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Personalised medicine: Introduction of genomics, proteomics and metabolomics in novel drug development and therapy

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Personalised medicine is a medical model designed to customize drug therapies to individual patients using their distinct characteristics including demographics, medical histories and most importantly their molecular information (genetic, protein and metabolic profile). Current drug development is principally based on epidemiological studies of large cohorts targeting development of so-called blockbuster medicines. This one-size-fits-all model do not account for individual differences in terms of genetics, proteins and metabolites thus may increase cost, adverse drug reactions and contribute to drug development failure in large clinical trials. Novel drug development and therapy should be based on the principal philosophy of 'every patient has a unique biology and pathophysiology that should be reflected in the choice of pharmacotherapy', thus resulting in an improved treatment outcome. Recent advances in genetic testing (genomics) have unveiled the potential relations between genetics and diseases. However, this method did not take into consideration of functional and environmental aspects which also play major roles in determining individual differences to clinical outcome. These aspects could be investigated and determined by techniques such as proteomic and metabolomic profiling. Molecular information obtained from these analyses may lead to a more targeted drug development strategy and therefore may reduce/prevent drug failure, cost and adverse drug reactions. Through these methods, hopefully the practice of theranostics, a diagnostic test that identifies patients most likely to be helped or harmed by a new medication, will be widely established. Besides that, these techniques may also provide a platform for preventative drug development strategy in future.

Biography

Baharudin Ibrahim obtained his Bachelor of Pharmacy in 2005 and Master of Pharmacy (Clinical Pharmacy) in 2007 from Universiti Sains Malaysia (USM). His PhD work was on metabolomics and respiratory medicine from University of Manchester in 2011. He has presented many of his works in international conferences such as American Thoracic Society and European Respiratory Society and published his researches in reputable journals. Dr. Ibrahim is currently working as a lecturer in Clinical Pharmacy specializing in respiratory medicine in USM. His researches focus on metabolomics and pharmacometabonomics to identify biomarkers of diseases and metabolites to predict adverse drug reactions.

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