Department of Pharmacy

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PHARMA HIGHLIGHTS

ISSUE 44 | MAY 2018

Genomic Markers Identified for Infant Soft Tissue Tumors

Epidermal Growth Factor Receptor (EGFR) maintains cellular growth and division normally but can become mutated, as in the case with some cancers, so that too many receptors allow exponential, uncontrolled cellular growth and division resulting in a tumor. EGFR is implicated and/or found in many cancers including lung, breast, head, neck, and colorectal. EGFR is a transmembrane kinase glycoprotein which is commonly associated with different cancers as part of gene rearrangements where the EGFR signaling pathway becomes deregulated.

B-Raf is another kinase protein associated with processing mitogenic signals between the cell membrane and the nucleus of a cell whose enzymatic activity has been associated with Epidermal Growth Factor and Human Growth Factor ligands. The gene BRAF is considered a proto-oncogene; BRAF rearrangements result in a multitude of cancers including melanoma and colorectal cancer.

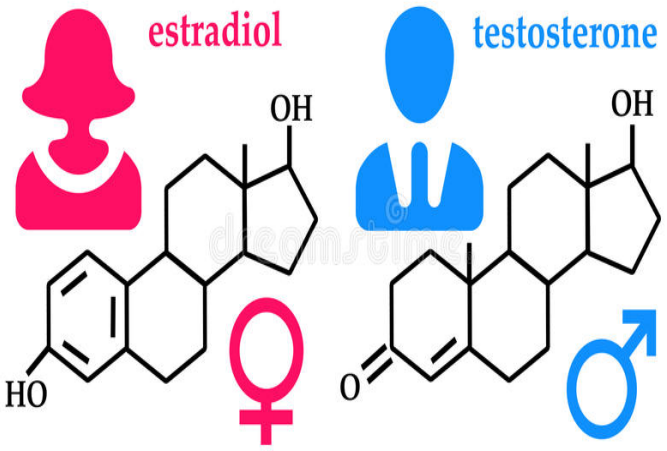
A new article from Nature Communications now outlines a newly discovered connection between multiple different infant soft tissue tumors and these two specific genes. Childhood tumors, especially those present at infancy are often confined to age and developmental stage but little has been known about their etiology and treatment. Congenital mesoblastic nephroma (CMN) is renal malignancy in children under 6 months old. Researchers have examined soft tissue tumors for the presence of EGFR or BRAF rearrangement as a diagnostic marker and found that in all CMN specimens evaluated, there was a single in-frame internal tandem duplication (ITD) within the EGFR domain. The EGFR-ITD was not observed in other tumor types like glioma or adenocarcinoma of the lung. These genomic findings are ground breaking for cancer treatments and for the future development of novel treatments.

Source: SalkNature Communications, Oncology Reports

Why are women more prone to autoimmunity than men?

There has been a long standing confusion, about why females are more likely to develop autoimmune diseases. Scientists at the University of Gothenburg investigated the disproportionate prevalence of autoimmune disease and offer a new, hormone-related theory for female vulnerability. "It's very important to understand what causes these diseases to be so much more common among women, in this way, we can eventually provide better treatment for the diseases." The new study operates under the theory that testosterone provides protection against autoimmune disease. Women on an average have just ten percent of the testosterone that men do, implying that they likely do not receive the same protective effects that testosterone is proposed of possessing. A recent study by University of Turku found that estrogen plays a role in women being more prone to autoimmunity. As opposed to testosterone, women produce a lot more estrogen than men do. Researchers found that estrogen receptor proteins cause dysfunction in regulatory T cell activity, T cells are cells that maintain the balance between too much inflammation and too little inflammation and they are often implicated in autoimmune disease pathology.

In this new study, researchers observed testosterone reducing the number of B cells, which produce antibodies. This research can therefore shed light into how to prevent autoimmune diseases in individuals using hormone therapy.



Source: University of Gothenburg

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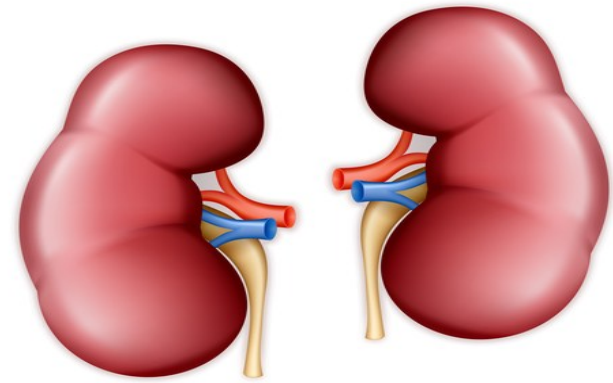
Relief of Chronic Kidney Disease with Cannabis



As cannabis is legalized in more and more states in the US it brings about questions regarding its effects on the human body. A new study conducted by Harvard University's School of Public Health and Harvard Medical School reveals there's no link between marijuana use and kidney disease at least among younger individuals using the drug in moderation. "Our research provides some reassuring evidence suggesting that there is no detrimental effect of infrequent, relatively light use of marijuana on kidney function among healthy adults under age 60," said lead investigator Dr. Murray Mittleman. "However, our research does not address heavy users, the elderly, or those with pre-existing chronic kidney disease," Mittleman said in a Harvard news release. "Research is needed to evaluate the impact of marijuana use in adults 60 and over, and among those with existing or at risk of developing kidney disease." Mittleman's team analyzed data from nearly 14,000 U.S. adults, ages 18 to 59, from 2007 to 2014. Levels of microalbuminuria, a marker for kidney disease, were analysed by researchers and no association was found between past or current cannabis use and worsened kidney function or disease. Furthermore, cannabis could prevent kidney damage while also relieving pain and other symptoms. Often nonsteroidal anti-inflammatory drugs are used to reduce the pain but result in harmful chemicals entering the bloodstream and puts stress onto the kidneys as the numerous non-steroidal anti-inflammatory drugs including Ibuprofen, Advil, Motrin, Aspirin, and Aleve contain substances that are actually toxic to the kidneys. The research performed to shows that cannabis does not cause damage to the kidneys making it a promising alternative to harmful anti-inflammatories and opioids.

Source: Webmd, mayoclinic, frenchtoast, project CBD, youtube.

Vitamin A Gives Immune System Power to Fight Tuberculosis

Multidrug-resistant tuberculosis bacteria are a serious health concern for the global population. A new finding offers a new therapeutic solution that may be impervious to the development of resistance. Tuberculosis (TB) is a potentially serious infectious disease that mainly affects your lungs. The bacteria Mycobacterium tuberculosis causes tuberculosis spreads from one person to another through tiny droplets released into the air via coughs and sneezes.

Scientists at Trinity College Dublin have shown how vitamin A supports the lung immune system in the fight against TB, indicating a new type of immunotherapy that could help treat the highly infectious disease. Interestingly, vitamin A deficiency is relatively common in TB patients and people with this deficiency are ten times as likely to develop the disease. In the new study, researchers

investigated the relationship between vitamin A and the immune system during TB infection and found that increased vitamin A consumption greatly improves an immune process called autophagy. Fulfilled mostly by phagocytic cells like macrophages, autophagy consists of breaking down and recycling dead and dying cells, cellular debris, and pathogens through phagocytosis. Furthermore, researchers found that vitamin A consumption enhances the phagocytic activity of macrophages during a TB infection. Paired with the finding from a previous study that vitamin A also promotes anti-inflammatory activity, researchers were assured that vitamin A is a potential life saver.

Source: Centers for Disease Control and Prevention, National Institutes of Health Office of Dietary Supplements, Trinity College Dublin.