INVESTIGATION OF VOLATILOMIC SIGNATURES OF COLORECTAL TISSUES TOWARDS IDENTIFICATION OF POTENTIAL NON-INVASIVE BIOMARKERS FOR COLORECTAL CANCER

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Analysis of 50 paired colorectal tissue samples identified four volatile organic compounds—1-propanol, pyridine, isoprene, and methyl thiolacetate—as promising biomarker candidates for detecting colorectal cancer.

KEY POINTS

- Gas chromatography-mass spectrometry analysis of tissue headspace revealed 163 total volatile compounds, with 149 in cancerous tissue and 147 in non-cancerous tissue, of which 138 were common to both types.
- Fifteen VOCs showed statistically significant concentration differences between cancer and normal tissue, with four compounds elevated in cancer tissue and eleven reduced.
- The four compounds with significantly increased emissions from cancerous tissue were 1-propanol, pyridine, isoprene, and methyl thiolacetate ($p<0.05$), representing the most promising biomarker candidates.
- Hydrocarbons and alcohols were the predominant chemical classes in both tissue types, accounting for 25% and 15% respectively, followed by aldehydes, ketones, and aromatics.
- This study may be relevant to researchers investigating non-invasive diagnostic approaches for colorectal cancer detection based on volatile metabolite profiling.

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