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A Phase IIIb/IV, randomized, double-blind, parallel-group, placebo-controlled, trial to evaluate the efficacy and safety of daily subcutaneous injections of elamipretide in patients with genetically confirmed Barth syndrome

Submission date 01/01/2026	**Recruitment status** Recruiting	[X] Prospectively registered [ ] Protocol [ ] Statistical analysis plan [ ] Results [ ] Individual participant data [X] Record updated in last year
Registration date 07/04/2026	**Overall study status** Ongoing	
Last Edited 07/05/2026	**Condition category** Genetic Diseases	

Plain English summary of protocol

Background and study aims

The purpose of this trial is to evaluate if elamipretide (an investigational drug) is safe and effective in people who have genetically confirmed Barth syndrome when compared to placebo (inactive substance). In the United States, elamipretide (Forzinity™) has gained accelerated approval in patients with Barth syndrome weighing at least 30 kg, pending the outcome of this Phase 4 confirmatory trial. This product has not been approved outside of the United States. There are no available therapies approved for Barth syndrome in all ex-US countries.
Elamipretide is a protective agent specific to the mitochondria of cells (where energy for the cell is produced). It helps the cell to stay healthy in many different diseases (including those related to mitochondrial disorders impacting the heart, skeleton, and muscular systems of the body).
The trial is being conducted to find out how well once daily subcutaneous (under the skin) injections of elamipretide help to compensate for cardiolipin (a phospholipid found inside the mitochondria) deficiency and protect against further cardiolipin degradation (breakdown) to restore bioenergetic function (energy) in subjects who have Barth syndrome.
The primary endpoint of this trial is to confirm the effectiveness of once-daily subcutaneous injections of elamipretide in subjects who have genetically confirmed Barth syndrome.
The secondary endpoints of this trial are to evaluate the safety and tolerability of once-daily subcutaneous injections of elamipretide and evaluate the pharmacokinetic profile (how the body absorbs, utilises, and excretes) of elamipretide and its metabolites (related small molecules).

Who can participate?

Males aged 5 years of age and over with genetically confirmed Barth syndrome, located globally, including in the United Kingdom, European Union, Australia and China

What does the study involve?
This trial is:
1. Randomised: a computer program will be used to randomly determine which treatment group each participant is assigned to.
2. Placebo-controlled: eligible participants will be randomly assigned to receive either elamipretide (investigational drug) or a placebo (inactive substance).
3. Double-masked: both the trial doctor and the participant will not know which treatment group the participant has been randomly assigned to receive.
Participants will receive injections under the skin of either elamipretide (investigational drug) or placebo (inactive substance), which are administered daily for approximately 72 weeks. The trial doctors, staff and participants will not know which treatment is given. It is important that the trial staff and participants do not know which group they are assigned to. This is to prevent affecting the test results by accident.

What are the possible benefits and risks of participating?
Participants may not benefit directly from taking part but the results may benefit people with Barth syndrome in the future. Participants may gain general health information through laboratory tests and functional tests performed at designated time points throughout the participant's study participation. Participants will be encouraged to remain in the study regardless of any changes in treatment so that information about treatment and outcomes related to Barth syndrome can be collected. After completion of the trial, participants may be eligible to enrol in the open-label extension trial, receiving active treatment, as determined by the investigator. Previous clinical trials have been conducted where participants have received elamipretide intravenously (into the bloodstream) and subcutaneously. Some side effects and discomforts may not yet be known; however, the risks and benefits of the trial drug will be monitored throughout the duration of this trial.

Where is the study run from?
Parexel International (Ireland)

When is the study starting and how long is it expected to run for?
May 2026 to September 2029

Who is funding the study?
Stealth BioTherapeutics Inc. (USA)

Who is the main contact?
Rekha Sathyanarayana (Stealth BioTherapeutics), Rekha.Sathyanarayana@stealthbt.com

Contact information

Type(s)
Scientific, Public

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None Parexel CTRS

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Integrated Research Application System (IRAS)
1013337

Central Portfolio Management System (CPMS)
71267

Sponsor's protocol code number
SPIBA-401

Study information

Scientific Title
A Phase IIIb/IV, randomized, double-blind, parallel-group, placebo-controlled, trial to evaluate the efficacy and safety of daily subcutaneous injections of elamipretide in patients with genetically confirmed Barth syndrome

Acronym
4TAZPower

Study objectives
Primary objective:
Evaluate the efficacy of once daily subcutaneous (SC) injections of elamipretide in subjects who have genetically confirmed Barth Syndrome

Secondary objectives:
1. Evaluate the safety and tolerability of once daily SC injections of elamipretide in subjects who have genetically confirmed Barth Syndrome
2. Evaluate the pharmacokinetic (PK) profile of elamipretide and its metabolites in subjects who have genetically confirmed BTHS

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 24/02/2026, South West - Central Bristol Research Ethics Committee (2 Redman Place, Stratford, London, E20 1JQ, United Kingdom; -; centralbristol.rec@hra.nhs.uk), ref: 26/SW/0009

Primary study design
Interventional

Allocation
Randomized controlled trial

Masking
Blinded (masking used)

Control
Placebo

Assignment
Single

Purpose
Treatment

Study type(s)

Health condition(s) or problem(s) studied
Barth Syndrome

Interventions
Subjects will be randomized (1:1) to subcutaneous (SC) injections of either elamipretide or placebo for up to 72 weeks of treatment by a central randomization. Trial personnel, Sponsor, CRO and trial subjects will be masked to treatment throughout the study.

Intervention Type
Drug

Phase
Phase III/IV

Drug/device/biological/vaccine name(s)
Elamipretide

Primary outcome(s)
Composite normalized score of the following three functional tests: 6MWT, 3TUG, and 5XSST at baseline and week 72

Key secondary outcome(s)

1. Functional capacity measured using the 6-Minute Walk Test (6MWT) at baseline and week 72
2. Functional mobility measured using the Triple Timed Up and Go Test (3TUG) at baseline and week 72
3. Lower limb strength and functional mobility measured using the 5 Times Sit to Stand Test (5XSST) at baseline and week 72
4. Patient disease assessment measured using the Patient Global Impression of Severity (PGI-S) at baseline and week 72
5. Clinician disease assessment measured using the Clinician Global Impression of Severity (CGI-S) at baseline and week 72
6. Knee extensor muscle strength measured by handheld dynamometry (HHD) at baseline and week 72
7. Hip flexor muscle strength measured by HHD at baseline and week 72

Completion date
30/03/2029

Eligibility

Key inclusion criteria
1. Willing and able to provide signed informed consent form (ICF) prior to participation in any trial-related procedures. If applicable, informed consent in writing from parent(s) or legally acceptable representative(s) and, informed assent from subject (if age appropriate according to local requirements) should be provided.
2. Agrees to adhere to the trial requirements for the length of the trial.
3. Must have genetically confirmed Barth syndrome (pathogenic variant in the TAZ gene).
4. Male aged ≥5 years at time of the Screening Visit.
5. Left Ventricular Ejection fraction of ≥50% by 3D Echocardiogram at the Screening Visit.
6. Able to administer IMP or have an appropriate designee who can administer the IMP (i.e., a capable family member or a caregiver).
7. Subjects with female partners of childbearing potential must be willing to use a highly effective method of contraception (e.g., abstinence, dual method of contraception) from the date they sign the ICF until 28 days after the last dose of IMP.

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
5 Years

Upper age limit
100 Years

Sex
Male

Total final enrolment

0

Key exclusion criteria
1. Unable to perform the 6MWT, 3TUG, or 5XSST functional tests or undergo echocardiography.
2. Any disease or medical condition that in the opinion of the Investigator would prevent the subject from successfully participating in the trial and reliably completing the assessments or might confound trial results.
3. Participation in other investigational drug or device clinical trials within 30 days or 5 half-lives (whichever is longer) of Screening; or is currently enrolled in a non-interventional

Date of first enrolment
24/04/2026

Date of final enrolment
30/06/2028

Locations

Countries of recruitment
United Kingdom

England

Australia

Canada

China

France

Ireland

Italy

Netherlands

Study participating centre
Bristol Royal Hospital for Children
Upper Maudlin Street
Bristol
England
BS2 8BJ

Sponsor information

Organisation
Stealth BioTherapeutics (United States)

ROR
https://ror.org/045frfm13

Funder(s)

Funder type

Funder Name
Stealth BioTherapeutics Inc.

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Data sharing statement to be made available at a later date