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Summary

PLASMA PROTEOMIC PROFILES IDENTIFY BIOMARKERS PREDICTING CROHN'S DISEASE UP TO 16 YEARS BEFORE ONSET

Hao Chen

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Machine learning models using plasma proteins predicted future Crohn's disease onset up to 16 years in advance in UK Biobank and Southern China cohorts.

KEY POINTS

- Among 2,736 proteins analyzed in 39,634 UK Biobank participants without baseline Crohn's disease, 44 were significantly associated with incident disease, with CD274, CHI3L1, REG1B, ITGAV, PRSS8, ITGA11, GDF15, DEFA1_DEFA1B, and IL6 ranking as the top 9.
- The XGBoost protein model achieved AUC 0.76 in a geographically distinct UK Biobank validation cohort and AUC 0.79 in an external Southern China cohort, outperforming clinical risk models (highest AUC 0.67, $P < 0.05$) and the existing PREDICTS model (AUC 0.68, $P < 0.05$).
- Combining the nine proteins with clinical data enabled predictions up to 16 years pre-diagnosis with AUC 0.78, and individuals in the high-risk group were 4.23 times more likely to develop Crohn's disease.
- This proteomics-based approach may help identify individuals at high risk for Crohn's disease for potential early intervention evaluation.

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