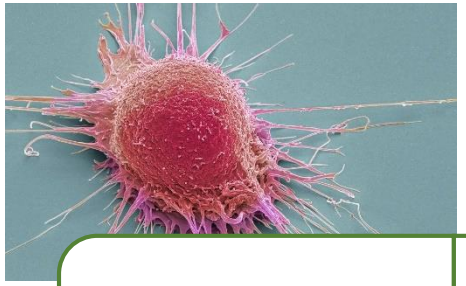
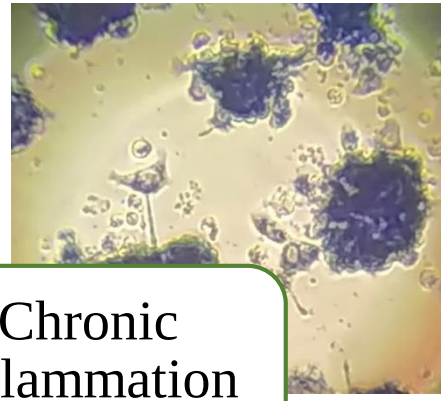
Increased stability of Bimi® glucosinolates by bioencapsulation

Paula Garcia-Ibañez, Diego A Moreno and Micaela Carvajal

Introduction





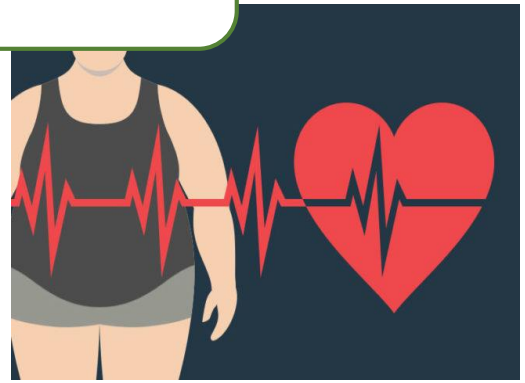
Cancer

Chronic inflammation

Non-comunicable diseases

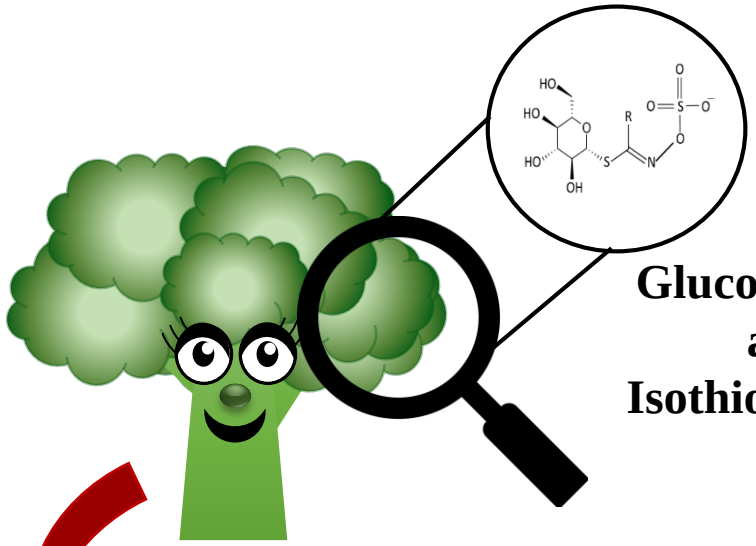
Diabetes

Obesity



Bioactive-enriched foods and functional ingredients emerge as coadjuvants in diets

Introduction



Glucosinolates and Isothiocyanates

- **Phase II detoxification enzymes inducers**
- **Anti-tumorigenic activity**
- **Nrf2 transcriptor factor inductor**
- **Gut microbiome modulators**

Mitsiogianni et al. 2019, *Antioxidants.*
Kaczmarek et al. 2019, *The Journal of nutritional biochemistry*

Brassica oleracea L. var. *italica*

Brassica oleracea L. var. *alboglabra*

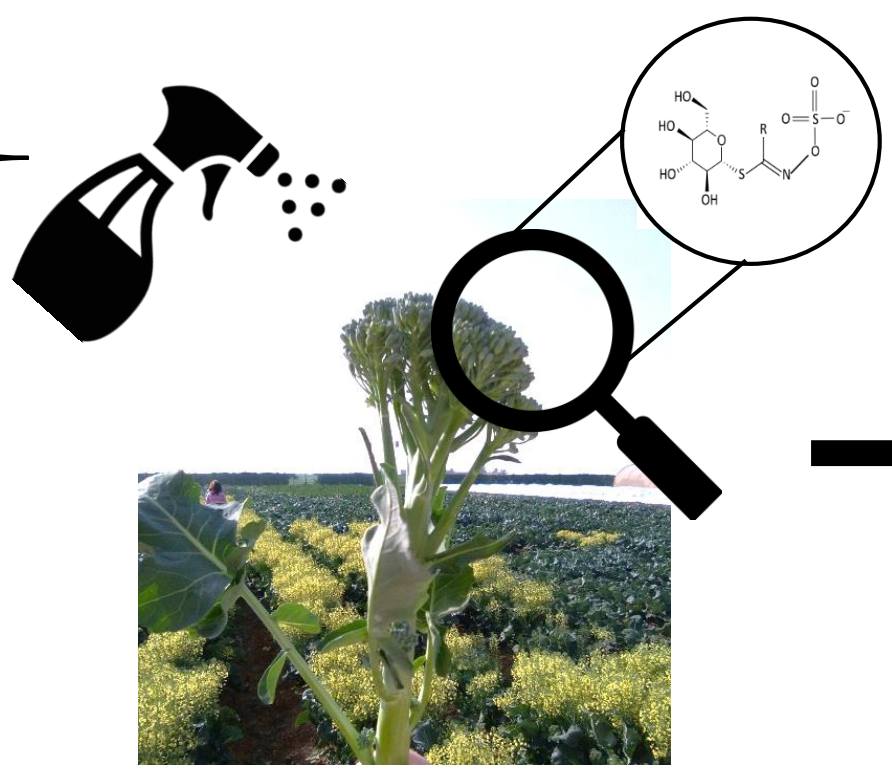
Bimi ®

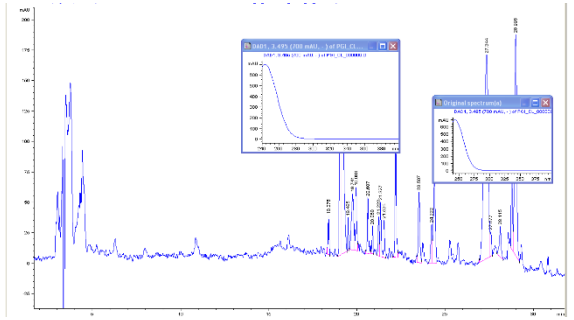
Material

-200 µM SA

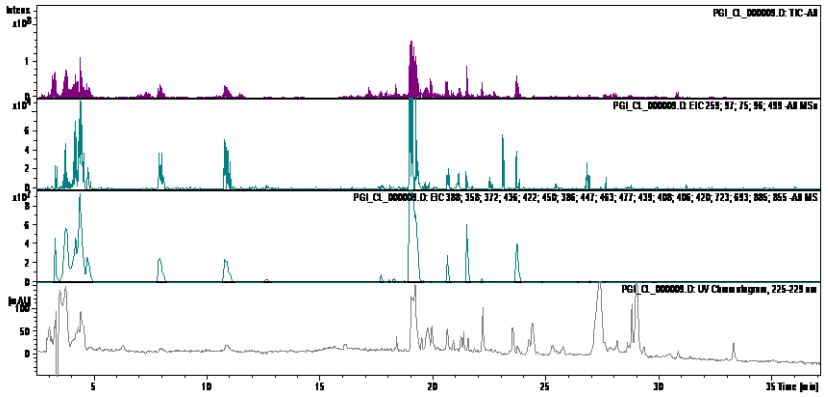
-100 µM MeJA

-SA+MeJA





HPLC-DAD-ESI-Msn analysis

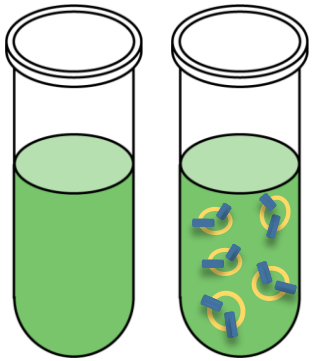


Material

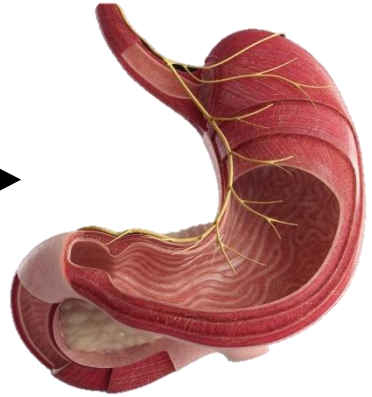
Bimi® edible part elicitated with the combination treatment

Bimi® leaves elicitated with 100 µM MeJA

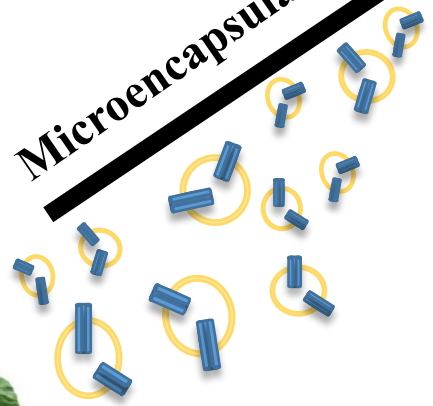
SFN-rich extract elaboration



Gastric *in vitro* digestion (3h)



Microencapsulation



Cauliflower plasma membrane vesicles extraction

UHPLC-QqQ- MS/MS

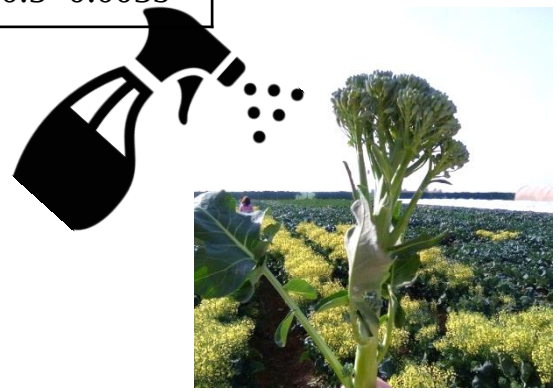
Metabolite analysis

Results and Discussion

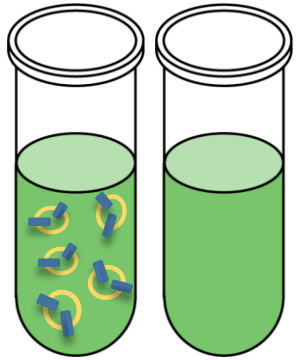
mg g D.W.$^{-1}$	Edible part				Leaves			
GLS	Control	200 µM SA	100 µM MeJA	SA+MeJA	Control	200 µM SA	100 µM MeJA	SA+MeJA
GRA	4.06±0.12a	3.95±0.06b	4.13±0.08a	3.98±0.04b	1.4±0.04ab	1.67±0.07a	1.10±0.07b	1.52±0.01ab
HGB	*	1.76±0.19a	1.56±0.21a	1.27±0.05a	*	*	*	*
GB	0.94±0.04d	3.73±0.14c	4.79±0.1b	5.63±0.07a	0.72±0.03c	0.75±0.12c	3.9±0.04a	2.26±0.09b
MGB	1.72±0.08b	2.2±0.11a	1.8±0.05b	2.35±0.08a	*	*	1±0.01a	0.71±0.07b
NGB	0.74±0.05c	0.18±0.04d	2.44±0.1b	3.01±0.16a	*	0.19±0.02c	1.63±0.03a	0.5±0.003b

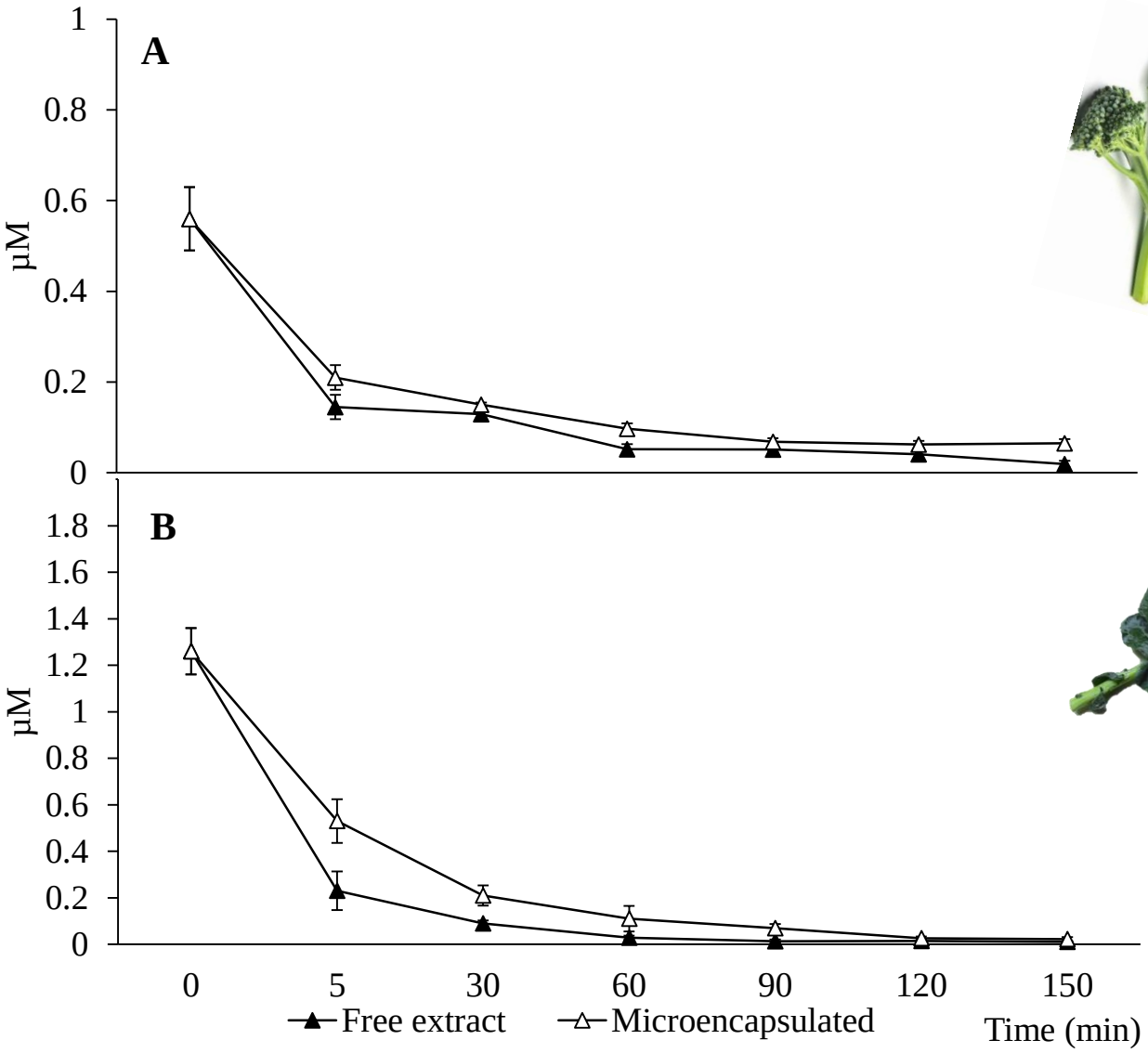
*The presence of the GLSs was under limit of quantification by HPLC-DAD-ESI-MSn (< 0.02 mg/ g D.W.).

SA: salicylic acid, MeJA: methyl jasmonate, GLS: glucosinolate, GRA: glucoraphanin, HGB: 4-hydroxy-glucobrassicin, GB: glucobrassicin, MGB: 4-metoxy-glucobrassicin; NGB: neoglucobrassicin



Results and discussion



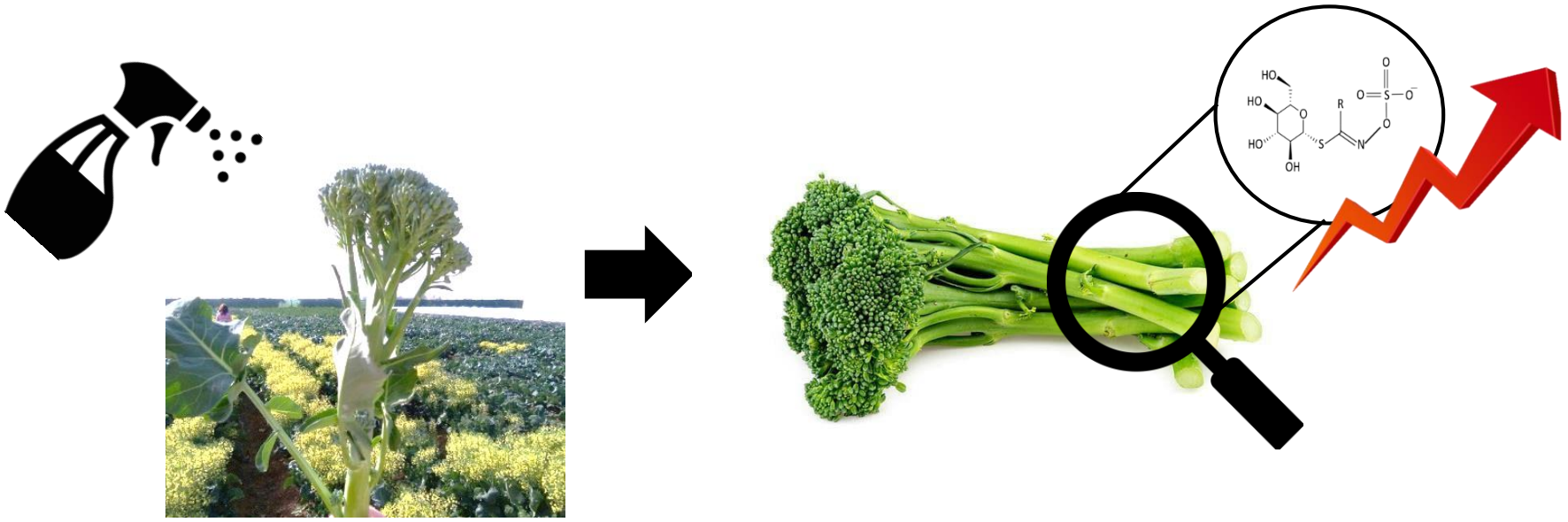


Bimi® edible part

Bimi® leaves

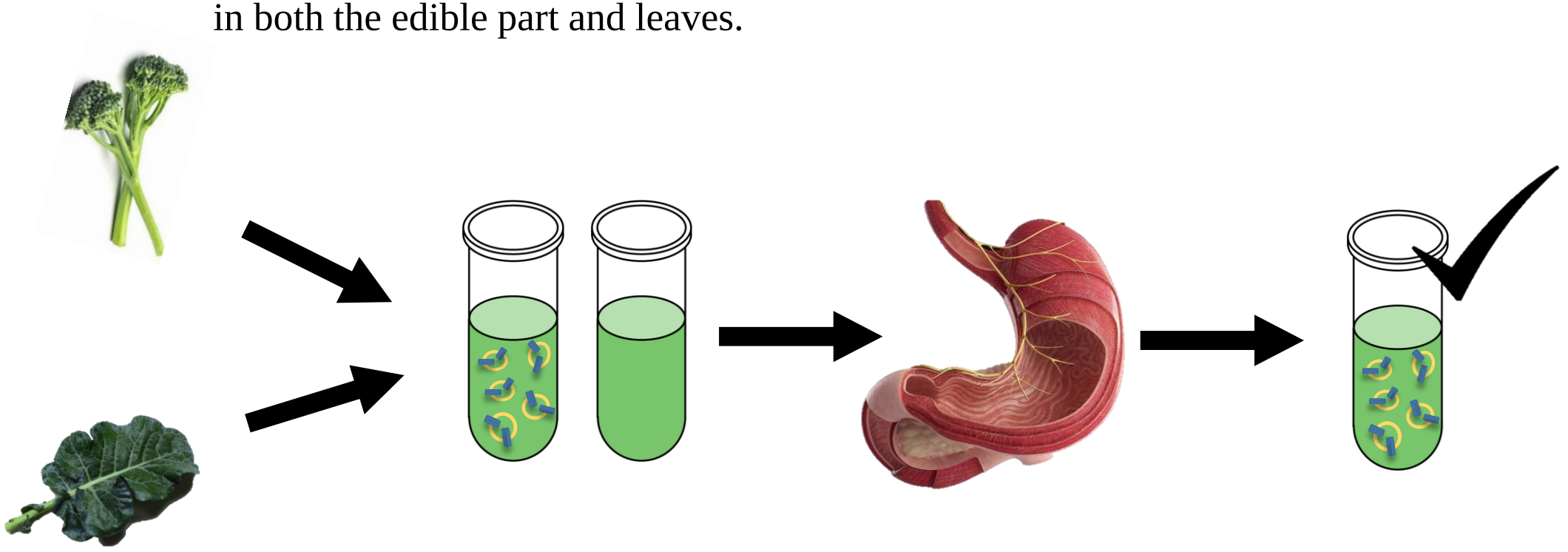
Conclusion

- Elicitors (200 µM SA, 100 µM MeJA and their combination) favored an enrichments of glucosinolates in the edible part of Bimi® and their leaves.



Conclusion

- When Bimi® plant material was used for a SFN-rich extract for an *in vitro* gastric digestion, higher concentrations of SFN were found in the microencapsulated samples, in both the edible part and leaves.



Acknowledgements

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