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## Role of Pharmacoproteomics in Drug Development

Priyanka R \*

Department of Pharmaceutical Analysis, MGR Medical University, Chennai, India

### Short Commentary

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#### \*For Correspondence

Department of Pharmaceutical Analysis, MGR Medical University, Chennai, India.

E-mail: [priyanka\\_r@omicsgroup.co.in](mailto:priyanka_r@omicsgroup.co.in)

### PHARMACOPROTEOMICS

Proteomics primarily could be a subdiscipline of functional genomics that measures the qualitative and quantitative changes in protein content of a cell or tissue in response to treatment or disease and determines protein-protein interactions. As a complementary approach to mRNA expression technologies, proteomics more and more is being applied to drug discovery process<sup>[1]</sup>. The pharmaceutical trade has expressed important interest in proteomics, with the expectation that this technology can result in the identification and validation of protein targets and, finally to the invention and development of effective drug candidates<sup>[2]</sup>.

Proteomics are divided as two main areas i.e. (i) Expression Proteomics, (ii) Functional Proteomics. The role of Expression Proteomics is the Analysis of various protein expressions by protein quantitation and identification. This protein analysis compares the expression profile of proteomes of cells, tissues or organisms in any condition of health problem, disease, injury, treatment, or intoxication to a standard proteome. Functional proteomics explains about the normal and abnormal interactions of proteins<sup>[3]</sup>. Isolation of protein complexes include Gene transcription, protein degradation, signal transduction, and cell cycle regulation to be done by multi protein complexes. There are different types of protein-protein interactions such as Isolation of Protein complexes, Yeast-2-Hybride method, Organelles<sup>[4-8]</sup>.

Pharmacoproteomics is an important tool of proteomic method to discovery of drug, development of drug, drug response at cellular tissues. In pre-clinical phase proteomic methods validate illumination of Drug mechanism of action and toxicity of drug<sup>[9-13]</sup>. In clinical phase explains about the drug response to the treatment. It explains regarding the patient to patient variation. Along with Pharmacogenetic and Pharmacoproteomics, Pharmacoproteomics support to molecular diagnostics for personalised medication<sup>[14-16]</sup>. Pharmacoproteomics approaches are applied to pharmacology, toxicology and drug development<sup>[17]</sup>.

Pharmacoproteomics is anticipated to be concerned actively in identification of targets of drug, understanding of mechanism of action, biomarker invention, and difficulty in pharmacokinetics & pharmacodynamics, analysis of drug formulation and delivery systems<sup>[18-21]</sup>. Pharmacoproteomics uses various proteomic strategies in discovery and development of medicines, and represents more regarding each variation in individual patient to drug response than genotyping strategies<sup>[19-23]</sup>.

Pharmacoproteomics plays a potential role drug metabolism and drug interactions because proteins are the main effectors of drug action and proteomic analysis constitutes a global approach for

the evaluation of alterations in protein response to administration of drug <sup>[24]</sup>. Biomarkers are naturally occurring genes or molecules which act as major indicators and particular pathological or physiological condition, disease can be identified. The Pharmacoproteomics analysis could be used in each and every pharmaceutical drug industry in every step i.e. target identification and method validation, analyzing the efficacy & toxicity of drugs and examine the mechanism of action of drug <sup>[25]</sup>.

Pharmacoproteomics methods conducted as, high concentration of an experimental drug has to be given to the patient or test Subject (clinical trials) for over time <sup>[23 - 25]</sup>. Then the consecutive analysis would be conducted by collecting the blood sample or serum sample. Every dose related response should be analysed thoroughly which correspond to the safety, efficacy and toxicity of drug.

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