

The Webscout

SECTION EDITOR



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Vaccines and immunotherapies

The first practice of immunisation in western countries dates back as far as 1796 when Eduard Jenner used cowpox to vaccinate a young boy against smallpox. This was soon followed by the first smallpox vaccine in 1798.

History of vaccines

An impressive summary of history of vaccines and infectious diseases can be found at <http://www.historyofvaccines.org/>, one of the few websites that have been certified by the World Health Organization. This well-organised website also includes information about how vaccines work and how they are developed and manufactured, plus an animated activity tool.

CDC website

The Centers for Disease Control and Prevention (CDC) is the leading public health institute in the US, and valuable information about current vaccines. The CDC also provides a frequently updated summary of the annual morbidity of vaccine-preventable diseases. The most recent can be found at <https://www.cdc.gov/vaccines/ed/surv/downloads/VPD-morbidity-slide1-mmwr-508.pdf>. Detailed information about the benefits and risks of vaccines are provided in Vaccine Information Statements, which can be found at <http://www.cdc.gov/vaccines/hcp/vis/current-vis.html>.

WHO website

The WHO provides the most comprehensive summary of information required for assuring vaccine quality and safety (<http://www.who.int/immunization/en>). This includes current guidelines, international consensus on safety and quality issues, and technical advice to national regulatory authorities.

Vaccine Adverse Event Reporting System

Because vaccines are intended for preventing disease in healthy people, comprehensive safety studies, intensive review of spontaneously occurring cases, and large epidemiological studies are needed. The Vaccine Adverse Event Reporting System, co-managed by the CDC and the FDA and available as an online tool at <https://vaers.hhs.gov/data.html>, collects post-marketing surveillance data on adverse events.



Currently, the system receives around 30,000 reports each year. The website also includes current and archived flu updates for healthcare professionals.

ECDC website

The European Centre for Disease Prevention and Control (ECDC) (<http://ecdc.europa.eu/en>) was established after the outbreak of SARS in 2003 to strengthen Europe's defences against infectious diseases.

EMA website

The regulatory framework for producing and using vaccines in the EU is provided by the EMA. Their website is at <http://www.ema.europa.eu/>.

Open access article on the history of immunotherapy

Immunotherapies harness the body's own immune system to target and attack a disease. William Coley first attempted to harness the immune system for treating cancer in the late 19th century. In 1891, he injected a mixture of live and inactivated bacteria into patients' tumours and achieved complete remission of several types of malignancies. Cancer treatment

is currently a main focus of immunotherapy research. An informative timeline, with key events in the development of currently marketed immunotherapies is available in an open access article by Morrissey and colleagues at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC5351311/>. The article explains that immunotherapies can be divided into two main types: "active", where the immunotherapy engages the host's immune response, and "passive", where the therapeutic agent directly neutralises the target and does not induce an immune response.

YouTube video on anti-cancer immunotherapy by checkpoint inhibition

In 2013, the editors of *Science* chose active immunotherapies as the breakthrough of the year. In a video produced by the *Wall Street Journal*, available at <http://www.youtube.com/watch?v=ySG2AwpsZmw>, Dr James Allison, explains how CTL-4 blockade, also known as checkpoint inhibition, can enhance anti-tumour immunity and be used to fight against cancer. A text version is available at <http://crl.berkeley.edu/discoveries/the-story-of-yervoy-ipilimumab/>.

US NCI website on cancer vaccines

As described in a factsheet on the NCI website (<http://www.cancer.gov/about-cancer/causes-prevention/vaccines-fact-sheet>), cancer vaccines can be further subdivided in preventive and therapeutic types. Preventive vaccines are given to healthy individuals to keep certain cancers from developing, whereas therapeutic vaccines are given to cancer patients to reduce their existing tumours by boosting the immune system.

Cancer Research UK immunotherapy website

Cancer Research UK has a unique searchable database of all clinical trials in the UK. Their website also includes detailed information on “What is immunotherapy?” and “Types of cancer immunotherapy” at <http://about-cancer.cancerresearchuk.org/about-cancer/cancer-in-general/treatment/immunotherapy>.

Marketing authorisation of cancer immunotherapies

In the EU, marketing authorisation for cancer immunotherapies follow the centralised procedure, which is described at http://www.ema.europa.eu/ema/index.jsp?curl=pages/about_us/general/general_content_000109.jsp&mid=WC0b01ac0580028a47.

Cancer Drug Development Forum

There are many challenges to attaining approval and bringing cancer immunotherapies into clinical practice. The Cancer Drug Development Forum (<http://cddf.org/>) is a platform for experts from academia, oncologists, policy makers, representatives from health-technology-assessment bodies, the pharmaceutical industry, regulatory bodies, and patient organisations that works together with the EMA to aid in developing cancer drugs, including immunotherapies.

National Comprehensive Cancer Network

For the US market, the National Comprehensive Cancer Network (www.nccn.org/professionals/physician_gls/default.aspx) is a useful source for information on immunotherapy cancer treatment, including all kinds of guidelines.

Cancer.net

Cancer.net provides information from the American Society of Clinical Oncology, with support from the Conquer Cancer Foundation, to people living with cancer and those who care for and about them to help patients and families make informed health care decisions. The cancer.net website (www.cancer.net/navigating-cancer-care/how-cancer-treated/immunotherapy-and-vaccines) explains how cancer vaccines and immunotherapies work and provides links to clinical trials and details about reported side effects.

CNN podcast on cancer immunotherapies

In a recent podcast (<http://edition.cnn.com/2017/06/02/health/immunotherapy-cancer-debate-explainer/index.html>), CNN reports that there is “hope and hype” around cancer immunotherapies. They explain that immunotherapies are becoming a critical component of cancer care, especially in combination with standard treatments, and that they will be the main focus for cancer treatment over the next 5 years.

Did you like this Webscout article? Do you have any questions or suggestions? Please feel free to get in touch and share your thoughts.

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