An abstract summary of the proposed lecture

GeNuIne (Gene-Nutrient Interactions) Collaboration: Towards implementing multi-ethnic population-based nutrigenetic studies of obesity in lower middle-income countries

Nutrigenetics refers to the study of the effect of genetic variation on dietary response. The ability of Nutrigenetics to determine what nutrients will produce the desired impact on metabolic balance is at the core of Personalized Nutrition. Individuals differ from each other in their genetic makeup due to which individuals respond differently to various lifestyle factors such as diet and physical activity. Obesity is a heritable trait that arises from the interactions between multiple genes and lifestyle factors. Although studies in developed countries have examined these interactions extensively, there are no such studies in lower middle-income countries (LMICs). Nutrigenetics has highlighted the complexity of gene-nutrient interactions but it offers opportunities to re-evaluate criteria used to set dietary guidelines and the contribution of genetic variation to optimal nutrition for individuals from different ethnic groups. To address this missing gap in nutritional science in LMICs, a large-scale collaborative project called GeNuIne (Gene-Nutrient Interactions) Collaboration that aims to implement nutrigenetic studies using cohorts from various ethnic groups has been initiated through the funding support from the British Nutrition Foundation. In this large-scale collaborative study, gene-nutrient interactions on obesity across multiple ethnic populations such as India, Pakistan and Sri Lanka (South Asia), Indonesia, Thailand and Malaysia (South east Asia), Turkey (West Asia), Morocco (North Africa), Ghana (West Africa) and Brazil and Peru (South America) are being examined through funds from the MRC, Newton Fund and GCRF. While diets high in saturated fatty acids have been shown to increase the genetic risk of obesity in Western populations, GeNuIne Collaboration has provided the first evidence for diets high in carbohydrates (mean intake of highest tertile: 560g/d), proteins (mean intake of highest tertile: 138g/d) and saturated fats (mean intake of highest tertile: 23.5g/d) to increase the genetic risk of obesity in South Asian (India and Sri Lanka), South East and West Asian (Indonesia & Turkey) and West African (Ghana) populations, respectively. If the interactions between genetic variations and nutritional requirements are better understood in various ethnic groups, dietary recommendations could be personalised according to genotype to ultimately promote health and reduce disease risk globally. Furthermore, novel functional foods could be developed in the food industry to match the requirements of an individual's genetic makeup for better health and wellbeing of individuals from different ethnicities.