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Case ID:M20-058LC^
Published: 6/25/2020

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Novel Antibodies for Detecting Gastric Cancer

Gastric cancer (GC) is a major public health problem in many countries, with more than 1 million new cases, worldwide, in 2018, contributing to almost 800,000 deaths. And new research suggests that GC may be on the rise in the US, particularly among younger adults. Early detection of GC often allows for greater therapeutic options, however, because routine screening is not common, most people are diagnosed at a more advanced stage with limited treatment options.

It is widely known that chronic infections with Helicobacter pylori (H. pylori) are a key risk factor for gastric cancer (GC). While H. pylori infection is common, progression to GC is rare, and it isn't well understood why only some infected individuals develop this neoplasia. A better understanding of this relationship could help stratify patients who are at risk of developing GC.

Researchers at the Biodesign Institute of Arizona State University have developed a panel of antibodies for identifying patients which may either be at risk of developing, or already have gastric cancer. Using nucleic acid programmable protein arrays (NAPPA), a comprehensive assessment of humoral immunoproteomic profiles of H. pylori in GC was performed. Immunodominant proteins were discovered and several antibodies were identified, some of which may actively contribute to carcinogenesis while the absence of others may contribute to carcinogenesis. Further, proteins targeted by the antibodies may represent novel H. pylori or GC candidate vaccines.

This antibody panel, and the specific associations with GC may help stratify patients into high or low risk categories and even help in the early diagnosis or treatment of GC.

Potential Applications

- Identifying patients at risk of developing gastric cancer
- Diagnosis of gastric cancer
- Diagnosis of H. pylori infection
- Vaccines for gastric cancer
- Vaccines for H. pylori infections

Benefits and Advantages

- Seronegativity for certain antibodies was associated with a 2- to 8- fold increase in GC risk
- Could detect GC even in the absence of symptoms
- The antibody panel was well validated by a stringent two-step ELISA that included verification and blinded testing on an independent sample set
- Well characterized samples with high and similar prevalence of H. pylori infection in both GC case and control groups were tested
- 91% of the full H. pylori bacterial proteome was analyzed
- Discovery set included 50 GC patients and 50 controls and validation set included 100 GC patients and 100 controls

For more information about this opportunity, please see

Song et al - AGA Abstracts - 2018

For more information about the inventor(s) and their research, please see

Dr. LaBaer's departmental webpage