

CONTINUING MEDICAL EDUCATION EXAMINATION

Asthma Exacerbations: The Genes Behind the Scenes

Instructions for obtaining 1.2 Continuing Medical Education Credits

Credits can be earned by reading the text and completing the CME examinations online throughout the year on the SEAIC web site at www.seaic.org



"Actividad acreditada por el Consejo Catalán de Formación Continuada de las Profesiones Sanitarias – Comisión de Formación Continuada del Sistema Nacional de Salud con 1,2 CRÉDITOS".



Activity sponsored by Astra Laboratories



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CME Items

- Which of the following is the most common trigger of asthma exacerbations in young children?
 - Rhinovirus C.
 - Influenza virus.
 - Rhinovirus A.
 - An allergen.
- Which of the following does a single-nucleotide polymorphism refer to?
 - An insertion or deletion of bases in the DNA sequence of an organism.
 - A variant DNA sequence in which the base of a single nucleotide has been substituted by another base.
 - The difference in the number of copies of alleles inherited from ancestral populations.
 - A type of structural variation that affects a large region of the DNA sequence.
- Which of the following applies to admixture mapping analysis?
 - It prioritizes regions where local genetic ancestry is associated with a certain trait of interest.
 - It uses more stringent genome-wide significance thresholds than genome-wide association studies.
 - It has not been carried out for asthma exacerbations.
 - It usually reveals genetic variants that exhibit similar minor allele frequencies across ancestral groups.
- Which are the most commonly explored human genetic variations?
 - Indels.
 - Deletions.
 - Copy number variations.
 - Single-nucleotide polymorphisms.
- Which of the following applies to a genome-wide association study?
 - It interrogates genetic variation across the genome without requiring a previous biological hypothesis.
 - It interrogates genetic variation located exclusively in coding regions of the genome.
 - It interrogates genetic variation in a discrete region of the genome.
 - It interrogates the relationship between gene expression and a trait of interest.
- On which of the following have most of the pharmacogenomic genome-wide approaches applied to asthma exacerbations focused on?
 - Long-acting β -agonists.
 - Inhaled corticosteroids.
 - Leukotriene receptor antagonists.
 - Short-acting β -agonists.
- Which of the following is true?
 - Gene body DNA methylation usually leads to gene repression.
 - Promoter DNA methylation is associated with active transcription.
 - Most CpGs in the human DNA methylome are located in regions of high CpG density.
 - Most CpGs in the human DNA methylome are hypermethylated.
- Which of the following is true?
 - The microRNAs that predict future asthma exacerbations with an adequate AUC have been validated across multiple populations.
 - The microRNAs involved in asthma exacerbations participate in phosphoinositide 3-kinase/protein kinase B and mitogen-activated protein kinase signalling.
 - None of the microRNAs associated with asthma have previously been associated with other respiratory traits.
 - MicroRNAs are pretranscriptional regulators that exert their effects by binding to the 3' untranslated regions of mRNAs leading to mRNA deadenylation and subsequent degradation.
- Which of the following is true?
 - Differentially methylated regions consider only the effect of 1 CpG per region.
 - Multiple histone modifications have been associated with asthma exacerbations.
 - Hypomethylation at CEACAM5 has been associated with a higher risk of asthma exacerbations.
 - The 3 main epigenetic mechanisms that cooperate to regulate gene expression comprise DNA methylation, histone modifications, and noncoding RNAs.
- Which of the following is true?
 - Microorganisms can interact with their host's biological layers to modulate the risk of a disease or condition.
 - There are no differences between the bronchial transcriptome of frequent exacerbators and that of infrequent exacerbators.
 - Blood hypomethylation in asthma is largely driven by a higher eosinophil count in blood.
 - Multiple differentially methylated regions have been revealed for asthma exacerbations.