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Quantification of drug-metabolising enzymes in human liver microsomes: A comparison between label-free profiling and targeted quantitative analysis

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Xenonbiotic and drug-metabolizing enzymes (DMEs) are involved in the bioconversion of xenobiotics (including drugs, synthetic chemicals and environmental pollutants) into inactive or active metabolites. In pharmacological therapy, bioconversion can either lead to detoxification or activation of the drug, which has implications on treatment effectiveness and toxicity. Quantitative profiling of the drug-metabolising sub-proteome can be used in the characterisation of liver drug metabolism profiles in individual patients which can be a major step towards stratified or personalized medicine. Immunoquantification and targeted proteomics approaches have traditionally been used to determine abundances of CYP and UGT enzymes; however, bias in the determination of absolute protein abundance between laboratories and methods has been demonstrated. This may be due to differences in methodological workflows or the choice of suitable and specific standards. Label-free analysis can provide a venue for a new methodological setup. Advantages of this type of approach include the possibility of quantifying a large number of proteins without the need for specific standards, allowing comprehensive description of dynamic changes of expression in the proteome under study. As an alternative approach to previously used methods, we aimed to apply a label-free proteomic strategy to quantify and assess the absolute expression of several CYP and UGT enzymes in microsomal fractions extracted from 27 human livers which have previously been characterised.

Biography

Zubida Al-majdoub has completed her Under-graduate studies in Tripoli University, Libya and worked as Teaching Assistant at the same university. She has completed her MPhil in Medicinal Chemistry from School of Pharmacy, University of Manchester, followed by PhD in Quantitative Proteomics under the supervision of Dr. Jill Barber and Professor Simon Gaskell. She is a Research Associate at School of Pharmacy. Her research work focuses on "Quantification of transporters in human brain".

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