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HAGE-derived vaccines for the treatment of patients with TNBC patients that are predicted to have high risk of relapsed and poor survival rate, as assessed by a newly identified immune-gene signature

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Triple Negative Breast Cancer (TNBC) consists of very heterogeneous subgroups of breast cancers with significant clinical challenge, the prognosis and treatment of which remains poor and limited due to the lack of targeting structures for existing therapies. We hypothesised that disease recurrence and therapeutic resistance in those patients could be influenced/predicted by tumour-related immune-regulatory events that are reflected by changes in the immune phenotypes in the periphery. It is conceivable that the analysis of immune gene transcripts in the blood will inform clinical decisions and help predict which patients are likely to respond/benefit from chemo- and/or immune-therapy. Although, breast cancer has not traditionally been viewed as being particularly susceptible to immunotherapeutic approaches, recent evidence has demonstrated a role for immune surveillance in determining patient outcome. Moreover, recent data suggest that some patients with TNBC may benefit from immune-stimulating therapies that may act synergistically when combined with chemotherapeutic drugs and tumour vaccines targeting cancer specific antigens (CSAs) expressed in TNBC. We have found that the cancer testis antigen HAGE (DDX43, CT13) is expressed in 43% of patients with TNBC. In this study, we have assessed the potential value of a newly identified HAGE-derived vaccine, as administered using two different delivery systems, for the treatment of TNBC patients using pre-clinical models. We have also used the nanoString nCounter™ FLEX amplification-free gene profiling platform to determine whether the immune-related-gene profiles in the PBMC of TNBC patients could predict patients with high risk of recurrence and poor survival rate. We therefore propose that TNBC patients with such a gene profile may benefit from a HAGE-derived vaccine.