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Therapeutic targeting of NLRP3 inflammasome by natural products

Key words: NLRP3 inflammasome, NLRP3-associated diseases

The NLRP3 inflammasome is a multiprotein complex composed of NLRP3, caspase-1 and ASC that plays a key role in the immune system. The NLRP3 inflammasome senses and can be activated in response to a highly diverse range of pathogens and environmental and endogenous danger molecules, such as Escherichia coli, nanoparticles of silicon dioxide, ATP, cholesterol crystals, uric acid crystals, amyloid-β and islet amyloid polypeptide. Although the NLRP3 inflammasome is important in innate immunity to fight infection, excessive activation of this complex is involved in a variety of common diseases, including atherosclerosis, type 2 diabetes, neurodegenerative diseases, gout and cancers. Therefore, the NLRP3 inflammasome activity and the associated signalling pathways are common targets for next-generation therapeutics. In this talk I will introduce the NLRP3 inflammasome mechanism of action, the role in diseases and therapeutics. I will also introduce the cell and animal models for studying the NLRP3 inflammasome and NLRP3-associated diseases. Additionally, I will show you some natural and synthetic compounds that can be used for ameliorating the NLRP3-associated complications. After this talk, I hope I have the opportunity to collaborate with you in investigating the NLRP3 inflammasome and its inhibitors in the near future.

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