharyngeal constrictor muscle function via assessment of Pharyngeal Area at Maximum Pharyngeal Constriction **(PhAMPC)**
- Swallowing Efficiency via assessment of post-swallow accumulation of food/liquid material
  - Total Pharyngeal Residue **(TPR)**
  - Normalized Residue Ratio Scale, Valleculae **($NRRS_v$)**
- Swallowing Effectiveness via assessment of frequency of pathologic sequential swallows **(SEQ)**

Functional swallowing capacity as measured by the Cold Water Timed Drinking Test **(CWDT)**

Scoring Clinical Success: BB-301's Responder Framework

1. **Patient-Reported Oral-Pharyngeal Dysphagia (SSQ)**
   Criteria: SSQ score must not worsen after treatment
2. **Pharyngeal Constrictor Muscle Function (PhAMPC)**
   Criteria: Statistical criteria* met in at least 1 of 4 swallowing tasks
3. **Frequency of Pathologic Sequential Swallows (SEQ)**
   Criteria: At least a 30% decrease in sequential swallows post-treatment
4. **Swallowing Efficiency (NRRSv or TPR)**
   Criteria: Statistical criteria* met in at least 1 of 8 swallowing tasks
5. **Functional Swallowing Capacity (CWDT)**
   Criteria: Statistical criteria* met for the cold-water timed drinking test

TOTAL RESPONDER SCORING

MAXIMUM SCORE
5 "Yes" values (one per measure)

RESPONDER STATUS
Achieving ≥2 "Yes" values (≥40%) qualifies a patient as a responder

*Formal statistical criteria were submitted to FDA over the course of the interactive process that supported the grant of Fast Track Designation for BB-301

BB-301 Phase 1b Study: Cohort 1 Study Completers

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All Cohort 1 Study Completers are Formal Responders

Patient	Post-Treatment Statistical Follow-up Period	Response Criteria Achieved	Total Responder Score	Responder
1	12- months	SSQ, PhAMPC, Pharyngeal residue, CWDT	4	✓
2	12- months	SSQ, PhAMPC, SEQ, CWDT	4	✓
3	12- months	SSQ, PhAMPC, SEQ, Pharyngeal residue	4	✓
4	12- months	SSQ, PhAMPC, Pharyngeal residue	3	✓

Completers are Patients that have reached the 12-month post-BB-301-treatment assessment time-point

BB-301 Phase 1b Study: Long Term Efficacy Trends for Cohort 1

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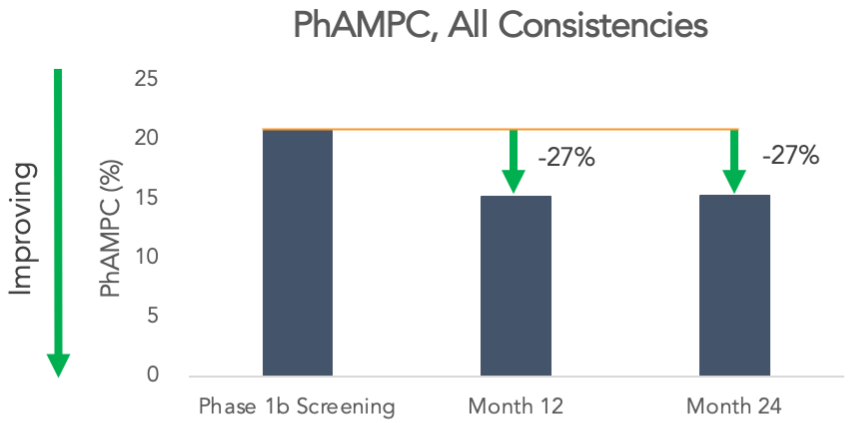
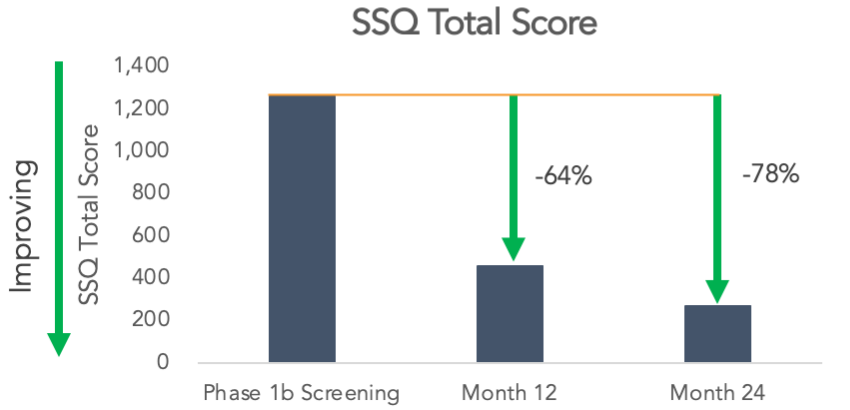
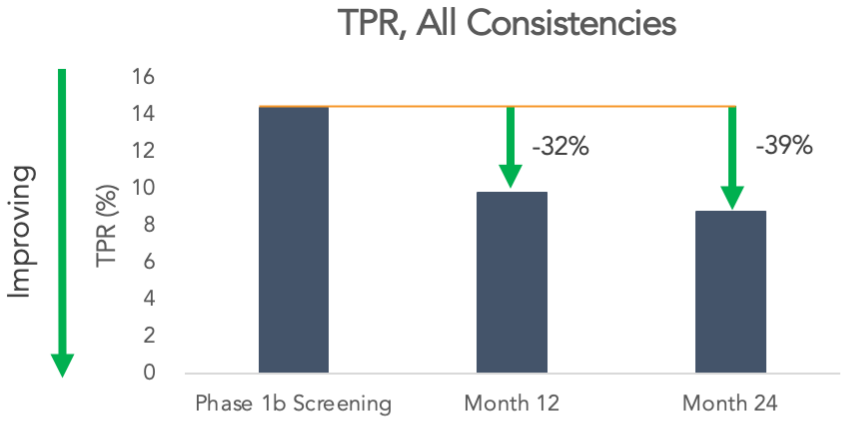
Long-Term Efficacy Trends: 24-months Post BB-301 Treatment, Patient 1 of Cohort 1 Experienced Continued Robust, Disease-Modifying, Outcomes

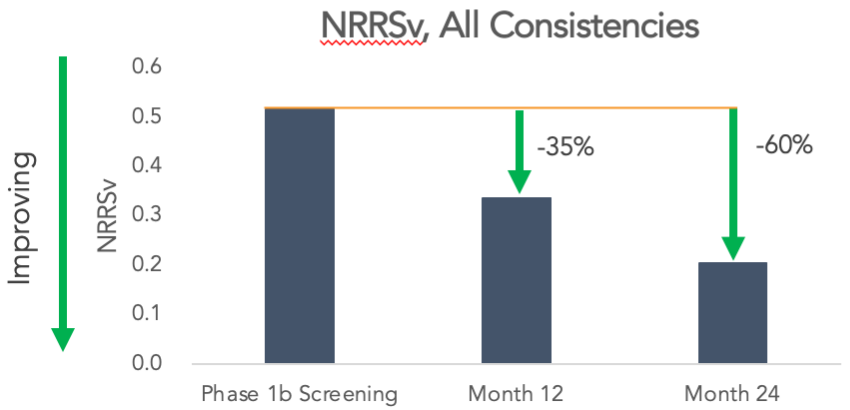


Improvements in throat closure for both liquids and solid food were maintained over time



Total dysphagic symptom burden continued to meaningfully decline over time





Throat emptying ability continued to meaningfully improve over time for both liquids and solid food

Patient 1 of Cohort 1 experienced deepening improvements in both post-swallow pharyngeal residue and total dysphagic symptom burden 24-months post-BB-301 treatment

BB-301 Phase 1b Study: Cohort 1 Dose vs. Cohort 2 Dose

Preliminary comparisons of efficacy trends

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Significant Improvements in Throat Closure, Post-Swallow Pharyngeal Residue, and Total Dysphagic Symptom Burden Observed Following High Dose BB-301 Treatment

- Patient A (Cohort 1) and Patient B (Cohort 2) had comparable baseline functional and anatomical deficits.
- Patient B (Cohort 2) was safely treated with BB-301.
- When comparing 3-month post-treatment data for both Patient A and Patient B, Patient B demonstrated improved depth of response to high dose BB-301.

	SSQ	PhAMPC		TPR		$NRRS_V$	
		Liquids	All Consistencies	Liquids	All Consistencies	Liquids	All Consistencies
Patient A Post-treatment Improvement	**7.4% improvement**	**8.5% improvement**	**8.2% improvement**	**6.9% worsening**	**5.7% worsening**	**2.2% improvement**	**3.2% improvement**
Patient B Post-treatment Improvement	**68.3% improvement**	**23.6% improvement**	**19.1% improvement**	**43.6% improvement**	**43.7% improvement**	**61.1% improvement**	**57.3% improvement**

Preliminary interim clinical results demonstrate improved depth of response to high dose BB-301 at the 3-month post-treatment timepoint

BB-301 Responder Status: Interim Clinical Results (3-Months Post-BB-301 Treatment) Indicate the First Patient in Cohort 2 is a Responder to BB-301

Cohort	Patient	Post-Treatment Statistical Follow-up Period	Response Criteria Achieved	Total Responder Score	Responder
2	B	3-Months	SSQ, PhAMPC, Pharyngeal residue	3	

Positive Interim Clinical Results and Regulatory Milestones Position BB-301 as the First Potential Disease-Modifying Genetic Medicine for OPMD-Related Dysphagia

PHASE 1b/2a CLINICAL EFFICACY

- **ROBUST RESPONSES TO BB-301 IN COHORT 1 AND COHORT 2**
- **MEANINGFUL IMPROVEMENTS POST-BB-301 ADMINISTRATION ACROSS KEY ENDPOINTS**
  - Improved **patient reported outcome**
  - Improved **throat closure**
  - Reduced **pharyngeal residue**
  - Improved **functional swallowing capacity**

SAFETY

- **NO TREATMENT-RELATED SEVERE ADVERSE EVENTS**

REGULATORY

- **FAST TRACK DESIGNATION (FDA)**
- **ORPHAN DRUG DESIGNATION (FDA & EMA)**


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