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Electronic nose for cancer detection

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Cancer is one of the fastest-growing diseases, which can be fatal if not diagnosed and treated at the right time. Different technologies are being researched for an effective diagnostic tool that could detect tumour cells and thereby eradicate them in the first place. One such innovation is the electronic nose technology that has moved the oncology field since its advent. Electronic olfaction (e-nose) is an odour-based technology which can help in diagnosing different types of cancers, ranging from lung cancer to ovarian cancer. It works on a principle similar to that of mammalian olfaction, through the use of artificial sensors. It uses both machine learning and artificial intelligence to mimic the biological process. Humans are capable of deciphering the components or ingredients by sniffing or breathing in the aroma. E-noses mimic these mammalian sensory skills and interpret the mixture. All cells, upon cell division, liberate certain compounds called volatile organic compounds (VOC), which are taken into the bloodstream. The VOCs emitted from the cells in the plasma samples are different for normal and cancerous cells. The e-nose technology, equipped with nanosensors, utilises this distinction and helps in the early detection of cancer cells. It can even differentiate between different cancer cells. Electronic nose technology can help in detecting the presence of cancer, at the earliest as well as advanced stages. Besides being user-friendly, it is also cost-effective as the test can be done with blood drawn from the patient. It is a promising tool that has the potential to bring huge advancements in the field of oncology.

Keywords: Electronic nose, Cancer detection, Olfaction, Volatile organic compounds, Nanosensors

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