molecular interventions
pharmacological perspectives from biology, chemistry and genomics

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DEPARTMENTS

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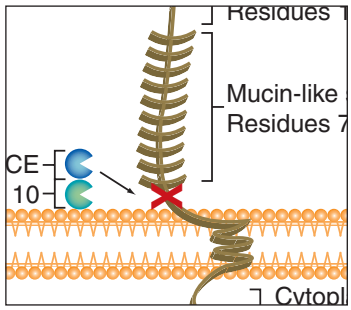
VIEWPOINTS



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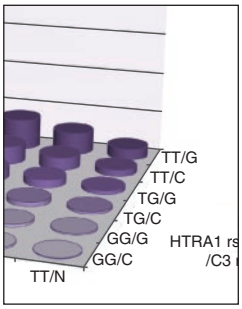
A "kine" of inflammatory therapy

A better understanding of the immunological processes governed by cytokines and chemokines has shaped our approach to the design of therapeutics for diseases such as rheumatoid arthritis (RA), atherosclerosis, and other inflammatory disorders. The discovery of chemokines and their receptors as integral components and regulators of inflammation has dramatically contributed to advances in treating these disease states. Among the different classes of chemokines, fractalkine/CX3CL1, with its unique functional and structural characteristics, has been found to participate in inflammation. This viewpoint summarizes the emerging role of fractalkine/CX3CL1 from the historical, functional, and clinical perspective and provides evidence to validate it as a potential therapeutic target in cardiovascular disease, rheumatoid arthritis, as well as other diseases related to vascular inflammation.

Brian Jones, Maria Beamer, and Salahuddin Ahmed

REVIEWS



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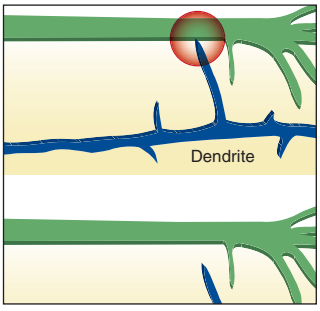
Eying models

Age-related macular degeneration (AMD) is the most common cause of visual impairment among the elderly in developed countries, and its prevalence is thus increasing as the population ages. Unfortunately, treatment options remain limited because the etiology and pathogenesis of AMD are incompletely defined. Recently, gene association and mechanistic studies have confirmed that AMD involves the interaction of multiple genetic and environmental factors. The identification of genes that have a substantial impact on the risk for AMD is not only facilitating the diagnosis and screening of populations at risk, but is also elucidating key molecular pathways of pathogenesis. In this way, modern research into AMD exemplifies the power of pharmacogenetic studies, not only with respect to the dawning of personalized medicine, but also in terms of refining our molecular understanding of disease.

Yuhong Chen, Matthew Bedell, and Kang Zhang

Most of the synapses that appear in the developing central nervous system (CNS) are formed *en passant*, meaning they occur along the length of the extending axon, and not merely at the axon terminus. The construction of CNS synapses thus ensues from the temporal and spatial coordination of contacts between growing neurons, and this coordination is predicated on the formation of subcellular structures in each of the neurons that contribute to synapse formation. This review focuses on the proteins and vesicular processes that corroborate in the formation of presynaptic terminals. Understanding the delivery of vesicular cargo to the developing synapse, along with elucidation of the interplay among protein and membrane components at the nascent synapse, is relevant for treating brain diseases as diverse as autism, epilepsy, anxiety disorders, brain injury, and Alzheimer's disease.



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Bridging neurons in the brain

Luke A. D. Bury and Shasta L. Sabo

REVIEWS, *continued*