Uni ct AGRICOLTURA, ALIMENTAZIONE E AMBIENTE

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# Health implication of the phenolic compounds: Targeting hallmarks of colon cancer through phenolic colon microbiota interplay (PREVENT-DIET)

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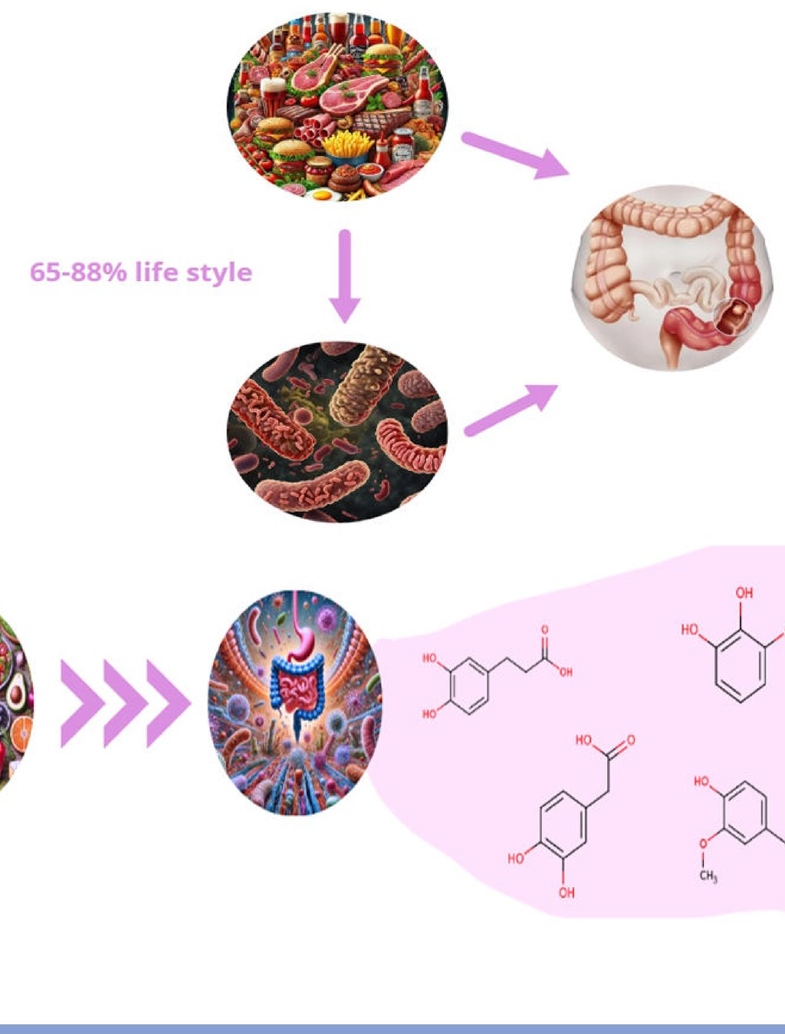
## STATE OF THE ART

Colorectal cancer (CRC) is the second cause of mortality in the European countries. Diet plays a crucial role in the development of CRC. Dietary phenolic compounds have the ability to inhibit colon cancer cells proliferation. In addition, phenolic compounds were able to modulate gut microbiota composition. In particular, the metabolites produced by intestinal microbiota during metabolism of phenolic compounds are to be considered the real active compounds.



## OBJECTIVES AND MILESTONES

- Selection of vegetable foods rich in different subclasses of phenolic compounds
- *In vitro* gastro-intestinal digestion of previously selected vegetable foods
- Colonic fermentation and analysis of the shift in microbiota composition induced by phenolic compounds
- Determination of the gut microbiota metabolism of phenolic compounds by metabolomics
- Testing on 2D/3D colon cancer cells the metabolites produced during colon fermentation

## GANTT DIAGRAM OF THE PROJECT

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
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| **Selection of the vegetable foods** | | | | | | | | | | | | | | | | | | | | | | | | |
| 1) Extraction of phenolic compounds | | | | | | | | | | | | | | | | | | | | | | | | |
| 2) Metabolomics | | | | | | | | | | | | | | | | | | | | | | | | |
| **Determination of gastro-intestinal stability** | | | | | | | | | | | | | | | | | | | | | | | | |
| 1) *In vitro* digestion | | | | | | | | | | | | | | | | | | | | | | | | |
| 2) Metabolomics | | | | | | | | | | | | | | | | | | | | | | | | |
| **Colonic fermentation of phenolic compounds** | | | | | | | | | | | | | | | | | | | | | | | | |
| 1) Metabolomics on fermented product | | | | | | | | | | | | | | | | | | | | | | | | |
| **Anti-tumoral activity of phenolic compounds and metabolites** | | | | | | | | | | | | | | | | | | | | | | | | |
| 1)Test on colon cancer cells culture the metabolites and phenolic compounds | | | | | | | | | | | | | | | | | | | | | | | | |
| **Thesis and Paper Preparation** | | | | | | | | | | | | | | | | | | | | | | | | |