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# INNOVATIVE PROCESSES FOR NATURAL ACTIVE INGREDIENTS EXTRACTION AND THEIR ONLINE FUNCTIONALIZATION USING FLOW CHEMISTRY TECHNOLOGY

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Natural products extracted from biomass are an abundant source of bioactive compounds with high potential for therapeutic or cosmetic applications. Flavonoids compounds, for example, are frequently found in fruits, plants or wood, and offer antioxidant, anti-tumorous, anti-inflammatory or anti-allergic effect<sup>[1]</sup>. Yet, flavonoids often suffer from their lack of stability or solubility to be properly valued as active ingredients<sup>[2]</sup>. To overcome those limitations and offer environment-friendly industrial applications, flow chemistry has risen as a green technology for innovative process alternatives. Its many advantages provide more efficient and reliable reactions, and facilitate coupling to further functionalization or online analysis<sup>[3]</sup>.

In this context, our interest has been focused on the development of an integrated process including biomass flow extraction of natural ingredients and their online derivatization in order to enhance their properties.

We implemented the online extraction and functionalization of *Robinia Pseudoacacia* wood, an abundant tree which embodies a valuable biomass source of flavonoids. After optimization, the continuous extraction cell was coupled to various types of structural modification, including mild-condition and selective enzymatic pathways. Innovative new ingredients have been produced from this modular online system, embedded in a responsible and industrializable approach.

This work provides a transferrable methodology of online extraction/structural modification to other biomass and extractible bioactive molecules.

## References

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