

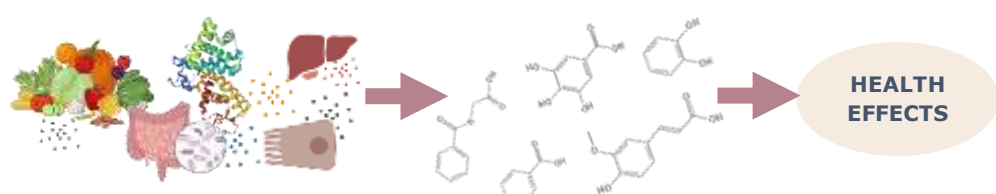
# INVESTIGATION OF ENDOGENOUS AND/OR EXOGENOUS PHENOLIC METABOLITES IN HUMANS USING (UN)TARGETED METABOLOMICS - ENDOPHENOL

**Laila Zeraik** (laila.guimaraeszeraikcardoso@unipr.it)  
**Tutors: Prof. Letizia Bresciani, Prof. Pedro Mena.**

Dept. of Food and Drugs, University  
of Parma, Parma, Italy

## INTRODUCTION

After ingestion, (poly)phenols are transformed into several smaller **catabolites** called **low-molecular-weight phenolics (LMWP)** that are likely responsible for their reported health effects. LMWP can also be present after a well-controlled (poly)phenol-free diet, possibly coming from the **metabolism of amino acids and catecholamines**. The actual contribution of these sources to the pool of bioavailable LMWP is poorly known.



**Figure 1.** Possible LMPW sources (BioRender.com)

## MATERIALS AND METHODS

A randomized crossover **trial** was conducted in Parma (IT), where 27 volunteers followed a **standardized** and **controlled in energy very-low-(poly)phenol diet** for 4.5 days, with intake of **decaffeinated coffee (DC)** - known source of LMWP - or control on day 3. Anthropometric data and biological samples were collected at selected time points. Phenolics in DC were analysed using an ultra-high performance liquid chromatography (UHPLC) Acquity UHPLC I-Class Plus system (Waters, Milford, MA, USA) coupled to a Xevo TQ XS mass spectrometer. Data processing was performed with TargetLynx Software. Quantification was carried out with pure reference standards or the most similar compound.

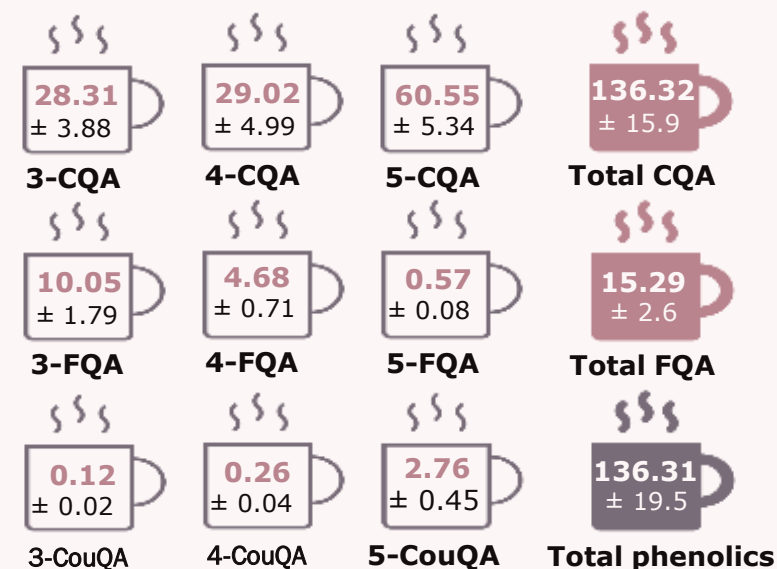
## FIRST RESULTS

**Table 1** Description of the Endophenol study population

| Variable                 | All (n=27)     | Male (n=12)           | Female (n=15)        |
|--------------------------|----------------|-----------------------|----------------------|
| Age (years)              | 29.1 ± 4.4     | 30.1 ± 5.2            | 28.3 ± 3.7           |
| Body weight (kg)         | 62.9 ± 10.7    | <b>71.1 ± 9.3</b>     | <b>55.8 ± 5.1</b>    |
| BMI (kg/m <sup>2</sup> ) | 22.1 ± 2.8     | <b>23.7 ± 3.1</b>     | <b>20.9 ± 1.7</b>    |
| Waist circumference (cm) | 74.1 ± 9.5     | <b>82.1 ± 8.2</b>     | <b>67.7 ± 3.9</b>    |
| Hip circumference (cm)   | 95.6 ± 5.07    | 95.2 ± 6.0            | 95.9 ± 4.4           |
| Waist/hip ratio          | 0.87 ± 0.1     | <b>0.9 ± 0.1</b>      | <b>0.7 ± 0.0</b>     |
| Basal metabolism (kcal)  | 1470.4 ± 264.5 | <b>1713.0 ± 202.8</b> | <b>1276.3 ± 82.5</b> |
| Fat mass (%)             | 22.3 ± 5.8     | 18.6 ± 5.3            | 24.9 ± 4.8           |
| Bone mass (%)            | 3.9 ± 0.3      | <b>4.1 ± 0.3</b>      | <b>3.8 ± 0.2</b>     |
| TBW (%)                  | 55.4 ± 4.5     | <b>58.9 ± 3.1</b>     | <b>52.7 ± 3.3</b>    |
| Protein (%)              | 18.5 ± 3.1     | 18.5 ± 3.2            | 18.6 ± 3.2           |

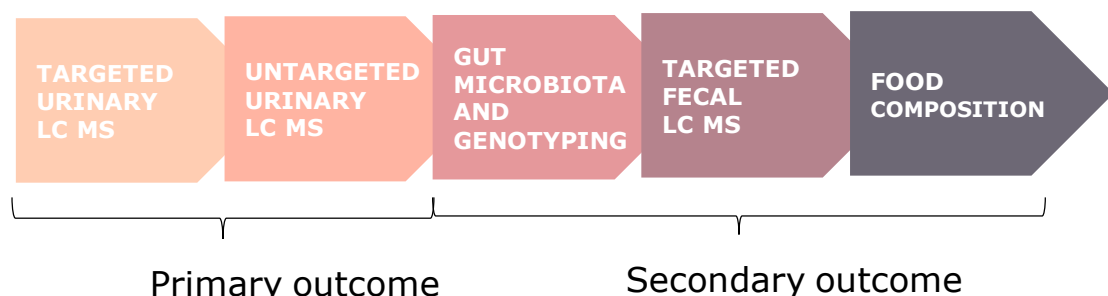
BMI: body mass index, TBW: total body water. Values are expressed as mean ± standard deviation. Values in bold are statistically different (Independent t-test, SPSS)

## Main phenolics found in DC (mg/serving)



CQA: Caffeoylquinic acid. FQA: Feruloylquinic acid. CouQA: Coumaroylquinic acid.

## NEXT STEPS



The main **objectives** of ENDOPHENOL are reporting the **presence** and **source** of bioavailable **LMWP** (primary outcome), meaning potential "new sources" of LMWP might need to be considered in future studies; and investigating the ability of specific (non)nutrients and individual characteristics to influence the ratio of metabolites derived from the accounted sources.

## REFERENCES

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## ACKNOWLEDGMENTS



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