

Simple blood test may allow for early detection of oral cancer

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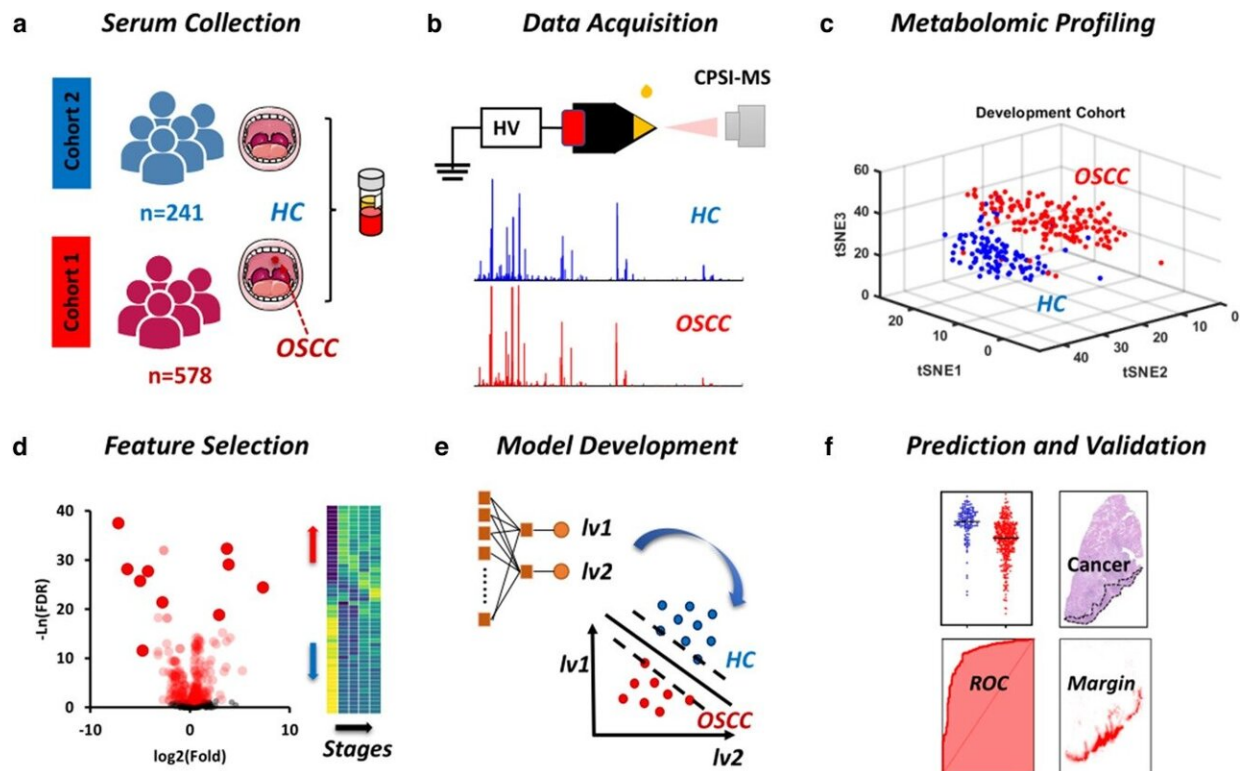


Diagram of the serum metabolic profiling workflow by CPSI-MS/ML. (a) Two cohorts of serum samples were collected from the OSCC and HC volunteers as the marker discovery and validation sets, respectively. (b) One drop of dried serum spot (3 μ L) was loaded onto a conductive polymer tip. Once the extraction solvent was spiked, the high voltage was switched on to trigger the data acquisition. (c) The high-dimension metabolic profiles of different groups were classified and visualized under the constructed 3D features space by an unsupervised machine learning model; (d) From a statistical analysis, the discriminating metabolites were selected as features. (e) Given the data of the

two cohorts as the training and test sets, a machine learning model was applied; (f) The serum metabolite markers were further validated at the tissue level and the combination was employed as the diagnostic panel. tSNE, t-distributed stochastic neighbor embedding; Ln(FDR), natural logarithm of false discovery rate; Lv, latent variable. Credit: *Natural Sciences* (2021). DOI: 10.1002/ntls.20210071

The current 60% five-year survival rate of individuals with oral squamous cell carcinoma (OSCC)—a type of cancer of the mouth and throat—could be greatly improved if treatments were initiated as early as possible. In a study published in *Natural Sciences*, researchers used a technology called conductive polymer spray ionization mass spectrometry to screen the blood for metabolic signs of OSCC. The method could accurately distinguish between individuals with and without OSCC.

Also, two altered lipid markers that were discovered in the blood could be traced back to the cancer site for guiding surgical margin assessments.

The method—which requires only a single drop of blood—could also distinguish between patients with early versus later stages of OSCC.

"This study represents the fruits of research involving the United States and China, in which all the participants believed that the results would be a win for both countries and for the world as a whole, an idea that seems alas to be disappearing in these times of mutual suspicion and distrust of international collaborations," said co-corresponding author Richard N, Zare, Ph.D., of Stanford University.

The author of an accompanying Research Highlight noted that the study "is a perfect showcase for how [mass spectrometry](#)-based metabolomics

workflows can be simplified to make them usable in clinical applications."

More information: Xihu Yang et al, Big cohort metabolomic profiling of serum for oral squamous cell carcinoma screening and diagnosis, *Natural Sciences* (2021). [DOI: 10.1002/ntls.20210071](https://doi.org/10.1002/ntls.20210071)

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