

News from here and there

Decades-long suppression: Bloomberg report uncovers cancer risks of Zantac (ranitidine)

On 15 February 2023, *Bloomberg Businessweek* revealed that a world-renowned pharmaceutical company was able to successfully suppress for nearly 40 years the fact that its popular heartburn medication, Zantac (ranitidine), had traces of a potential carcinogen, N-Nitrosodimethylamine (NDMA). The report is available at this link: www.bloomberg.com/news/features/2023-02-15/zantac-cancer-risk-data-was-kept-quiet-by-manufacturer-glaxo-for-40-years?sref=XGjS8839&leadSource=verify%20wall#xj4y7vzkg.

The report by *Bloomberg Businessweek* was based on extensive research of hundreds of documents containing thousands of pages, including sealed documents, US court filings, transcripts of the U.S. Food and Drug Administration (US FDA), and new drug applications. According to the report, both scientists of the company as well as independent researchers continually warned the management about the presence of a potential cancer-causing impurity, N-Nitrosodimethylamine (NDMA), in Zantac. NDMA is a member of the nitrosamine group of chemicals that was previously a component of rocket fuel. Nowadays, NDMA is used in research laboratories for inducing cancer in rats.

The company did not disclose this vital information to either the regulatory authorities or to the public. Further, they supported flawed research that downplayed the risks associated with Zantac. Moreover, certain changes in the supply chain or storage procedures that could have mitigated the issue were not implemented.

However, in 2019, the medication and its generic counterparts were shown to have elevated levels of NDMA. This discovery was based on the investigations of Valisure, an independent laboratory in New Haven, Connecticut, USA. The discovery led to increasing concerns about the safety of the Zantac. The US FDA then did their own research. The US FDA has noted that NDMA levels can increase even when storage conditions of the drug are normal. In presence of higher temperatures, NDMA levels increase.

By 2020, Zantac was completely removed from the US market. Similar decisions have been taken by other regulatory agencies across the world. In the USA, over 70 000 individuals who have either used Zantac or its generic versions seek justice and have initiated appropriate legal action.

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Link proposed between increased air pollution and depression-anxiety

Researchers have suggested, in a paper published in the February 2023 issue of *JAMA Psychiatry* (2023;80:305–13. doi: 10.1001/jamapsychiatry.2022.4812) that there is an increased risk of psychiatric disorders in individuals exposed to chronically polluted air. The authors were Teng Yang, Jiawei Wang and Jing

Huang (all from Beijing, China), Frank Kelly (London, England) and Guoxing Li (Beijing, China and London, England). The study, which used a prospective population-based cohort model, was conducted across 5 years in UK and enrolled over 380 000 participants. All the subjects had no prior symptoms or diagnoses of anxiety or depression. Particle pollutants in air (dirt, dust, soot and smoke), nitrogen dioxide and nitrogen oxides were monitored as the recordable agents that caused psychiatric ailments. Traffic-related combustion byproducts, burning of coal and natural gas, agriculture, unpaved roads, construction sites and wildfires were all identified as sources of generation of air pollutants. The smallest particulate matter included was PM_{2.5} with average aerodynamic diameters of the pollutants studied being between 2.5 µm and 10 µm.

In the study, 13 131 subjects were diagnosed with depression and a further 15 835 with anxiety. The smallest air pollutants were found to lodge in the respiratory tract and travel to the brain, causing inflammation and changes across the blood–brain barrier. Men were more likely to be affected with chronic air pollution exposure than women; both depression and anxiety displayed non-linear exposure-response curves to long term exposure to multiple air pollutants across a median follow-up of 10.9 years.

The implications of such findings are obvious. The researchers hoped that lawmakers in UK and elsewhere would propose more effective laws to expand green covers for heavily populated areas and highly polluted air zones.

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Infosys Prize 2022 in life sciences awarded to neuroscience researcher Vidita Vaidya

The Infosys Prize 2022 in Life Sciences was awarded to Vidita Vaidya, Professor and Chairperson, Department of Biological Sciences, Tata Institute of Fundamental Research, Mumbai. Professor Vaidya's research had focused on the signals engaged by serotonin in the causation of persistent changes in behaviour brought about by stress in early life and the importance of serotonin in energy production in brain cells. This area of research has importance in widening the understanding of the ageing brain. The prize was awarded recognizing the impact her work had on understanding brain mechanisms that underlie mood disorders such as anxiety and depression. In the present times, when the importance of mental health is increasingly being recognized, Dr Vaidya's work has major importance. In an emailed message to this correspondent, Dr Vaidya stated, 'One of the discoveries for which we received the prize is our finding that serotonin enhances both the production of mitochondria and their function, whilst at the same time buffering oxidative damage and protecting neuronal cells. This work has implications for both neuropsychiatric and neurodegenerative disorders.'

The prize has been instituted by the Infosys Science Foundation (ISF) and has been awarded annually since 2008

and celebrates the contributions of Indians in research. The award consists of a gold medal, a citation, and a prize purse of US\$ 100 000. The prize distribution ceremony was held in Bengaluru, Karnataka, on 7 January 2023, to the winners for their contributions to research. The Chief Guest for the function was Professor Shafi Goldwasser, Turing Award laureate and Director, Simons Institute for the Theory of Computing, UC Berkeley, USA. The jury chair for life sciences was Professor Mriganka Sur (Director, Simons Center for the Social Brain, Massachusetts Institute of Technology, USA).

The other areas (and researchers) that were recognized are

Engineering and Computer Science (Suman Chakraborty, Indian Institute of Technology, Kharagpur); Humanities (Sudhir Krishnaswamy, National Law School of India University, Bengaluru); Mathematical Sciences (Mahesh Kakde, Indian Institute of Science, Bengaluru); Physical Sciences (Nissim Kanekar, National Centre for Radio Astronomy, Pune); and Social Sciences (Rohini Pande, Yale University, Connecticut, USA).

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