INTRODUCTION

Apolipoprotein E (APOE) plays a key role in lipid metabolism and is recognised as one of the most powerful genetic risk factors for dementia and other neurodegenerative diseases. It has become one of the most widely studied gene variants in Alzheimer's disease and constitutes a major consideration for preventive medicine. ApoE exists in three common isoforms (ApoE2, ApoE3 and ApoE4) which are coded by three co-dominant alleles (e2, e3, e4). As such six common ApoE phenotypes exist within the general population E2/E2, E3/E3, E4/E4 (homozygous) and E2/E3, E2/E4, E3/E4 (heterozygous). The presence of the ApoE4 isoform is recognised as a major genetic risk factor for development of Alzheimer's disease. The availability of analytical methods for rapid and reliable ApoE4 classification is therefore advantageous.

Biochip Array Technology (BAT) enables the determination of multiple analytes from a single sample. This technology has been successfully applied to a new biochip array to directly identify from a plasma sample whether patients are ApoE4 heterozygous, homozygous or null through simultaneous detection of both total ApoE levels and specific ApoE4 levels.

CONCLUSION

An individual’s APOE status has been shown to affect pre-symptomatic risk, diagnosis, prognosis, and treatment response for a variety of diseases, in particular Alzheimer's disease. The results show that BAT can be successfully applied to provide a platform to rapidly and accurately detect an individual's APOE4 status directly from a plasma sample. In combination with medical and family history, medication and lifestyle, this can deliver valuable information for personalised medicine approaches.