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The cytokine inflammation pathway in healthy ageing and age-related diseases

Irene Maeve Rea^{1,2}¹Queens University, United Kingdom²University of Ulster, United Kingdom

The question why some people age well and reach ninety years of age in apparent good health while others develop a plethora of age-related disease, remains a perplexing question. But there are some recent signposts and insights into the understanding of the role of inflammation in both healthy aging and age-related diseases. The inflammatory response must be tightly controlled to ensure effective immune protection thorough out life otherwise uncontrolled inflammation can become damaging and destructive. Cytokine dysregulation is believed to play a key role in the remodeling of the immune system at older age, where lose of the fine-control of systemic inflammation seems to be associated with both good quality ageing and age-related disease. The reshaping of the cytokine expression pattern, with a progressive tendency toward a pro-inflammatory phenotype has been called inflammaging and it seems to be associated with most major age-related diseases such as atherosclerosis, diabetes, rheumatoid arthritis and ageing itself. Several common molecular pathways have been associated with low-grade inflammation, and activation of the NF- κ B cytokine and the IL-1-mediated inflammatory cascade. The age-related change in redox balance, the increase in

age-related senescent cells and senescence-associated secretory phenotype (SASP), and the decline in effective autophagy can trigger the inflammasome, which is central to the inflammatory cascade. Here we will discuss some aspects of the present understanding of the molecular mechanisms that trigger inflammation and related it to findings in various age-related diseases and from long-lived nonagenarian cohorts who exemplify good quality ageing.

Biography

Irene Maeve Rea has completed her Medical degree at Queens University, Belfast before carrying out research towards her MD Postgraduate research at Stanford University, School of Medicine. She is a Consultant Physician in Geriatric Medicine, an Emeritus Professor at Queens University Belfast, and a Visiting Professor at the University of Ulster in the Northern Ireland Centre for Stratified Medicine. Both her clinical and research interests are in the areas of immunology and genetics specializing in the 'Oldest Old' members of the population in innovative studies of 90-year-old siblings with support by an EU-funded European collaboration (Genetics of Healthy Ageing) and the Wellcome Trust.

i.rea@qub.ac.uk