

Unique lipid profile could help diagnose and treat lung cancer

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The lipid contents of a fluid that surrounds the lungs in some diseases contains specific fats that could be used as a biomarker to distinguish people with and without lung cancer. It can also identify a subtype of the cancer that needs to be treated with drugs that are different from those used in other types of the disease.

Lung [cancer](#) is the leading cause of cancer-related deaths worldwide. Its predominant form, called non-small cell [lung cancer](#) (NSCLC), represents more than 85 per cent of cases and is usually diagnosed by examining cells from a [lung biopsy](#). But sometimes biopsies don't contain enough cells for diagnosis. "In the event of insufficient cancer specimens, a false-negative finding might indicate the absence of cancer which would be incorrect," explains Ying Swan Ho of A*STAR's Bioprocessing Technology Institute. "This could result in a lung cancer patient walking out of the hospital without receiving the appropriate treatment."

Ho and a team of colleagues in Singapore examined the contents of 'pleural effusion' removed from 30 people who did not have lung cancer and 41 people who did. Pleural effusion accumulates around the lungs in up to 30 per cent of people with lung cancer. It also can be found in people with tuberculosis, pneumonia and other lung conditions.

The team found two [polyunsaturated fatty acids](#) in pleural effusion that were each highly sensitive and specific for NSCLC. Looking for either fatty acids in a pleural effusion sample distinguished between people

with and without the disease.

There were also differences in the levels of seven lipids found in the pleural effusions of NSCLC cases who had a mutation in a gene called EGFR compared to cases without the mutation. Lung cancer patients with EGFR mutations respond better to a specific targeted anti-cancer treatment than they do to standard chemotherapies. Identifying them early could help provide them with more effective treatment.

"Upon further validation, we think that quantifying the levels of lipids can potentially complement traditional approaches in cancer diagnosis, particularly when cancer cells and tissues are limited or unavailable," says Ho.

Next the team plans to examine a larger number of people to validate their study's results and also to determine the levels of lipids, when found, that can accurately detect the disease and its subtype. They are also currently investigating the roles of lipids in the development of [lung](#) cancer.

More information: Ying Swan Ho et al. Lipidomic Profiling of Lung Pleural Effusion Identifies Unique Metabotype for EGFR Mutants in Non-Small Cell Lung Cancer, *Scientific Reports* (2016). [DOI: 10.1038/srep35110](https://doi.org/10.1038/srep35110)

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