**Applying Personalised Medicine in Clinical Practice**

Munir Pirmohamed, Wolfson Centre for Personalised Medicine, Waterhouse Building, 1-5 Brownlow Street, Liverpool, L69 3GL.

Personalised or precision medicine represents the overall concept of how drugs can be better targeted to individuals or groups of individuals to improve efficacy of the treatment, and minimize any safety issues, thereby improving the benefit-risk profile of the therapy. In order to achieve this goal, many different technologies will need to be utilised which includes all the omics technologies, drug pharmacokinetics and pharmacodynamics, and the use of wearable sensors, to name a few. While there has been a lot of emphasis on all omics technologies, genomics has had the greatest impact. Personalised or precision medicine approaches can be applied to chemical entities, cell therapies and nucleic acid-based therapies. For example, with respect to the latter, advances in gene therapy are beginning to produce real benefits in inherited diseases such as haemophilia, while antisense therapies are being utilised in a number of CNS conditions including spinal muscular atrophy and Huntington’s disease. Targeted therapies developed on the basis of the identification of somatic driver mutations are now the norm rather than the exception in cancer medicine, with combinations of treatments including targeted and immune therapies promising tractable responses in previously untreatable malignancies. Pharmacogenomics is also gaining traction with different approaches being used including (a) developing or repurposing drugs on the basis of mutations in disease causing genes; for example the use of ivacaftor in cystic fibrosis; (b) defining inter-individual variability in dose, for example with warfarin; and (c) in preventing serious adverse drug reactions; for example the use of HLA genotyping to prevent life-threatening adverse reactions such as toxic epidermal necrolysis. Pre-emptive genotyping approaches are also being used where genetic data Is available at the point of prescribing, much like the availability of liver and renal function tests. It is important that future generations of healthcare professional are trained in the area of precision medicine, as the complexity of new drugs increases, the therapy choices available increase and our ability to delve deeper into making the right therapeutic choices for patients improves.