

PARTICIPANT INFORMATION SHEET

A ketone drink (ΔG°) to improve exercise performance in Parkinson's disease

You are being invited to take part in a research study as you have expressed an interest in doing so. Before you decide to participate, it is very important for you to understand why the research is being done and what it will involve. You can decline to participate in this study at any point.

Please take time to read the following information carefully.

This participant information leaflet is split into two parts:

Part 1

Describes the purpose of this study and what will happen to you if you decide to take part.

Part 2

Has more detailed information about how we will conduct the study.

Please make sure you ask us if there is anything that is not clear or if you would like more information.

Participant Information Sheet (Version 1.7 - 24/02/2019)

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Chief investigator: Professor Michele Hu

IRAS ID no. reference: 257795

ISRCTN16599164

REC reference number: 19/SC/0032

Part 1

The purpose of the study and what will happen to you if you take part.

1. Why have I been invited?

You have been identified as an individual who may meet the eligibility criteria for our study. We hope that you will consider participating in our study and, thereby, make a contribution to the advancement of Parkinson's research.

2. What is the purpose of the study?

To investigate the hypothesis ketone bodies can improve physical exercise performance in individuals with Parkinson's disease.

3. Do I have to take part?

No, it is up to you to decide whether to take part. If you do, you will be given this information sheet to keep and will be asked to sign a consent form. You are free to withdraw at any time without giving a reason. A decision to withdraw, or a decision not to take part, will not affect the standard of any medical care that you may need in the future.

4. What will happen to me if I take part?

Your participation in this study would involve three visits to Oxford Brookes University. Each visit would last about one hour.

During the first visit we will ask you some questions to check whether you are eligible for the study and, if you agree to participate, you will be asked to sign a consent form. We will also ask you to perform a practice exercise test on a stationary bicycle.

During the practice exercise test, you will be asked to pedal on the stationary bicycle as fast as you can for a fixed interval of time (e.g. pedal as fast as you can for 1-minute) and/or pedal at a fixed number of revolutions per minute for as long as you can (e.g. pedal at 90 revolutions per minute).

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until you are too tired to continue). During the test, we will periodically ask you how tired you are on a scale of 1 – 10. You can choose to stop the test at any time.

During the second and third visits, you will perform the exercise test again under slightly different conditions. First, we will ask you to come into the lab after an overnight fast and to consume a study drink containing ketone bodies and/or carbohydrates. Second, we will also ask you to wear a face mask during exercise that captures your exhalations for analysis. Third, before you consume the drink, after you consume the drink, and after you exercise, we will take blood samples. We will likely be able to do so by fingerpick alone, although we may draw blood from your arm instead.

5. What else do I have to do?

Apart from the tests described above, there is nothing else that you need to do.

6. What is the drink that is being tested?

The ketone ester is called ΔG° and is transformed into ketone bodies after being digested. These substances are not naturally found in the human diet but are produced by the liver during carbohydrate starvation as an alternative energy source for the brain.

ΔG° is produced by the parent company TAS, a spin-out company from the University of Oxford's Department of Physiology, Anatomy and Genetics. ΔG° was first invented by Oxford's own Professor Kieran Clarke using a \$10 million grant she received from the United States military to create a product that would enhance soldiers' physical and cognitive performance.

7. What are the potential side effects drinking the ketone ester ΔG° ?

ΔG° is generally well tolerated. You may experience none, some, or all mild episodes of the symptoms listed below:

- Diarrhoea
- Abdominal distension
- Nausea
- Headache
- Dizziness

Published studies, in rodents and healthy human subjects, support ΔG° 's safety and tolerability for longer-term use. In collaborations with UK Sport, numerous studies have been performed on ~250 athletes to determine the effects of single drinks on physical endurance and cellular metabolism without problems. The HVMN ΔG° drink has FDA approval and is commercially available in the United States as a sports supplement.

8. What are the other possible disadvantages and risks of taking part?

Some participants find blood draws/finger pricks painful or have difficulty to access veins. To minimise these problems, all procedures will be performed by experienced personnel or you may prick your own finger if you so choose.

9. What are the possible benefits of taking part?

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ΔG° may acutely improve your exercise tolerance and/or cause you to temporarily experience mental clarity and focus, referred to as “flow state.” Animal evidence suggests that chronic daily consumption of ΔG° may be used to manage the symptoms of Parkinson’s disease and to slow disease progression.

There are no expected long-term benefits of consuming the single dose of ΔG° with which you will be provided during this study.

10. Where can I purchase ΔG° ?

If you would like to purchase ΔG° for yourself after the study is complete, it is currently commercially available as a sports supplement from the biotech company HVMN. The following is a link to the company’s website: <https://hvmn.com/ketone>. Currently, ΔG° starts at 99 USD for a pack of three single doses, although the price is expected to come down as the synthesis process is streamlined and scaled up.

11. What if there is a problem?

Any complaint about the way you have been dealt with during the study or any possible harm you might suffer will be addressed. Contact information is provided below.

12. Will my taking part in this study be kept confidential?

Yes. All the information about your participation in this study will be kept confidential. More details about this are included in Part 2.

13. Will I receive reimbursement for taking part in this research?

Yes. Participants who complete the study will receive £50 and reasonable travel expenses.

14. Who do I contact if I have problems?

If you wish to complain about any aspect of the way in which you have been approached or treated during this study, you should contact the investigators directly at 07444 054375 or nicholas.norwitz@dpag.ox.ac.uk. You may also contact the University of Oxford Clinical Trials and Research Governance (CTRG) office at 01865 572224 or the head of CTRG at ctrig@admin.ox.ac.uk.

Alternatively, you can contact Chief Investigator, Professor Michele Hu, at michele.hu@ndcn.ox.ac.uk.

The Patient Advisory Liaison Service (PALS) is a confidential NHS service that can provide you with support for any complaints or queries you may have regarding the care you receive as an NHS patient. PALS is unable to provide information about this research study.

If you wish to contact the PALS team, please contact:

PALS Office
Churchill Hospital
Old Road, Headington
Oxford OX3 7LE

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Tel: 01865 235855

Email: PALSCH@ouh.nhs.uk

TAS® Ltd, as Sponsor, has appropriate insurance in place in the unlikely event that you suffer any harm as a direct consequence of your participation in this study. NHS indemnity operates in respect of the clinical treatment which is provided.

This completes Part 1 of the Information Sheet.

If the information in Part 1 has interested you and you are considering participation, please continue to read the additional information in Part 2 before making any decision.

Part 2

More detailed information about how we will conduct of the study

1. What will happen if I don't want to carry on with the study?

You can withdraw from the study at any point.

2. Will my taking part in this study be kept confidential?

All the information is entirely confidential. None of the information stored on computers will be identifiable with your name. We will replace your name, initials, and date of birth with a participant number to make sure you remain anonymous.

Responsible members of the University of Oxford or Oxford Brookes University may be given access to data for monitoring and/or audit of the study to ensure that the research is complying with applicable regulations.

4. What will happen to the samples that I give?

The samples you provide will be kept secure and anonymised in freezers at Department of Physiology, Anatomy and Genetics of the University of Oxford.

5. Will any genetic tests be done?

No genetic tests will be performed as part of this study.

6. What will happen to the results of the research study?

At the end of the study, the results will be presented at regional, national, and international meetings and published in medical journals. All published results and information will be anonymised.

7. Who is organising and funding the research?

Research is organised by Department of Physiology, Anatomy and Genetics (DPAG) of the University of Oxford and is funded by a private international benefactor who made a donation to the study's sponsor, TAS® Ltd, for the expressed purpose of this research.

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8. Who has reviewed the study?

This study has been given a favourable ethical opinion for conduct in the NHS by South Central – Oxford A Research Ethics Committee.

This study is part of an educational project that will contribute towards doctoral degrees in Physiology, Anatomy, and Genetics for DPhil (PhD) candidates Nicholas Norwitz and Dr. Adrian Soto.



If you would like to be part of this study, or would like more information, please contact Nicholas Norwitz.

Email: nicholas.norwitz@dpag.ox.ac.uk

Mobile number: 07444 054375

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