People are all different, and this is no different when we consider people with diabetes, yet the current approaches to management of diabetes tend to treat everyone the same. The field of precision medicine aims to recognise these differences – whether at the level of their phenotype or at the molecular level. Faced with multiple, and increasing, treatment options for diabetes as well as increasing healthcare costs there is a clear need to target therapy to maximise benefit and reduce harm for every patient with diabetes.

This talk will discuss advances in precision medicine and pharmacogenetics in diabetes over the last decade. I will initially outline striking examples seen in monogenic diabetes: subtypes of Maturity Onset Diabetes of the Young and for Neonatal Diabetes caused by potassium channel gene mutations, where patients are often able to transfer off insulin injections onto oral treatment. However, patients with monogenic forms of diabetes are rare, and this lecture will move on to how we might begin to tailor treatment in more common forms of diabetes – such as type 2 diabetes. I will then provide an overview of our latest understanding of the genetics of type 2 diabetes, where >400 variants have been identified and where extremes of the polygenic risk score are associated with considerable differences in diabetes risk. Partitioning genetic risk into component pathophysiological processes also allows us to start to predict progression of diabetes or drug response based upon the individual underlying diabetes aetiology.

There is increasing evidence that genetic and other molecular and clinical characteristics will impact on treatment outcomes. The exciting challenge now is how we incorporate this information into clinical care and establish that this improves patient outcomes.