Estrobolome disparities may lead to developing biomarkers that could mitigate cancer risk

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Investigating disparities in the composition of the estrobolome, the gut bacterial genes capable of metabolizing estrogens in both healthy individuals and in women diagnosed with estrogen-driven breast cancer may lead to the development of microbiome-based biomarkers that could help mitigate the risk of certain cancers, according to a review paper published April 22 in the *JNCI: Journal of the National Cancer Institute*.

Residential microbes, such as bacteria and viruses, are known to play important roles in health and disease. The human gastrointestinal (GI) tract contains over 1,000 bacterial cells per gram of luminal content, and is known to help protect humans from developing disease. However, the function of the GI tract can become volatile, and thus may contribute to the development of disease. Gut microbes can influence systemic estrogen levels as they contain enzymes such as glucuronidase which render estrogens reabsorbable. Therefore, modulation of the estrobolome may be helpful in protecting the body from disease and could help lower the risk of getting cancer.

To determine the effects that estrobolome may have on estrogen levels and human breast cancers, Sylvia Adams, M.D., from the Laura and Isaac Perlmutter Cancer Center, New York University Langone Medical Center, and colleagues are currently conducting a study comparing microbiota between postmenopausal healthy women and patients who have developed estrogen-driven cancers.

The researchers believe that, "If the estrogen metabolism-gut microbiome axis is functional with underlying individual variations in estrogen levels, it is plausible that the estrobolome could contribute to the risk of hormone-driven malignancies including breast cancer and as such could serve as a potential biomarker," adding that "interventions that may include use of prebiotics, probiotics, or antimicrobial agents could be designed specifically to target gut bacterial species with b-glucuronidase activity to decrease estrogen-related cancer risk or become components of future therapies. In conclusion, links between the microbiome and estrogen-driven breast cancer are growing, and we hope that research will identify specific characteristics of the gut microbiome that can be used to develop novel approaches for breast cancer risk assessment, prevention, and treatment."

More information: *JNCI: Journal of the National Cancer Institute*, DOI: 10.1093/jnci/djw029

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