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RESEARCH AREA

Naturally derived compounds continue to play an important role in modern drug discovery, as their remarkable structural diversity and often complex, unique structures can give rise to biological effects that are difficult to predict through synthetic routes. The study of natural products therefore not only enables the discovery of new active drugs but also contributes to a better understanding of already established therapeutic targets. Our research focuses on carefully and rationally selected promising plant species, identified through literature search, traditional medicinal knowledge, preliminary screening assays, and advanced metabolomic analyses. From extracts demonstrating biological activity, constituents are isolated using different chromatographic techniques, and each purification step is monitored by pharmacological testing. The structures of the compounds are elucidated by spectroscopic methods (NMR and MS). Detailed evaluation of biological activity is carried out in collaborations.

TECHNIQUES AVAILABLE IN THE LAB

Extraction and preparation of plant samples; separation techniques used in phytochemistry; chromatographic methods including analytical and preparative HPLC, flash chromatography, rotational planar chromatography (RPC), thin-layer chromatography (TLC), and column chromatography (OCC, VLC, GC); structure elucidation by spectroscopic methods (NMR, MS, UV–VIS); use of a microplate reader; antiproliferative and antimicrobial activity assays carried out in collaboration.

SELECTED PUBLICATIONS

Barta, A., Kincses, A., Purger, D., Spengler, G., Hohmann, J., **Vasas, A.** (2025) Phenanthrene monomers and dimers from Juncus tenuis with antiproliferative activity and synergistic effect with doxorubicin against human colon cancer cell lines. **Int J Mol Sci 26:** 7665.

Stefkó, D., Kúsz, N., Szemerédi, N., Barta, A., Spengler, G., Berkecz, R., Hohmann, J., **Vasas, A.** (2022) Unique phenanthrenes from Juncus ensifolius and their anti-proliferative and synergistic effects with the conventional anticancer agent doxorubicin against human cancer cell lines. **Pharmaceutics 14:** 608.

Vasas, A., Lajter, I., Kúsz, N., Király, B. S., Kovács, T., Kurtán, T., Bózsity, N., Nagy, N., Schelz, Z., Zupkó, I., Krupitza, G., Frisch, R., Mándi, A., Hohmann J. (2021) Isolation, structure determination of sesquiterpenes from Neurolaena lobata and their antiproliferative, cell cycle arrest-inducing and anti-invasive properties against human cervical tumor cells. **Pharmaceutics 13:** 2088.

Hammadi, R., Kúsz, N., Dávid, C. Z., Behány, Z., Papp, L., Kemény, L., Hohmann, J., Lakatos, L., **Vasas, A.** (2021) Ingol and ingenol-type diterpenes from Euphorbia trigona Miller with keratinocyte inhibitory activity. Plants 10: 1206.

Vasas, A., Hohmann, J. (2014) Euphorbia diterpenes: Isolation, structure, biological activity, and synthesis (2008–2012). **Chem Rev 114:** 8579–8612.