ISRCTN39867491 https://doi.org/10.1186/ISRCTN39867491

The effects of grape seed extract intake on health

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

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

Contact name
Prof Giancarlo Aldini

ORCID ID
https://orcid.org/0000-0002-2355-6744

Contact details
University of Milan-Department of Pharmaceutical Sciences
Milano
Italy
20133
+39 (0)250319296
giancarlo.aldini@unimi.it

Type(s)
Scientific

Contact name
Dr Cristian Del Bo'

ORCID ID
https://orcid.org/0000-0001-7562-377X

Contact details
Via Luigi Mangiagalli 25
Milan
Italy
20133
+39 (0)250316730
cristian.delbo@unimi.it

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
1. Women and men
2. Aged 18-40 years
3. BMI 18-25 kg/m²
4. Healthy
5. 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
10

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?
Results article		07/12/2023	18/12/2023	Yes	No