

# Mulberry extract to modulate blood glucose in healthy adults

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| <b>Submission date</b><br>11/11/2014   | <b>Recruitment status</b><br>No longer recruiting              | <input type="checkbox"/> Prospectively registered<br><input checked="" type="checkbox"/> Protocol |
| <b>Registration date</b><br>21/04/2015 | <b>Overall study status</b><br>Completed                       | <input type="checkbox"/> Statistical analysis plan<br><input checked="" type="checkbox"/> Results |
| <b>Last Edited</b><br>17/05/2023       | <b>Condition category</b><br>Nutritional, Metabolic, Endocrine | <input checked="" type="checkbox"/> Individual participant data                                   |

## Plain English summary of protocol

### Background and study aims

Reducing the health impact of dietary sugar intake is a public health priority. Mulberry leaf extract may reduce blood glucose responses following dietary sugar intake by reducing absorption of carbohydrates in the gut. Mulberry leaf extracts are widely consumed in Asia. This study will test a water-extracted mulberry-leaf food supplement (currently available over the counter) in adults with normal (non-diabetic) blood sugar levels. The study will test the effect of a single administration of three doses of mulberry leaf extract capsules and a placebo (dummy) capsule when taken at the same time as a standard sugary drink.

### Who can participate?

32 healthy adults aged 18-65 with a BMI of 20-30.

### What does the study involve?

Participants will be recruited to attend for four visits, at least 48 hours apart, in order to test each of the mulberry and placebo capsules. The capsules will all have an identical appearance. Neither participants nor the study team will be aware of the order that the supplements are given until all of the tests have been completed. Blood glucose and insulin levels will be measured at time-points over 2 hours.

### What are the possible benefits and risks of participating?

Mulberry extract has an excellent safety profile, is widely consumed in Asia and is available over the counter in England. As far as we are aware, mulberry extract does not have any reported adverse reactions other than mild stomach symptoms such as wind and bloating. Participants will have a cannula/drip sited (small plastic tube in a vein) and there will be a risk of bruising and a small risk of inflammation/infection at the site. Local infection control/procedures will be followed when inserting the cannula.

### Where is the study run from?

The Southampton Wellcome Trust Clinical Research Facility (UK).

When is the study starting and how long is it expected to run for?

The study will commence in the first quarter of 2015 and we aim to run the study over 3-6 months until we have completed four visits for 32 participants.

Who is funding the study?

The study is being funded by the Technology Strategy Board as part of a nutrition for life Programme led by Phynova.

Who is the main contact?

Dr Mark Lown

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## Contact information

### Type(s)

Scientific

### Contact name

Prof Christopher Byrne

### Contact details

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## Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers

MULBERRY 1.1

## Study information

### Scientific Title

Mulberry extract to modULATE Blood glucosE Responses in noRmoglyCaemic adults (MULBERRY): a pilot study

**Acronym**

MULBERRY

**Study objectives**

An appropriate dose of mulberry extract co-administered with oral maltodextrin will reduce the incremental area under the curve for plasma glucose concentration over 120 minutes in normoglycaemic adults in a dose-dependent manner when compared to co-administration with placebo.

**Ethics approval required**

Old ethics approval format

**Ethics approval(s)**

Not provided at time of registration - submission pending

**Study design**

Single-centre double-blind randomised four-arm single-dose cross-over design to determine the efficacy, dose-response relationship and gastrointestinal side effects with respect to placebo

**Primary study design**

Interventional

**Secondary study design**

Randomised cross over trial

**Study setting(s)**

Other

**Study type(s)**

Treatment

**Participant information sheet**

Not available in web format, please use the contact details below to request a patient information sheet

**Health condition(s) or problem(s) studied**

Carbohydrate absorption

**Interventions**

The study will evaluate single doses (500 mg, 250 mg and 125 mg) of mulberry extract given at least 48 hours apart against placebo:

1. 500 mg mulberry extract (IminiNorm capsule) (equivalent to 25 mg deoxynojirimycin [DNJ])
2. 250 mg IminoNorm capsule (containing 12.5 mg DNJ)
3. 125 mg IminoNorm capsule (containing 6.75 mg DNJ)
4. Matched placebo capsule containing 500 mg microcrystalline cellulose

For co-administration with:

Maltodextrin 50 g dissolved in 150 ml water to be consumed within two minutes.

**Intervention Type**

Other

**Primary outcome measure**

Incremental area-under-the-curve (IAUC) for plasma glucose concentration over 120 minutes. The glucose and insulin values will be measured every 15 mins for two hours eg. 0, 15, 30, 45, 60, 75, 90, 105, 120 mins at each visit.

**Secondary outcome measures**

1. IAUC for plasma insulin concentration over 120 minutes
2. IAUC for plasma glucose and insulin concentration over 120 minutes
3. Plasma glucose concentration at the nine timepoints
4. Plasma insulin concentration at the nine timepoints
5. Gastrointestinal tolerability - abdominal bloating may be experienced due to reduced carbohydrate absorption. Gastrointestinal symptoms will be measured via questionnaire for 24 hours following each study visit

The glucose and insulin values will be measured every 15 mins for two hours eg. 0, 15, 30, 45, 60, 75, 90, 105, 120 mins at each visit.

**Overall study start date**

01/01/2014

**Completion date**

01/07/2014

**Eligibility****Key inclusion criteria**

1. Consent to study protocol
2. Age 18-65 years
3. BMI 20-30
4. Normal fasting glucose (fasting plasma glucose concentration  $\leq 7.0$  mmol/l)

**Participant type(s)**

Patient

**Age group**

Adult

**Lower age limit**

18 Years

**Upper age limit**

65 Years

**Sex**

Both

**Target number of participants**

## **Total final enrolment**

37

## **Key exclusion criteria**

1. Previous diagnosis of impaired fasting glucose or impaired glucose tolerance
2. Type I/II diabetes mellitus
3. BMI <20 or >30
4. Alcohol consumption in the previous 12 hours
5. Current oral hypoglycaemic medication use
6. Pregnancy or breastfeeding
7. Symptomatic irritable bowel syndrome
8. Current participation in another clinical trial
9. History of renal or liver disease
10. History of clotting or bleeding disorders
11. Taken antibiotics in the last 3 weeks prior to screening
12. Taking daily medications or dietary supplements that are not suitable for the study in the opinion of the principal investigator and/or that are prohibited (as per protocol)
13. Known intolerance or allergy to mulberry extract or any ingredients in the study products

## **Date of first enrolment**

01/01/2014

## **Date of final enrolment**

01/07/2014

## **Locations**

### **Countries of recruitment**

England

United Kingdom

### **Study participating centre**

**University of Southampton**

Southampton

United Kingdom

SO16 6YD

## **Sponsor information**

### **Organisation**

University Hospital Southampton NHS Foundation Trust (UK)

### **Sponsor details**

Tremona Rd  
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**Sponsor type**

Hospital/treatment centre

**Website**

<http://www.uhs.nhs.uk/>

**ROR**

<https://ror.org/0485axj58>

## Funder(s)

**Funder type**

Government

**Funder Name**

Technology Strategy Board Nutrition for Life (UK)

## Results and Publications

**Publication and dissemination plan**

We are aiming to publish the trial results, but not the protocol.

**Intention to publish date****Individual participant data (IPD) sharing plan****IPD sharing plan summary**

Not expected to be made available

**Study outputs**

| Output type                      | Details  | Date created | Date added | Peer reviewed? | Patient-facing? |
|----------------------------------|----------|--------------|------------|----------------|-----------------|
| <a href="#">Protocol article</a> | protocol | 28/10/2015   |            | Yes            | No              |
| <a href="#">Results article</a>  | results  | 22/02/2017   |            | Yes            | No              |
| <a href="#">Dataset</a>          |          | 22/02/2017   | 17/05/2023 | No             | No              |

