

RAMAN SPECTROSCOPY FOR DIAGNOSIS OF GASTRIC DYSPLASIA AND GASTRIC CANCER WITH BIOMARKER CORRELATIONS – A MACHINE LEARNING MODEL

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Poster

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A machine learning model using Raman spectroscopy achieved 76.9% accuracy in differentiating high-risk gastric lesions (dysplasia and early cancer) from low-risk lesions (intestinal metaplasia and gastritis) in a prospective study of 20 participants.

KEY POINTS

- The study prospectively collected 1961 Raman spectra from 33 gastric lesions in 20 participants recruited from April 2022 to July 2023, correlating spectra with histopathology
- For high-risk versus low-risk lesion differentiation, the XGBoost model using 192 overlapping wavenumbers achieved 76.9% accuracy and F1 score of 0.84, with wavenumbers correlated to biochemicals including lipids, proteins, phospholipids and leucine
- For differentiating low-grade dysplasia from intestinal metaplasia, the model using 100 wavenumbers achieved 74.7% accuracy and F1 score of 0.80 with leave-one-out cross-validation
- The authors conclude that a Raman spectroscopy-based AI algorithm may be useful for real-time diagnosis of gastric intestinal metaplasia, dysplasia and early gastric cancer

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