

# The effects of grape seed extract intake on health

<b>Submission date</b> 25/02/2022	<b>Recruitment status</b> No longer recruiting	<input checked="" type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
<b>Registration date</b> 03/03/2022	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results
<b>Last Edited</b> 18/12/2023	<b>Condition category</b> Other	<input type="checkbox"/> 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/m<sup>2</sup>)

### 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](mailto:Giancarlo.aldini@unimi.it)  
2. Dr Cristian Del Bo', [cristian.delbo@unimi.it](mailto: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](mailto: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](mailto:cristian.delbo@unimi.it)

## Additional identifiers

## 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

## Study type(s)

Prevention

## 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(s)

Urinary excretion of oligomeric proanthocyanidin-derived human phenyl- $\gamma$ -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)

## Key secondary outcome(s)

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

**Completion date**

30/11/2022

## Eligibility

**Key inclusion criteria**

1. Women and men
2. Aged 18-40 years
3. BMI 18-25 kg/m<sup>2</sup>
4. Healthy
5. No smokers

**Participant type(s)**

Healthy volunteer

**Healthy volunteers allowed**

No

**Age group**

Adult

**Lower age limit**

18 years

**Upper age limit**

40 years

**Sex**

All

**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

**ROR**

<https://ror.org/00wjc7c48>

## Funder(s)

**Funder type**

Industry

**Funder Name**

Distillerie Bonollo Umberto S.p.A

## Results and Publications

**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](mailto:giancarlo.aldini@unimi.it))
2. Dr Cristian Del Bo' ([cristian.delbo@unimi.it](mailto: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?
<a href="#">Results article</a>		07/12/2023	18/12/2023	Yes	No