The effects of grape seed extract intake on health

Submission date 25/02/2022	Recruitment status No longer recruiting	[X] Prospectively registered [] Protocol
Registration date 03/03/2022	Overall study status Completed	 Statistical analysis plan Results
Last Edited 18/12/2023	Condition category Other	 Individual participant data

Plain English summary of protocol

Background and study aims

Grape seeds (Vitis vinifera) are a rich source of oligomeric proanthocyanidins (PAC), a class of polyphenols with potential health-promoting effects. However, these polyphenols are poorly absorbed and reach the large intestine where they are transformed by bacteria. These metabolic products could be responsible for the beneficial effects. The aims of this study are: i) to identify and quantify the main components/metabolites of grape seed in the urine of healthy volunteers; ii) to evaluate the activation of genes involved in the antioxidant and inflammatory response. The results will improve our understanding of the metabolism of PAC and the potential health effects of these components and their metabolic products on the antioxidant response.

Who can participate?

Healthy men and women aged 18-40 years with a normal weight (body mass index 18-25 kg/m²)

What does the study involve?

Participants will be randomly allocated to take two capsules per day of oligomeric proanthocyanidin or placebo (dummy capsules) for 7 days. Blood and urine samples will be collected at the start of the study and after 7 days. After a 1-week break, participants swap to the opposite capsules for 7 days and urine and blood samples are collected again. Body measurements and tests will be carried out at the start of the study.

What are the possible benefits and risks of participating?

Oligomeric proanthocyanidin (PAC) may be broken down and activate the body's defence mechanisms against oxidative stress and inflammation. There are no expected risks.

Where is the study run from?

1. Department of Pharmaceutical Sciences, DiSFARM- Università degli Studi di Milano (Italy) 2. Department of Food, Environmental and Nutritional Sciences, DeFENS-Università degli Studi di Milano (Italy)

When is the study starting and how long is it expected to run for? September 2021 to November 2022 Who is funding the study? Distillerie Bonollo S.p.A, Formigine (Italy)

Who is the main contact? 1. Prof. Giancarlo Aldini, Giancarlo.aldini@unimi.it 2. Dr Cristian Del Bo', cristian.delbo@unimi.it

Contact information

Type(s) Principal Investigator

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Additional identifiers

EudraCT/CTIS number Nil known

IRAS number

ClinicalTrials.gov number

Nil known

Secondary identifying numbers

Nil known

Study information

Scientific Title

Metabolic profile of a standardized extract of oligomeric procyanidins (PACs) from Vitis vinifera seeds in the urine and plasma of healthy volunteers and application of omic sciences for a better understanding of the biological action

Acronym

METAPAC

Study objectives

This pilot study aims to test the hypothesis that oligomeric procyanidins from a standardized Vitis vinifera seed extract are absorbed and metabolized, and can induce the activation of genes involved in the antioxidants and anti-inflammatory response.

Ethics approval required

Old ethics approval format

Ethics approval(s)

Approved 15/09/2021, the Ethics Committee of the University of Milan (Via Festa del Perdono 7, 20122, Milano, Italia; +39 (0)2 503.12667; comitato.etico@unimi.it), ref: 94/21

Study design Randomized controlled crossover intervention study

Primary study design Interventional

Secondary study design Randomised cross over trial

Study setting(s) Home

Study type(s) Prevention

Participant information sheet

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

Health condition(s) or problem(s) studied

Metabolism and biological activity of oligomeric procyanidins

Interventions

Ten healthy volunteers will be enrolled and randomized by block randomization to consume two capsules per day (one in the morning and one in the evening) of Vitis vinifera extract (300 mg oligomeric procyanidins) or placebo (dicalcium phosphate, cellulose, silicon dioxide, magnesium salts of fatty acids, titanium dioxide). Each treatment will be 7 days and separated by at least a 1-week wash-out period.

Intervention Type

Supplement

Primary outcome measure

Urinary excretion of oligomeric proanthocyanidin-derived human phenyl- γ -valerolactone metabolite from Vitis vinifera, measured using high-resolution mass spectrometry techniques at baseline and at 1, 2, 4, 6, 10, 12, 14, 24 and 48 hours after the intervention and reported as absolute urinary concentration (nmoles/ml)

Secondary outcome measures

1. Lipidomic, proteomic and metabolomic status measured by using omics approaches (e.g., proteomic, lipidomic, metabolomic) in the buffy coat at baseline, after 2 hours, and 7 days post-intervention. Values will be reported semi-quantitatively as fold-change.

2. Levels of DNA damage in the buffy coat measured by comet assay at baseline, after 2 hours and 7 days post intervention

3. Levels of 8-hydroxy-2'-deoxyguanosine (8-OHdG) in plasma and urine measured using ELISA kit at baseline, after 2 hours and 7 days post intervention

Overall study start date

15/09/2021

Completion date

30/11/2022

Eligibility

Key inclusion criteria

Women and men
 Aged 18-40 years
 BMI 18-25 kg/m²
 Healthy
 No smokers

Participant type(s)

Healthy volunteer

Age group Adult

Lower age limit 18 Years

Upper age limit

40 Years

Sex Both

Target number of participants 10

Total final enrolment

Key exclusion criteria

1. Smokers

- 2. Allergy to grape
- 3. Gastrointestinal disorder
- 4. Liver and renal disease
- 5. Antibiotic treatment
- 5. Use of supplements

Date of first enrolment 10/03/2022

Date of final enrolment 30/03/2022

Locations

Countries of recruitment Italy

Study participating centre University of Milan - DISFARM-DeFENS Via Luigi Mangiagalli 25 Milano Italy 20133

Sponsor information

Organisation University of Milan

Sponsor details Via Festa del Perdono, 7 Milano Italy 20122 +39 (0)2 5032 5032 unimi@postecert.it

Sponsor type University/education

Website https://www.unimi.it/it

ROR https://ror.org/00wjc7c48

Funder(s)

Funder type Industry

Funder Name

Distillerie Bonollo Umberto S.p.A

Results and Publications

Publication and dissemination plan

Planned publication of study results in high-impact peer-reviewed journals following trial completion. A protocol will be uploaded in the next few months.

Intention to publish date

01/05/2023

Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study are/will be available upon request from:

1. Prof. Giancarlo Aldini (giancarlo.aldini@unimi.it)

2. Dr Cristian Del Bo' (cristian.delbo@unimi.it)

Data are anonymous and consent was obtained from participants.

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<u>Results article</u>		07/12/2023	18/12/2023	Yes	No