NUTRITION

Understanding the ketogenic diet

Cell https://doi.org/10.1016/j.cell.2020.04.027 (2020)

Credit: Shana Novak/DigitalVision/Getty

A ketogenic diet influences the composition of the microbiome, which in turn influences intestinal T_H17 cells.

Very-low-carbohydrate high-fat diets induce ketone production and are used for the treatment of multiple diseases. However, their mechanism of action is unclear.

Ang et al. hypothesized that they might act thought the microbiome. They found that these diets did indeed alter human microbiome structure and function. Furthermore, they were able to show that in mice, the result of this was a reduction in pro-inflammatory T_H17 cells in the gut. Further investigation will elucidate the importance of this in the diets' disease-modifying effects. *HS*

https://doi.org/10.1038/s41591-020-0956-7

AGING

T cells as regulators of senescence

Science https://doi.org/10.1126/science.aax0860 (2020)

Aging T cells regulate multiple features of aging in mice, and their dysfunction may lead to age-associated disease.

Aging is known to result in an increased susceptibility to disease, but the mechanisms by which this occurs are largely unknown. There are known changes in metabolism that occur during the aging process that are thought to contribute to this.

Desdín-Micó et al. mimic a process in mice that occurs during aging — the loss of mitochondrial function in T cells — through the use of genetic knockout models. This results in multiple age-related features, including the increase in circulating cytokines known as 'inflammaging', which, they show, induces senescence in mice. This role of T cells in regulating organismal lifespan could be involved in age-associated diseases. *HS*

https://doi.org/10.1038/s41591-020-0954-9

INFECTIOUS DISEASE

Vaccination combats antimicrobial resistance

Nature **581**, 94–99 (2020)

Childhood vaccination can reduce the amount of infections treated with antibiotics and, hence, the prevalence of antimicrobial resistance.

Infection with antimicrobial-resistant bacteria poses a worldwide threat, and the greatest morbidity is for those in low- and middle-income countries. Furthermore, it is known that consumption of antibiotics contributes to its prevalence, which contributes to conflicting tensions in such countries.

Lewnard et al. analyzed data from demographic and health surveys from 18 countries on the prevalence of pneumococcal conjugate vaccines and live attenuated rotavirus vaccines, the incidence of infection in those areas and antibiotic usage in children. These vaccines are part of the World Health Organization's expanded vaccination program, and the results show that this program also reduces the incidence of antibiotics-treated disease. *HS*

https://doi.org/10.1038/s41591-020-0957-6

NEURODEGENERATION

A personal approach for Parkinson's disease

N. Engl. J. Med. **382**, 1926–1932 (2020)

A tailored therapy approach with induced pluripotent stem cells improved the symptoms of a patient's Parkinson's disease.

Parkinson's disease is a progressive, debilitating disease and is linked to neuronal loss in the substantia niagra, which causes striatal dopamine deficiency. Approaches attempting to replace or regenerate these neurons have been studied for a long time; however, nothing has proven effective.

A group of researchers in the USA were able to derive induced pluripotent stem cells from a patient with Parkinson's disease and were able to differentiate these into dopaminergic progenitor cells. Two separate transfers of these cells into the patient's brain were made with no immunosuppressants. At 18–24 months after the transfers, there was an improvement in the patient's symptoms without any adverse effects. The approach needs to be further tested in a clinical trial and needs to be analyzed after additional follow-up before it can be considered for clinical use. *HS*

https://doi.org/10.1038/s41591-020-0958-5

PEDIATRIC DISEASE

Kawasaki disease in a COVID-19-struck region

Lancet https://doi.org/10.1016/S0140-6736(20)31103-X (2020)

An increased incidence of Kawasaki-like disease in children has been seen in Bergamo, an area extensively affected by the coronavirus SARS-CoV-2.

Kawasaki disease is a severe disease that exclusively affects children. It causes acute inflammation of the blood vessels that is also linked to other inflammatory pathogenesis, such as macrophage-activation syndrome. It is thought to be triggered by previous infection.

Researchers in the Bergamo province of Italy evaluated the incidence and features of children diagnosed with Kawasaki disease before and during the recent COVID-19 outbreak. They found that there was a 30-fold increased incidence of the disease in the month that they analyzed relative to its incidence before the outbreak. These most recent cases also had unique presentation. *HS*

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