

A Potential Cause of Childhood Allergies CANADA | August 2023

A new study led by researchers at the University of British Columbia and the British Columbia Children's Hospital has found that delayed maturation of gut bacteria within the first year of life may be a key indicator of pediatric allergic disease diagnoses by the age of five.¹ The researchers observed that common allergic diagnoses were consistently associated with depletions in the bacteria *A. hadrus*, *F. saccharivorans*, *E. hallii*, and *B. wexlerae* in infants' stool samples.¹ Additionally, the researchers observed that enrichments in the bacteria *E. lenta*, *C. innocuum*, *E. faecalis*, *E. coli*, and *T. nexilis* were correlated with allergic diagnoses.¹ These imbalances in the gut microbiota resulted in a weakened intestinal lining and increased inflammatory response and can be a significant factor to predisposing children to allergies within the first five years of life.¹

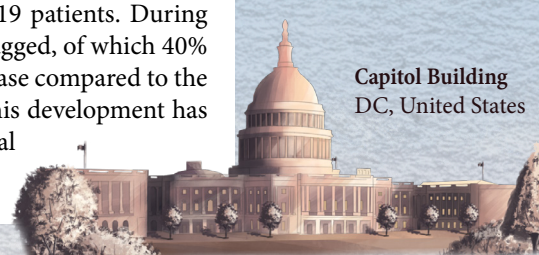
CN Tower
Toronto, Canada



Sepsis Detection using Artificial Intelligence UNITED STATES | July 2022

Johns Hopkins University has recently developed an analytical system guided by artificial intelligence (AI) to detect early signs of sepsis.² Sepsis is a condition that can develop from bacterial infections. Progression may result in septic shock, a drastic drop in blood pressure, which has a mortality rate of around 50%.³ Based on clinical data, this AI model may reduce mortality rates by up to 20%. The model was first used to retrospectively screen 173,931 patients and subsequently deployed for 469,419 patients. During the deployment phase, 82% of patients were flagged, of which 40% were confirmed sepsis cases, a significant increase compared to the 2-5% accuracy of existing diagnostic tools.⁴ This development has the potential to save thousands of lives in clinical settings.⁴

Capitol Building
DC, United States



Reports on HIV and Sexual Reproductive Health Services in Zimbabwe ZIMBABWE | September 2023

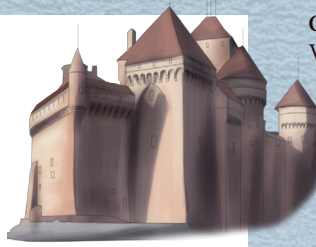
There are significant socioeconomic and political barriers to accessing sexual and reproductive health (SRH) related care in Zimbabwe.⁵ In 2020, various initiatives were undertaken to improve services and care related to SRH.⁶ These interventions include counseling in general health and risk reduction, increased HIV screening, and delivery of antiretroviral therapy.⁷ Screening for STIs has increased from around 2,730 screens per year to 16,298 screens between 2020 and 2022. Additionally, treatment was made available for those who tested positive. For those who tested negative, 2,114 qualified for pre-exposure prophylaxis, and a total of 2,010 HIV self-testing kits were distributed. To continually observe these improvements, the Government of Zimbabwe plans to open more sites and increase the capacity for care to improve the SRH of its people.⁶

Victoria Falls Bridge
Victoria Falls, Zimbabwe



The Discovery of a New Organelle
SWITZERLAND | September 2023

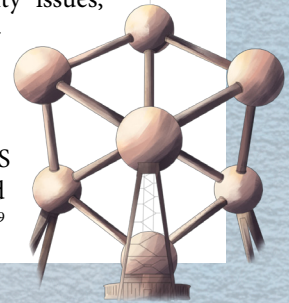
Researchers at ETH Zürich have discovered a new organelle in mammalian cells called the exclusome, which stores DNA rings called plasmids.⁸ In typical eukaryotic cells, DNA is stored in the nucleus. However, in certain cancer cells, plasmids that do not code for proteins are pinched off, sent out of the nucleus and stored in the exclusome alongside extracellular plasmids.⁸ By maintaining cell organization, the exclusome helps prevent potential disruptions to the overall functioning of the cell.⁸ Current research suggests that the exclusome may be an evolutionary precursor to the cell nucleus, potentially offering insights into the cellular evolution of eukaryotes.⁸



Chillon Castle
 Vevytau, Switzerland

Paper Straws May be More Harmful than Plastic Straws
BELGIUM | August 2023

A new study conducted at the University of Antwerp tested for the presence of perfluoroalkyl substances (PFAS) in straws made from paper, bamboo, stainless steel, plastic, and glass.⁹ Thirty-nine straw brands were examined, and PFAS were found in almost all types, with plant-based materials containing higher concentrations.⁹ PFAS may be consumed by drinking through such straws and bioaccumulate.¹⁰ In high concentrations, PFAS may cause liver damage, thyroid disease, fertility issues, and cancer.¹⁰ Despite the eco-friendly appeal and recent social movements to adopt sustainable single-use food products, the high concentrations of PFAS raise concerns about increased exposure to harmful pollutants.⁹



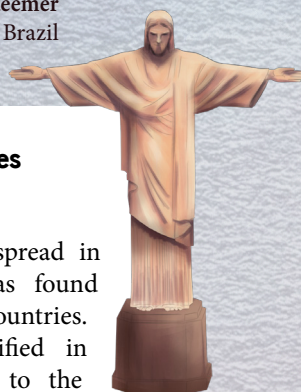
The Atomium
 Brussels, Belgium



Christ the Redeemer
 Rio de Janeiro, Brazil

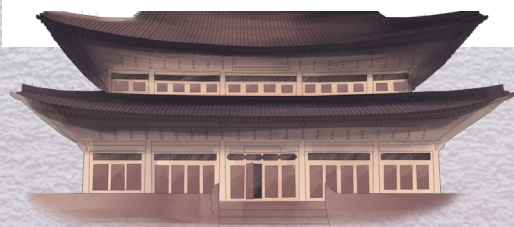
Avian Influenza in South American Countries
BRAZIL | MARCH 2023

In May 2022, bird flu (H5N1) started to spread in North and South America. The virus was found to infect birds and mammals across 16 countries. Human cases of H5N1 were first identified in Ecuador in January 2023. As a response to the outbreak, the Pan American Health Organization gathered in Rio de Janeiro and discussed methods to halt the spread of H5N1.¹³ One suggested precaution was to improve biosecurity in animal facilities, where the virus can circulate easily. In addition, veterinary authorities were advised to educate those working near sources of infection.¹⁴



Microbial Cell Factories for Sustainability
SOUTH KOREA | July 2023

Researchers at the Korea Advanced Institute of Science & Technology have been exploring the possibility of using microorganisms to produce food and cosmetic compounds.¹¹ Modifying the genetic material of a microorganism can produce desired novel compounds.¹² Currently, many synthetically-derived compounds, such as fructose, vanillin, and salicylic acid, require the use of extensive resources and create large carbon and water footprints. In contrast, microorganisms create much smaller footprints while requiring a fraction of the land to operate. This advancement could alleviate much of the environmental stress caused by large industries and provide a more sustainable alternative to conventional production techniques.¹¹



Gyeongbokgung Palace
 Seoul, South Korea