Insight Medical Publishing

JOURNAL OF ORGANIC & INORGANIC CHEMISTRY

C-reactive protein has the potential to inhibit trauma-induced interleukin-1β release

Veronika Garu

Laboratory of Experimental Surgery at Giessen University, Germany

Abstract

Background

C-reactive protein (CRP) is an acute phase reactant mainly produced in the liver in response to elevated levels of interleukin-1β (IL-1β) and IL-6. Its clinical relevance as an indicator of inflammation is outstanding but the biological functions are poorly defined. CRP belongs to the family of pentraxins and calcium-dependently binds ligands containing a phosphocholine head-group. We demonstrate that CRP isolated from human bodily fluids is an unconventional agonist of monocytic nicotinic acetylcholine receptors (nAChR) containing subunits α7, α9 and α10. Marginally pathologic CRP levels (IC50 = 4.9 mg/l) efficiently inhibit ATP-dependent NLRP3 inflammasome activation and IL-1β maturation by human monocytic cells. This activity of CRP critically depends on bound phosphocholine-containing ligands. Remarkably, CRP does not trigger canonical ionotropic nAChR functions in excitable cells but inhibits the ionotropic function of the ATP-sensitive P2X7 receptor in monocytic cells. The ATP-independent release of IL-1β typically caused by pathogens and the release of inflammasome-independent cytokines, however, remain unimpaired. In a prospective think around on numerous injury patients IL-1β plasma concentrations conflictingly associated with going some time recently CRP levels, whereas inflammasome-independent cytokines earnestly associated. We suggest that CRP evolved as a negative feedback-regulator of ATP-dependent NLRP3 inflammasome activation and IL-1β release and thus, is an efficient safeguard against trauma-associated sterile inflammation.

JUSTUS-LIEBIG-UNIVERSITÄT GIESSEN

Biography

Veronika Grau, Prof., Dr. rer. nat., is heading the Laboratory of Experimental Surgery, University Giessen, since 2003. She studied biology in Freiburg and graduated with a doctorate on the embryogenesis of Drosophila. As a postdoctoral fellow she joined the laboratory of Prof. René Lafont at the École Normale Supérieure, Paris. Thereafter, she worked as research assistant in the Institute of Anatomy and Cell Biology, Marburg, and completed her postdoctoral habilitation before she accepted her present position in Giessen. She is faculty member of the Excellence Cluster Cardio Pulmonary Systems and coordinator of the disease area End-Stage Lung Disease of the German Center for Lung Research. The research of V. Grau focuses on experimental organ transplantation and on the cholinergic control of innate immunity.

10th Annual Congress On Medicinal Chemistry and Drug Design | Amerstdam|Netherlands| March 25, 26, 2020

Citation: Veronika Garu, *C-reactive protein has the potential to inhibit trauma-induced interleukin-1β release* | 10th Annual Congress on Medicinal Chemistry and Drug Design | Mar 25-26, 2020 | Amerstdam, The Netherlands