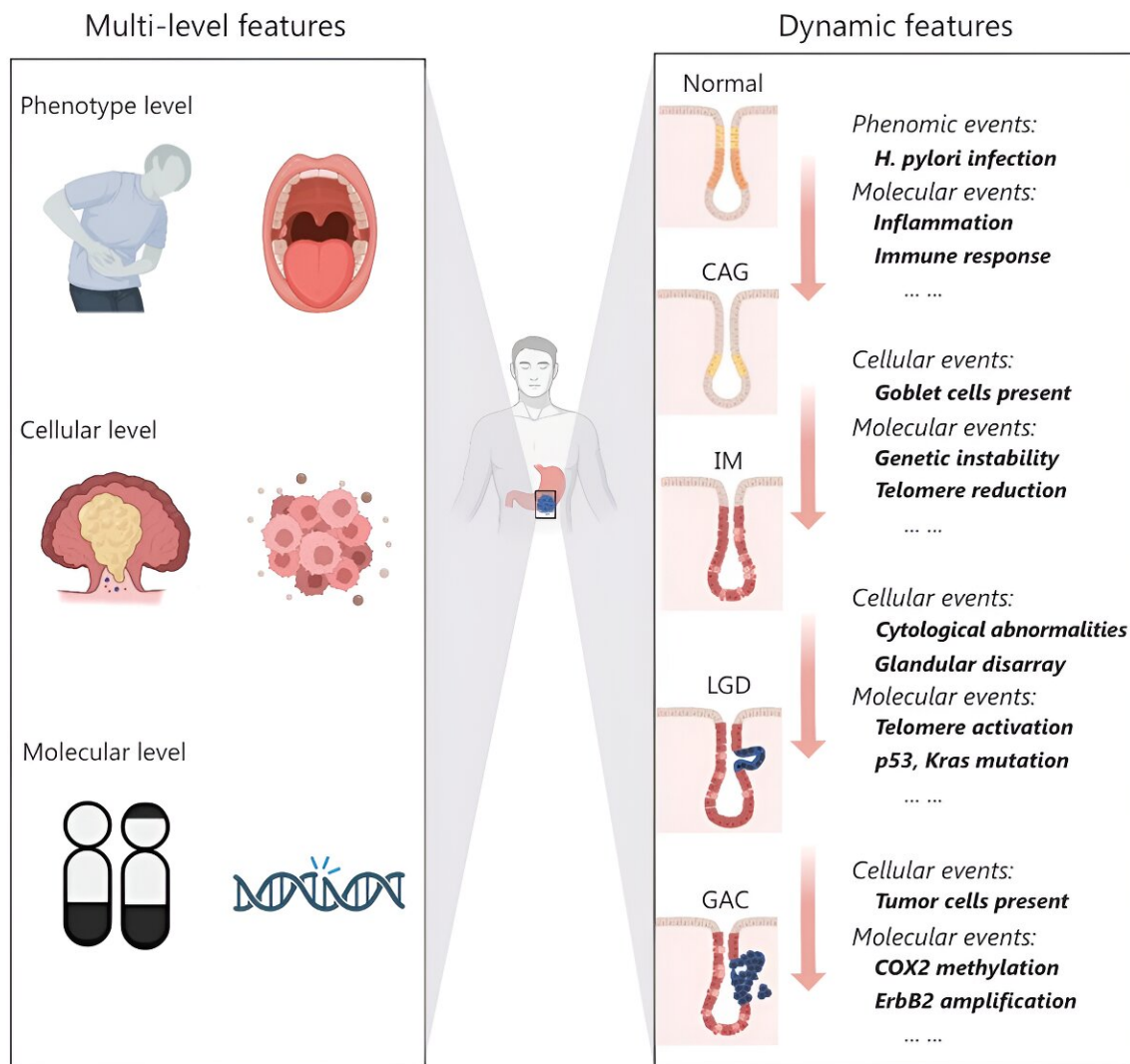# Deciphering inflammation-induced tumorigenesis: Unveiling gastric cancer's trail with network and AI

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Characteristics of gastric inflammation-induced tumorigenesis. CAG: chronic atrophic gastritis, IM: intestinal metaplasia, LGD: low-grade dysplasia, GAC: gastric adenocarcinoma. Credit: *Cancer Biology & Medicine* (2023). DOI: 10.20892/j.issn.2095-3941.2023.0129

In a pioneering venture, researchers have harnessed AI and multi-omics to shed light on the intricate pathways of gastric inflammation-induced tumorigenesis. This study heralds a new era in early detection and personalized medicine, identifying key biological triggers of tumorigenesis and laying down a robust framework for innovative gastric cancer therapies.

Gastric cancer, a significant global health challenge, is characterized by a complex transition from inflammation-induced premalignant lesions to malignancy. The quest for early diagnosis and prevention is impeded by the intricate biological shifts that mark this journey, highlighting an urgent need for a deeper dive into the underlying the multi-level and dynamic features.

From the Institute for TCM-X at Tsinghua University, a team of scientists has unveiled a pivotal review in the field of gastric cancer research. Published in *Cancer Biology & Medicine*, the study employs AI and multi-omics to map the trajectory of gastric cancer development, offering an in-depth and holistic perspective on the disease's evolution.

This study meticulously dissects the complex interplay of biological factors in the onset of gastric cancer from inflammation. By fusing multimodal and multi-omics data with sophisticated AI, the researchers have identified a plethora of crucial biomarkers and potential intervention targets. The integration of single-cell transcriptomics offers detailed cellular insights, while network-based algorithms unveil the

intricate molecular interconnections.

A standout discovery for early biomarkers of gastric cancer is the pinpointing of critical cellular milestones that signal the transition to cancer, enhancing our ability to diagnose and treat gastric cancer with precision. The insights gleaned from this study can bolster our understanding of the disease's progression and set a foundation for more effective diagnostics and therapeutics.

Professor Shao Li, member of EASA (European Academy of Sciences and Arts), spearheading the research, underscores its impact: "Our integrative methodology profoundly advances our comprehension of gastric cancer, pioneering the way for early detection biomarkers and targeted treatment strategies that are essential for advancing cancer care."

Collectively, the researchers believe that holistic observation of the malignant transformation from premalignant lesions, followed by the identification of critical time points and characteristics, as well as implementation of systematic interventions, would embody the essence of refining cancer prevention strategies. The study's profound implications suggest a future where gastric cancer management is characterized by precision and tailored treatment plans, enhancing patient outcomes and therapeutic success.

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