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Cytotoxic and Genotoxic Effects of Patient-derived Plasma on Healthy and Cancer-derived Cell Lines

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Genome instability and mutation drive carcinogenesis. Many everyday factors can have adverse effects on the genome. Monitoring the mutational effects of plasma and serum derived from patients diagnosed with: GORD, Barrett's oesophagus, and upper GI cancer can reveal and ultimately predict future cancer risk. For this study, plasma was isolated from healthy volunteers and non-cancer patients attending the local endoscopy department and cancer patients attending the oncology department. Micronucleus frequency (MN%) was measured in two cell lines: healthy lymphocyte-derived cell line (TK6) and oesophageal cancer-derived cell line (OE33). Additionally, other effects were also determined using several end-point measurements, including confocal microscopy imaging, cell cycle, invasion, and migration of cells upon plasma/serum treatment.

PIG-A is the catalytic subunit of the Phosphatidylinositol Acetylglucosaminyl transferase enzyme, encoded by the PIGA gene, which encodes an X-inked enzyme that is involved in GPI anchor synthesis. Measuring mutations in the PIGA gene allows for identifying individuals more prone to developing cancer due to exposure to harmful reagents. This study measures the transformation in the PIGA gene in healthy volunteers and non-cancer patients referred to an endoscopy department and cancer patients. This is an attractive tool to study the level of exposure, such as those associated with diet and exercise.