NEWS

Pyroptosis

It is a highly inflammatory form of apoptosis. We are familiar with the term apoptosis which is defined as programmed cell death. Well, pyroptosis is a specialized form of apoptosis which is most commonly initiated with an infection with intracellular pathogens as part of the antimicrobial response.[1] The intracellular pathogen is considered as a pathogen and immune cells release pro-inflammatory cytokines leading to swelling and subsequent rupture. The released cytokines attract other immune cells to fight the infection and contribute to further inflammation in the tissue. Pyroptosis ensures rapid clearance of various bacterial and viral infections. In contrast to apoptosis which largely operates through caspase 3 leading to cytochrome release reaction, pyroptosis requires caspase 1 enzyme. In a healthy cell, caspase-1 activation helps to fight infection caused by Salmonella and Shigella through introducing cell death to restrict pathogen growth. However, unlike apoptosis, cell death by pyroptosis results in plasma membrane rupture, and the release of damage-associated molecular pattern molecules such as ATP and DNA fragments., and inflammatory cytokines interleukin-1 beta (IL-1β) and IL-18. In contrast to the noninflammatory phagocytic uptake of membrane-bound apoptotic bodies in apoptosis, pyroptosis is inflammatory. Therefore, in case of persistent inflammation, it produces excessive immune cells which will become detrimental to host cell. It may result in metabolic disorder, autoimmunity, etc., The level of expression of these inflammasome and specifically caspase-1 has direct relation with the severity of several metabolic syndromes such as obesity, type 2 diabetes mellitus due to subsequent secretion of insulin-impairing interleukins like IL 18. Few studies also demonstrated that caspase-1-mediated pyroptosis drives CD4 T-cell depletion and inflammation by HIV. Therefore, further research in this area is warranted.[2,3]

References

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Sense of Smell and Hunter-Gatherer Lifestyle

For the first time, a recent study indicates that the cultural practices of hunter-gatherers actually enhanced their smell-detection skills. This was shown in the Semaq Beri hunter-gatherers, living in tropical forests on the Eastern side of the Malay Peninsula in Southeast Asia. They were compared with Semelai rice farmers, who live in forest outposts near the Semaq Beri and speak a closely related language, but find odors much more difficult to name than colors. Apparently, the odor-identifying ability is produced due to the interaction of genetics with personal experiences of different smells and also one's cultural background. The forest dwellers are more accustomed to odors due to their lifestyle which requires using their sense of smell to hunt and avoid danger. Among the Semaq Beri, 18 individuals completed an odor-naming task for the study, and 16 of them also completed a color-naming task. Among the Semelai, 21 participants completed both tasks. The participants sniffed marker pens that emitted a total of 16 smells, including orange, leather, rose, and fish. For the color-identifying task, participants viewed 80 differently hued chips and named 20 of them. All questions were asked in their native language. For the hunters, the sense of smell carried practical and cultural importance. For example, they must recognize the scent of tiger urine in the forest, to avoid the predatory cats nearby. Furthermore, they avoid killing certain prey that exudes smells associated with pregnancy, so that these animals would not die out which is embedded in their culture. However, it was an observational study, and it is yet to discover if Semaq Beri individuals display genetic characteristics linked to their keen sense of smell or if growing up in a foraging society leads to epigenetic modification in odor perception.[1]

Reference

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Interfering with Vascular Cell Adhesion Molecule 1 May Help Prevent the Premature Aging of Brains

Vascular cell adhesion protein 1 also known as vascular cell adhesion molecule 1 (VCAM-1) or cluster of differentiation 106 is a protein that in humans functions as a cell-adhesion molecule. VCAM1 interacts with immune cells in response to inflammation. As mice and humans age, the levels of this protein circulating in the blood rises. In a study injecting young mice with plasma from old mice, it was found that VCAM1 levels also rose in certain parts of the blood–brain barrier. The young mice showed signs of brain deterioration as well, including inflammation and decreased birthrates of new nerve cells. However, when the experiment was repeated using plasma from young mice, it had no such effects. Then, the experiment was repeated with plasma from old mice and injected into young mice which were now genetically engineered to lack VCAM1 in certain blood–brain barrier cells. This time the aging effect was not as strong as before. Similarly, it did not have equal effect when mice were treated with anti-VCAM1 antibody. Therefore, interfering with VCAM1 may help prevent the premature aging of brains. These results suggest that the future of antiaging treatments may succeed targeting specific aspects of the blood–brain barrier which may involve targeting the activity of VCAM1.[1]

Reference

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VIEWS

Include Natural Anthocyanin in Your Diet

Anthocyanins are water-soluble vacuolar pigments and may impart red, purple, or blue color. They are found in all tissues of higher plants including leaves, stems, roots, flowers, and fruits. Physiologically, they have the antioxidant role in plants against reactive oxygen species caused by abiotic stresses. Therefore, when consumed through diet, they provide natural protection against cellular stress. Much has been written, spoken, and discussed about the ill effects of stress on our health. Therefore, it is essential that we gain combating power against stressors in a daily regime. The most effective way is to modify our diet which we consume minimum three-to-four times a day! Lets see what are the common and good sources of this anthocyanin. Plants rich in anthocyanins are such as blueberry, cranberry, black raspberry, red raspberry, blackberry, blackcurrant, cherry, eggplant (aubergine) peel, black rice, pink-colored grape, red cabbage, peaches, and apples. Anthocyanins are less abundant in banana, asparagus, pear, etc., for a long time, there were not many studies directly linking consumption of anthocyanin-rich food and immediate increase in antioxidant level in humans. However, its metabolites in the gastrointestinal tract and blood may have such biological properties. Nevertheless, it is a compound which is found in fruits, berries, and vegetables which are part of a balanced diet. One recent study showed that oral intake of anthocyanosides from blackcurrants resulted in significantly improved night vision adaptation in humans. Certain anthocyanins from blackcurrant stimulated regeneration of rhodopsin in experimental models. It was also found to reduce cancer cell proliferation and to inhibit tumor formation markedly by acting on MAP kinase pathway. No doubt our forefathers always advised to eat colored leafy vegetables and fruits even without doing such research. Therefore, the inclusion of anthocyanin-rich food can very well add to balanced diet and boost our general health.

Address for correspondence: Dr. Nivedita Nanda,
Department of Biochemistry, JIPMER, Puducherry, India.
E-mail: drnnivedita@gmail.com