

## Children with Common Allergies have Twice the Heart Disease Risk

**R**esearchers found that kids with allergies had higher rates of being overweight or obese — both risk factors for heart disease than children who don't have these allergic conditions. The investigators also found that children and teens with asthma or hay fever were twice as likely to have high blood pressure or high cholesterol, which are also risk factors for heart disease, according to the study, published in the *Journal of Allergy & Clinical Immunology*. The findings suggest that allergic diseases can have harmful effects on other aspects of a child's health, said study author Dr. Jonathan Silverberg, an Associate Professor, Dermatology, Northwestern University Feinberg School of Medicine in Chicago. Recognizing these harmful effects may help to prevent heart disease or treat it early, he said. It remains unclear whether treating allergy conditions might lower a child's risk for heart disease. In the study, the researchers analyzed data collected from about 13,000 children in the United States, whose parents answered questions about the children's health as part of the 2012 National Health Interview Study (NHIS). From the data, the researchers estimated that 14 percent of American children have asthma. The scientists also estimated that about 17 percent of children have hay fever and 12 percent have eczema. The new study is not the first evidence of a link between common allergic conditions in children or adults and an increased risk of cardiovascular disease. Exactly why kids who wheeze from asthma, sneeze from seasonal allergies or itch



from eczema may have more risk factors for heart disease at earlier ages is not clear, the researchers said. However several mechanisms could explain this link. It may be that the harmful effects of inflammation that occur in children with allergic disease also play a role in

heart disease. The link might also be related to the lower levels of physical activity and greater rate of obesity in children with asthma and allergic disease. The strength of the new study are its large size and use of data obtained from interviewing parents. They also noted some limitations, including that it relied solely on parental reports of children's health and did not include specific information about the children's lifestyle habits, diet or the severity of their allergic diseases. More studies need to be performed as the scale of research is not enough to give conclusive evidence. However, allergies need to be checked out as soon as they seem to develop and enough knowledge needs to be obtained about the lifestyle of the child.

—**Labiba**

<http://www.labroots.com/trending/immunology/2596/heart-disease-strike-kids-allergie>

## Digital PCR for Liquid Biopsy

**L**iquid biopsy is a noninvasive method used for the diagnosis and monitoring of disease states, including cancer. Instead of physically taking a biopsy of the affected tissue, cell-free DNA (cfDNA), circulating tumor DNA (ctDNA, a subset of cfDNA present only in tumors), or cancer cells in suspension (also known as circulating tumor cells, CTCs) are collected from blood or other fluids. These noninvasive tests detect fragments of DNA or cells in blood or, occasionally, other bodily fluids. Cell-free DNA (cfDNA) refers to segments of DNA that are mainly derived from apoptotic and necrotic cells. The cfDNA circulating in the blood can be used for testing a range of diseases including cancer, diabetes, and even myocardial infarction, as well as monitoring transplanted organs in their recipients. In the case of cancer, cfDNA is often referred to as circulating tumor DNA, or



ctDNA. Since tumors shed cells, circulating tumor cells (CTCs) can also be used for the detection and monitoring of cancer. Now digital PCR is a powerful technology that provides absolute quantification of nucleic acids with a high degree of sensitivity and precision. In blood, the cfDNA, ctDNA, and CTCs of interest are present at low levels and found in a complex background of other components. Additionally, circulating DNA is highly fragmented, which further reduces the concentration of intact target sequence. The recent advent of more sensitive screening techniques, such as digital PCR, has permitted the detection and quantification of low abundance targets in shorter times without requiring large numbers of replicates. This has established digital PCR as a tool of choice for liquid biopsies. It has been established as a fast and accurate tool for detecting and monitoring an increasing number of different types of cancers. The unmatched sensitivity of digital PCR for detecting low abundance targets in complex backgrounds will play a major role in the use of liquid biopsies. This technology provides fast detection and accurate quantification of disease markers and accomplishes this with a minimal amount of discomfort for the patients. —**Fabiha Tasnim**

<http://www.bio-rad.com/en-in/applications-technologies/digital-pcr-liquid-biopsy>

## B Cells in the Spleen Manipulated to Treat Sepsis

**R**esearch team centered at the University of Tsukuba has recently reported that B cells, which are mostly known for antibody production in the face of invading pathogens, provide another function in the form of marginal zone B cells in the spleen. It has been found that marginal zone B cells in the spleen can exacerbate the inflammatory response to a dangerous level which can lead to entire body inflammation, known as sepsis. Along with producing the signaling proteins cytokines and chemokines involved in inflammatory responses, marginal zone B cells specifically produce a pro-inflammatory cytokine called interleukin-6 (IL-6). Considering the fact, the research team from the University of Tsukuba designed a study to understand precisely how marginal zone B cells and IL-6 work to cause sepsis with the hopes of discovering a new way to prevent the transition of sepsis into systemic inflammatory response syndrome (SIRS), which can often lead to death. Tsukuba researchers started by injecting mice with lipopolysaccharide (LPS) from *E. coli*. Here, they clearly observed increased resistance and survival in with a normal population of

marginal zone B cells. After examining the signaling process in greater detail, the researchers found a third player in the exacerbation of the inflammatory response to LPS: toll-like receptor 4 (TLR4). In this study, TLR4 was found to be required for IL-6 production, and the Tsukuba researchers observed that LPS directly stimulates the marginal zone B cells to produce IL-6 through TLR4. Lastly, the researchers also studied Fc $\alpha$ / $\mu$ R. Fc $\alpha$ / $\mu$ R is mainly expressed on lymphoid tissue immune cells, where it acts as a receptor for IgA and IgM antibodies. It is also expressed on Marginal zone B cells, but its role there was unknown. In this study, the researchers worked on Fc $\alpha$ / $\mu$ R-deficient mice and found that their marginal B cells produced much less IL-6 in response to LPS than those of control mice. Whether it's one of the three players that are targeted for sepsis treatment or a combination of all three, it is clear that the researchers from the University of Tsukuba are well on their way to developing new therapies for sepsis.

–Noshin Mubtasim

<http://labroots.com/trending/immunology/3069/cells-spleen-manipulated->

## FDA Approves New Drug for Bladder Cancer

**T**he U.S. Food and Drug Administration approved Tecentriq (atezolizumab) to treat the most common type of bladder cancer, called urothelial carcinoma. This is the first product in its class (PD-1/PD-L1 inhibitors) approved to treat this type of cancer. Tecentriq is approved for the treatment of patients with locally advanced or metastatic urothelial carcinoma whose disease has worsened during or following platinum-containing chemotherapy, or within 12 months of receiving platinum-containing chemotherapy, either before (neoadjuvant) or after (adjuvant) surgical treatment. Urothelial carcinoma is the most common type of bladder cancer and occurs in the



urinary tract system, involving the bladder and related organs. The National Cancer Institute (NCI) estimates 76,960 new cases of bladder cancer and 16,390 deaths from the disease in 2016. The most common side effects of treatment with Tecentriq were fatigue, decreased appetite, nausea, urinary tract infection, fever (pyrexia) and constipation. Tecentriq also has the potential to cause infection and serious side effects that result from the immune system effect of Tecentriq (known as “immune-mediated side effects”). These severe immune-mediated side effects involve healthy organs, including the lung, colon and endocrine system. [Source-FDA]

## Innovation in Cell Culture Technology: Rethinking New Possibilities

**R**esearch Use Only (RUO) Cell Expansion Set R17 is a cell culture facility designed for use in Quantum system providing significant advantage in comparison to manual flask-based method. The advantages involve in test variables with the reduction in the risk of contamination as well as the need for a clean room by implementing a functionally closed system in order to complete research on scalable and reproducible device. The bioreactor contains hollow fiber having a surface area of 1.7m<sup>2</sup> and consumes minimal amount of space ideal to be used in commercial purpose where space can be bigger constraint to comply. The system have the opportunity of customization to predefined setting

involving cell seeding, reagent addition, feeding and harvest allowing replication of manual cell culture including mesenchymal stem cells (MSC) and fibroblast within a short period of 20 minutes. The additional advantages include manipulation of cell culture environment involving temperature controls or gas-blend connections of wide varieties of range, cell feeding and waste removal configured as per users' requirement. The key attribute and success of the technique involves its degree of reproducibility providing defined and stable geometry minimizing the risk of operator error like failure or contamination due to the level of hands-on attention requirement. – Samin Huq <https://www.terumobct.com>

