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Towards *Aspergillus niger* diagnosis based on a molecular biomarkers pattern defined from exometabolome complex data

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Hospital-acquired infections are present worldwide and microorganisms such as viruses, bacteria, fungi and parasites can be responsible for such infections. Fungal infections exhibit low occurrence; however, because they take longer to detect and treat, high rates of morbidity and mortality are known. Thus, fungal infections namely those associated to *Aspergillus niger* represent actual challenges especially for elderly, neonates or those having an underlying disease or under immunosuppressive drug treatments. Microbial metabolomics has been breaking new ground as a very useful tool in several areas including those related to microbial diagnosis. Microorganisms produce several volatile metabolites, the whole of which can be used as unique chemical fingerprints of each species and possibly of strain. This richness of information holds the promise for diagnosing infections. This research study aims to in-depth study the *A. niger* exometabolome in order to establish metabolites pattern that can be further exploited for fungal diagnosis. A methodology based on advanced multidimensional gas chromatography (HS-SPME/GC×GC-ToFMS) tandem with multivariate analysis was developed. Different growth conditions were assayed. *A. niger* exometabolome revealed around 500 metabolites distributed over several chemical families being the major ones alcohols, aldehydes, esters, hydrocarbons, ketones and terpenoids. A subset of 44 metabolites defined as the *A. niger* metabolomic biomarkers pattern was selected and successfully used to distinguish this species from others previously chosen revealing its useful potential.

Biography

Silvia M Rocha is an Assistant Professor in the Chemistry Department at the Aveiro University. She has done BA in Pharmaceutical Sciences at the Pharmacy Faculty (Coimbra University) and PhD in Chemistry (Aveiro University). For the last 22 years, she has performed studies on the characterization of plant-derived natural products, prospection of bioactive compounds and metabolomics applied to human fluids, plants and microbial systems. Her main skills are oriented to sample preparation and high through-put analysis based on comprehensive two-dimensional gas chromatography and mass spectrometry developments. She has published over 85 SCI papers, 2 books, 7 book chapters and 3 patent applications.

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