



## Polyphenols fate and impact on gut microbiota of Pomegranate Juice in Simulated Digestion Model SHIME®

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Human health and diseases are increasingly linked to the human microbiota condition. The gut microbiota plays an important role by contributing to the fermentation and release of nutritional food components, eliciting the immune system response, protecting from pathogenic agents, and synthesizing important vitamins.

Diet also impacts the intestinal microbiota, and particularly on its taxonomical composition and metabolism. The dietary polyphenols, microelements present in vegetables and fruits, provide a wide spectrum of biological responses with beneficial effects for human health. Polyphenols ingested with the diet are poorly absorbed in the stomach and small intestine. Up to 90–95% of total polyphenol intake reaches the colon and is metabolized by gut microbiota into several bioactive compounds that can both modify intestinal ecology and have beneficial health effects. Pomegranate juice is very rich in polyphenols (over 2 g/L juice) and anthocyanins (3-glucosides and 3,5-glucosides of cyanidin, pelargonidin and delphinidin), flavonols and ellagittannins (punicalagin) are the main identified compounds.

In this study, the *ex-vivo* Simulator of Human Intestinal Microbial Ecosystem - SHIME® was used to investigate the effects of a daily administration (for 1 week) of pomegranate juice on human gut microbiota and the fate of pomegranate polyphenols along the simulated digestion process.

The chemical analysis highlighted a polyphenols bioaccessibility ranging from 15 to 30% for anthocyanins and from 10 to 18% for ellagic acid and flavonoids. This trend was slightly lower than the bioaccessibility of polyphenols already reported in other food matrices (artichokes, olives), although for juice administration this trend could be linked to the absence of matrix protection. The analysis of microbiota showed that a daily administration of pomegranate juice is able to positively modulate the gut microbiota. Further analyses are underway to deeply investigate these preliminary results.

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