Study questions

Genetics of allergic disease

Learning objectives: “Genetics of allergic disease”

1. To comprehend the principles of study design for genetic and genomic approaches to studying allergic disease.
2. To identify single nucleotide polymorphisms (SNPs) that have been identified as potential markers for allergic disease in the latest genome-wide association studies.
3. To apply knowledge of genetic studies to the pharmacogenetics of allergic disease.
4. To analyze mechanisms of genetic susceptibility to allergic disease and their associated candidate genes.

Question 1. Which of the following approaches to studying the genetics of allergic disease would be most appropriate to identifying the role of variation in a candidate gene in susceptibility to allergic disease?

A. positional cloning/linkage studies examining transmission of genetic markers with clinical phenotype in families
B. examination of “tagging” SNPs that capture the common variation in a defined region of the genome in a case-control cohort
C. using a genome-wide association study approach to assess variation across the whole genome to find polymorphisms associated with allergic disease
D. examining the effect of an amino acid variant on protein function in in vitro studies

Question 2. SNPs in or near which of the following genes have been found to be associated with asthma or allergic phenotypes in genome-wide association studies?

A. ORMDL
B. CHRNA3 (nicotinic acetylcholine receptor subunit)
C. IL13 (IL-13)
D. SH2B3 (SH2B adaptor protein 3)

Question 3. Which of the following genes have SNPs that have been associated with pharmacogenetic responses in asthma treatment?

A. CYP1A1 (cytochrome P450 1A1)
B. ADRB2 (β2-adrenergic receptor)
C. IL5 (IL-5)
D. CD14

Question 4. Which of the following pairs of mechanisms and genes correctly matches a proposed disease susceptibility mechanism for allergic disease with a relevant candidate gene?

A. modulation of the effect of environmental risk factors for allergic disease–IL13
B. loss of epithelial barrier function–FLG (filaggrin)
C. regulation of atopic inflammation–ORMDL3
D. tissue response genes–PHF11