



HAL
open science

Apoptotic agents from the endolichenic fungi against chemoresistant cancers

H Makhloufi, A Pinon, L Gibot-Leclerc, Y Champavier, E Pinault, M Millot,
G Chemin, L Mambu

► **To cite this version:**

H Makhloufi, A Pinon, L Gibot-Leclerc, Y Champavier, E Pinault, et al.. Apoptotic agents from the endolichenic fungi against chemoresistant cancers. International congress on natural product research, Jul 2024, CRACOVIE, Poland. hal-04674366

HAL Id: hal-04674366

<https://hal.science/hal-04674366v1>

Submitted on 26 Aug 2024

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Apoptotic agents from the endolichenic fungi against chemoresistant cancers

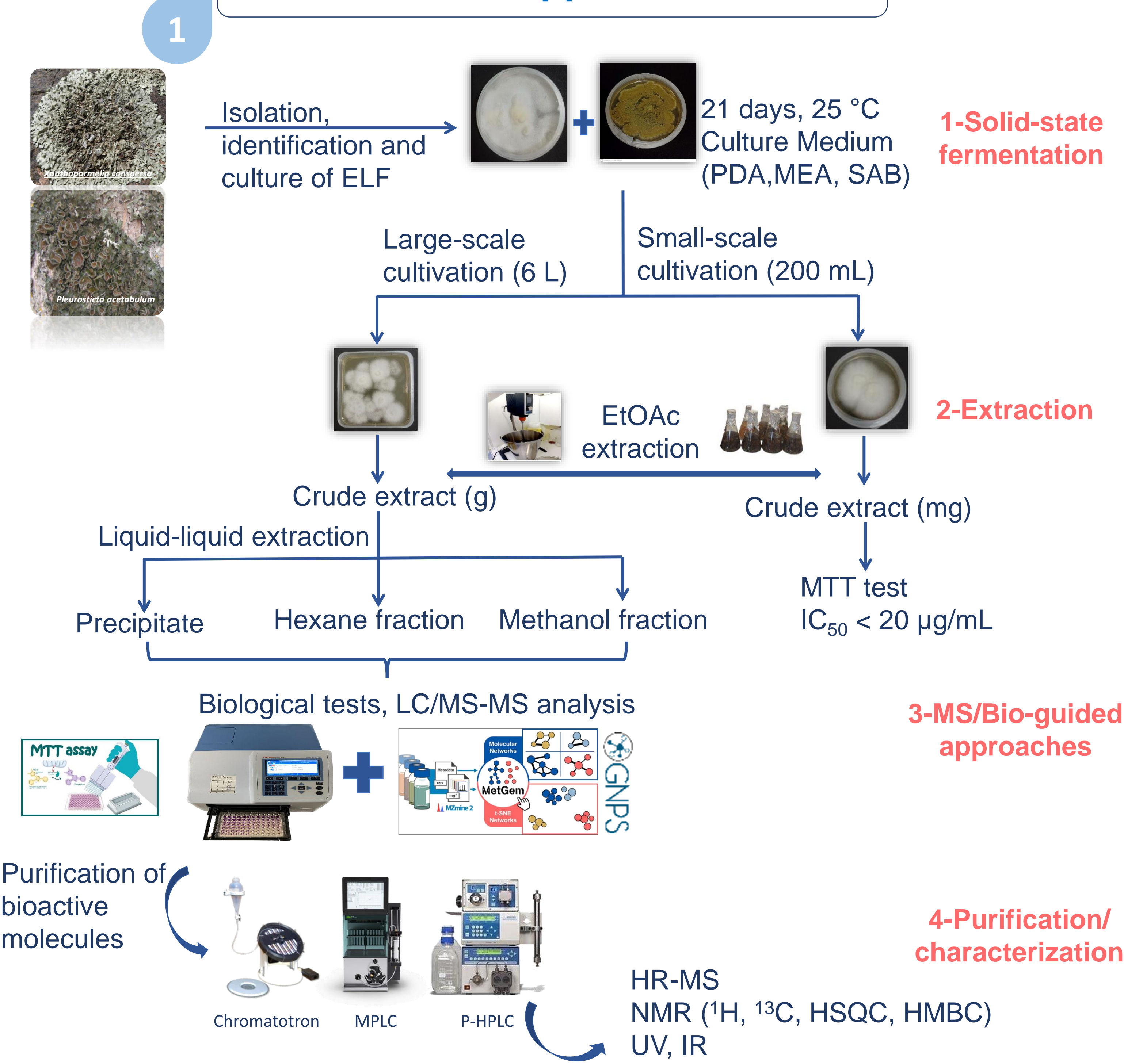
H. Makhloufi, A. Pinon, L. Gibot-Leclerc, Y. Champavier, E. Pinault, M. Millot, G. Chemin, L. Mambu, Univ. Limoges, LABCiS, UR 22722 ; BISCEm, UAR 2015 US42, F-87000 Limoges, France.

Introduction

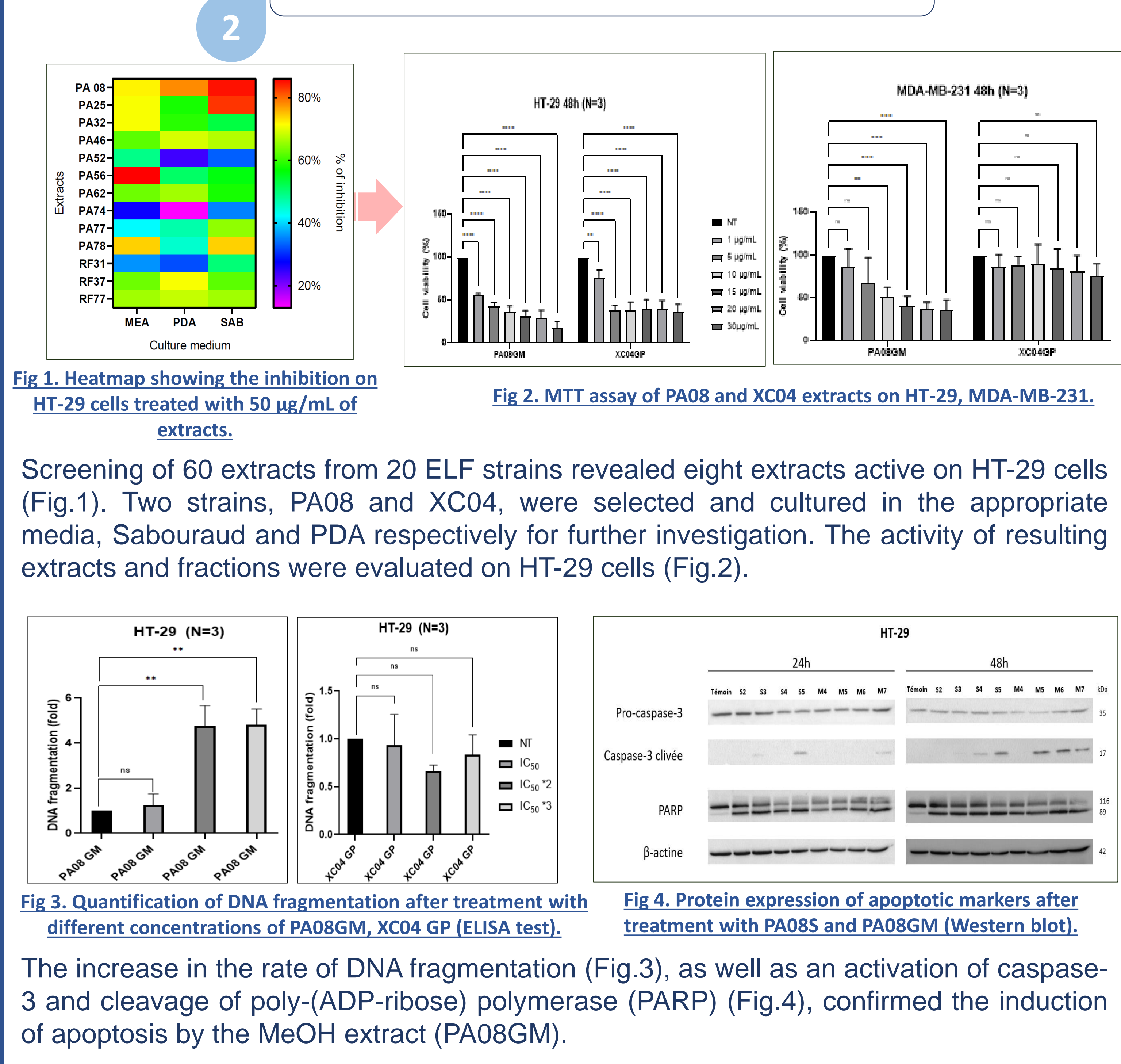
Cancer is a major cause of death worldwide, with breast, lung and colon cancers being the most common. Chemoresistance is also a major obstacle in the treatment of cancer. Hence the importance of researching new treatments to diversify the therapeutic arsenal. Endolichenic fungi (ELF), non-pathogenic fungi located in the thallus of lichens, represent a niche for molecules with diverse biological activities, including antiproliferative activity^{1,2,3}. This work is focused on the search for new bioactive compounds against colorectal cancer (HT-29) and triple-negative breast cancer (MDA-MB-231).

Methods and results

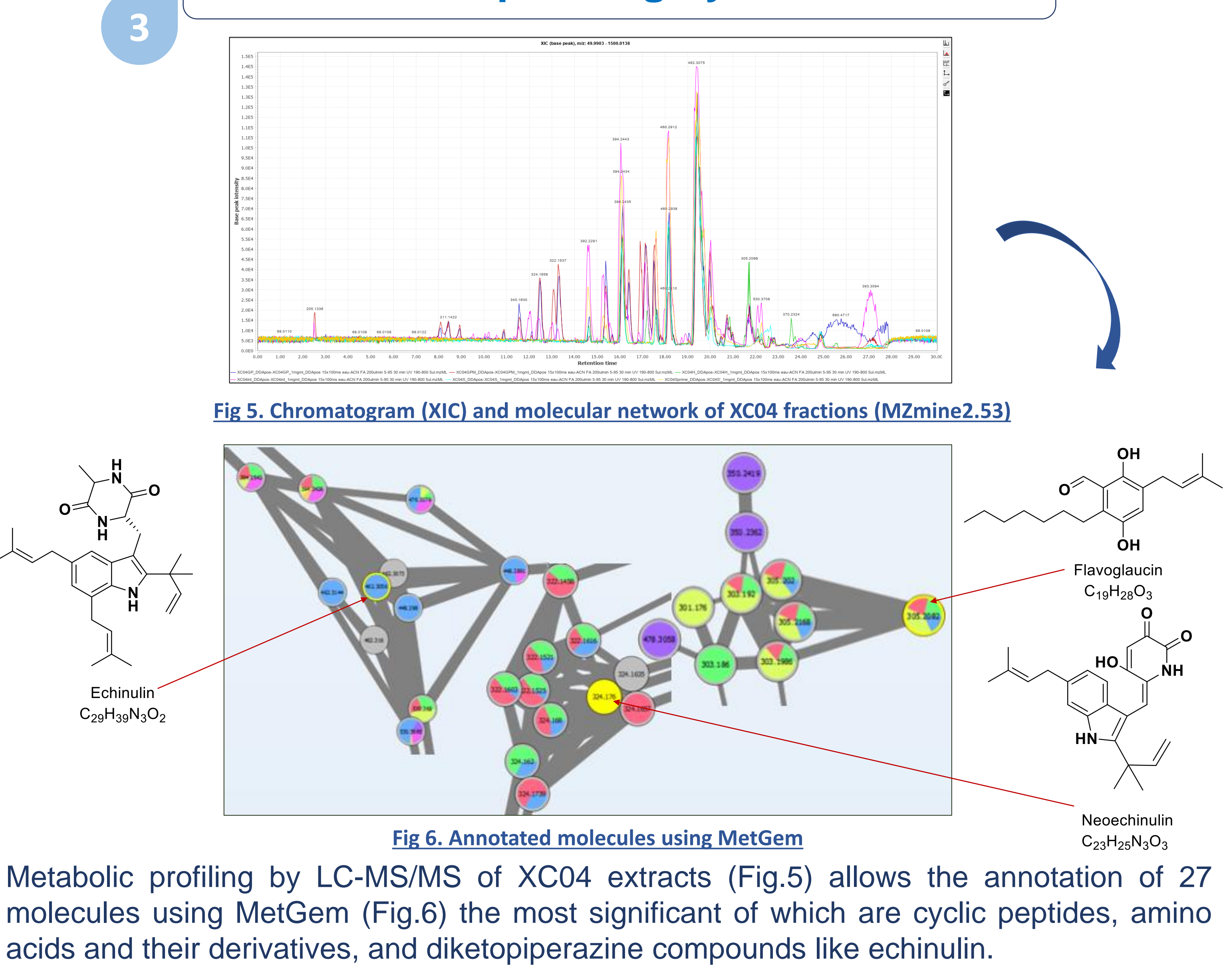
Work approach



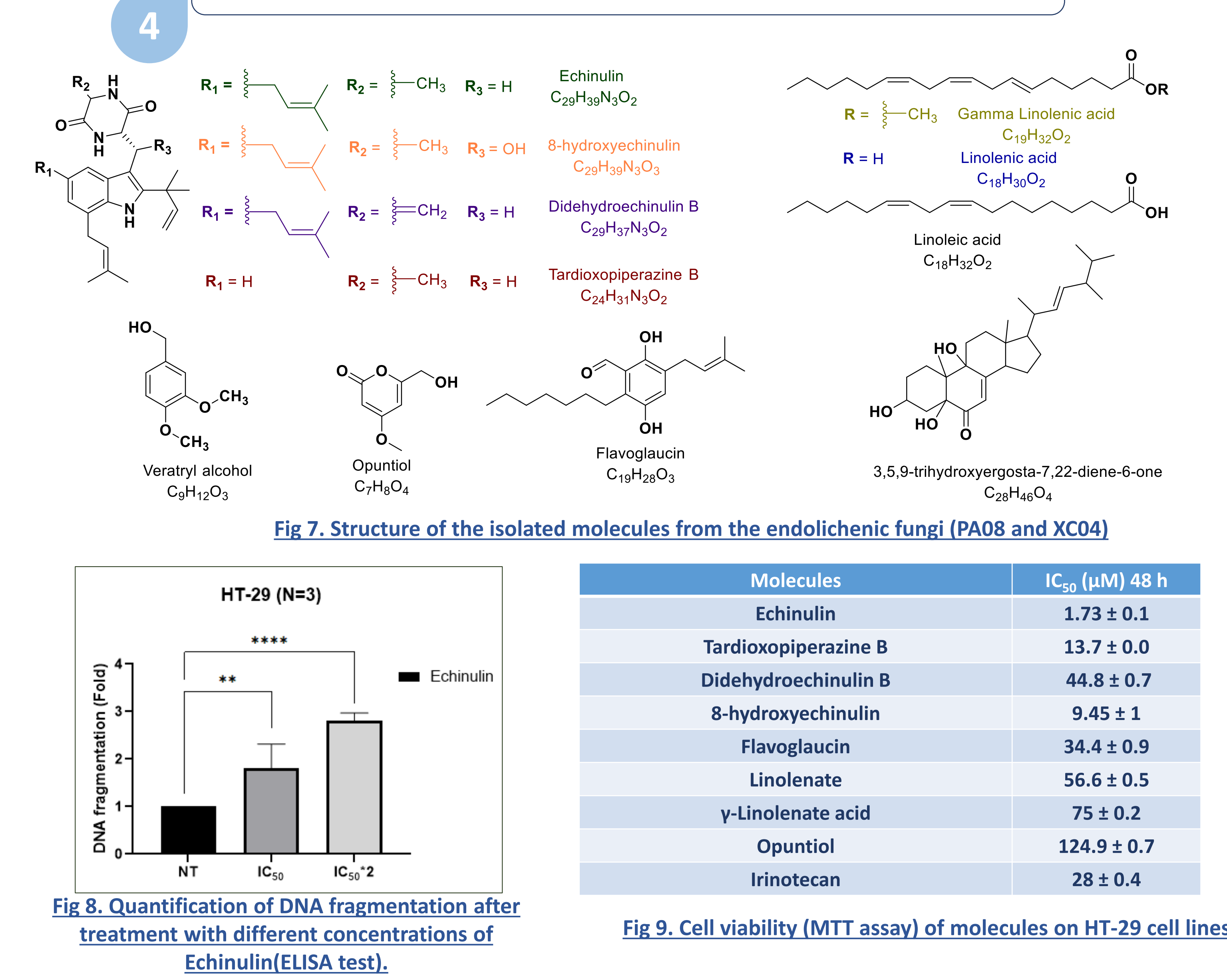
Cell viability / Study of apoptosis



Metabolic profiling by LC/MS-MS



Isolated molecules



Conclusion

The antiproliferative activity of the PA08GSM and XC04 GP extract was evaluated on HT-29 and MDA-MB-231 cell lines, where the involvement of PA08 GM is clear in the induction of an apoptotic process on HT-29 cells. Furthermore, the XC04 extracts' LC/MS-MS analysis enables the identification of specific compounds, their purification, and subsequently the assessment of their biological activity on HT-29 cell lines. Here, we report on the separation of 4 known compounds from the endolichenic fungus XC04 and 5 known molecules from the endolichenic fungus PA08 for the first time, with echinulin as the most active with an induction of the apoptotic process on HT-29 cell lines. This study demonstrates that endolichenic fungi are a fascinating source of molecules with therapeutic potential.

References
¹Kellogg *et al.*, «Endolichenic fungi: new source of rich bioactive secondary metabolites on the horizon », *Phytochem Rev*, 2017, (16), 271-293.
²Lagarde *et al.*, « Antiproliferative and antibiofilm potentials of endolichenic fungi associated with the lichen *Nephroma laevigatum* », *J. Appl. Micro*, 2019 (126) 1044-1058.
³Li *et al.*, « Tetramic Acids and pyridone alkaloids from the endolichenic fungus *Tolypocladium cylindrosporium* », *J. Nat. Prod*, 2015, (9), 2155-2160.
⁴Prosperini *et al.* « A review of the mycotoxin enniatin B », *Front.Public.Health*, 2017, (3), 304 .
⁵Park *et al.* « Phytosphingosine induces apoptotic cell death via caspase 8 activation and bax translocation in human cancer cells », *Clin. Cancer.Res*, 2003, (9), 878-885.

