

Technical University of Denmark



Explorative Solid-Phase Extraction for Accelerated Natural Products Discovery and Purification

Abstract of poster presentation

Månsson, Maria; Nielsen, Kristian Fog; Gram, Lone; Larsen, Thomas Ostenfeld

Publication date:
2009

Document Version
Early version, also known as pre-print

[Link back to DTU Orbit](#)

Citation (APA):

Johansen, M., Nielsen, K. F., Gram, L., & Larsen, T. O. (2009). Explorative Solid-Phase Extraction for Accelerated Natural Products Discovery and Purification: Abstract of poster presentation. Abstract from 6th European Conference on Marine Natural Products, Porto (PT), 19-23 Jul, .

DTU Library

Technical Information Center of Denmark

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

(Poster)

Explorative Solid-Phase Extraction for Accelerated Natural Products Discovery and Purification

Maria Johansen¹, Kristian Fog Nielsen², Lone Gram³, Thomas Ostenfeld Larsen⁴

¹maj@bio.dtu.dk; ²kfn@bio.dtu.dk; ³gram@aqua.dtu.dk; ⁴tol@bio.dtu.dk

When purifying a natural product, the more specific information available on the target compound prior to purification, the more effective the purification (1,2). If no prior knowledge about the target compound(s) is available (e.g. from dereplication), a purification strategy is normally developed on the go or by standard fractionation methods. However, for extracts containing mainly unknown compounds, or when targeting bioactive compounds this lack of strategy beforehand can result in poor recoveries and, at worst, a permanent loss of activity in the extract.

Therefore, we at Centre for Microbial Biotechnology have developed a so called Explorative Solid-Phase Extraction (E-SPE) kit consisting of a set of different SPE columns with orthogonal selectivities, which in a fast and easy way will indicate the optimum purification strategy on a small scale in the exploratory stage of the discovery process before moving on to a semi-preparative or preparative scale. This will allow a more rational approach to the purification process. When linked to a bioassay system, E-SPE can potentially reveal information about the active compound that can help the ensuing purification, for example by suggesting a purification step that removes the main part of inactive extract components or a step that selectively captures the active compound. By using different types of stationary phases, the different functionalities of the molecules can be exploited to obtain pure compounds in the fewest possible chromatographic steps. When using an elution matrix (3) for visualisation of the bioactivity, the extract can be easily evaluated.

The method has been validated (in triplica) on 25 different marine bacteria with antibacterial effects, such as growth inhibition of *Vibrio anguillarum* and *Staphylococcus aureus* or quorum sensing inhibition. Further 8 filamentous fungi with anticancer effects have been included in the study. The E-SPE kit has proven it-self to be fast, easy and reproducible in use and has therefore been implemented as a standard screening procedure at CMB when dealing with new extracts.

1. Houghton, P. J.; Raman, A. *Laboratory Handbook for the Fractionation of Natural Extracts*; 1 ed.; Chapman & Hall: London, 1998.
2. Cannell, R. J. P.; Dufresne, C.; Gailliot, F. P.; Venkat, E.; Kothandaraman, S.; Salituro, G. M.; Stead, P.; Gibbons, S.; Gray, A. I.; McAlpine, J.; Shankland, N.; Florence, A. J.; VanMiddlesworth, F.; Shimizu, Y.; Silva, G. L.; Lee, I.-S.; Kinghorn, A. D.; Wright, A.; Verrall, M. S.; Warr, S. R. C. *Natural Products Isolation*; 1st ed.; Humana Press Inc.: Totowa, 1998; Vol. 4th.
3. Cardellina, J. H.; Munro, M. H. G.; Fuller, R. W.; Manfredi, K. P.; Mckee, T. C.; Tischler, M.; Bokesch, H. R.; Gustafson, K. R.; Beutler, J. A.; Boyd, M. R. *Journal of Natural Products* **1993**, *56*(7), 1123-1129.