

Breath Print

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In News

Our breath may be as unique as our fingerprint. Compounds in exhaled air produce a unique and stable molecular autograph or “breathprint” – one that could be **used to monitor disease or track response to medication.** Our genomes are unique, our epigenomes are unique, our microbiomes are unique, so it is not surprising our breath metabolomes are also unique. What is important is **how they vary from individual to individual and how they differ in relation to development of disease or in response to therapy.**

More About Breath Print

- Human breath contains a number of **volatile organic compounds (VOCs).** Accurate detection of specific VOCs in exhaled breath can **provide essential information for the early diagnosis of diseases.**
- For example, acetone, H₂S, ammonia, and toluene can be used to evaluate diabetes, halitosis, kidney malfunction, and lung cancer, respectively.
- VOCs **originate from the molecular exchange between lung tissue and blood.**
- Further, our **gastrointestinal (GI) track plays a crucial role in water metabolism** in the body. Water exists in nature as four isotopes. It is believed that **any kind of impaired or unusual water absorption in our GI tract may be associated with various gastric disorders or abnormalities** like ulcer, gastritis, erosions and inflammation. But so far there has been no clear experimental evidence to support this.
- The **non-invasive diagnosis** of various diseases is the key advantage of exhaled breath analysis techniques over other commonly used methods.

- The use of **multi-sensor arrays with nanostructured semiconductor metal oxides** is essential for developing inexpensive and simple diagnostic tools for examining the concentration of VOCs in exhaled breath.
- The sensor arrays are advantageous in terms of **gas adsorption**, leading to **large resistance changes** achieved by high specific surface area and porous nanostructure.