

## Summer Research Program 2026 – Projects

### Project #13

**Title:** Investigating a potential biomarker in Triple Negative Breast Cancer

**Description:** The emergence of immunotherapy has revolutionized the treatment of several cancers, including triple negative breast cancer (TNBC). Nevertheless, durable clinical response rates are limited mainly due to metastasis and resistance mechanisms. Using The Cancer Genome Atlas (TCGA) and I-spy2 Clinical trial breast cancer data sets, we identified a set of genes, down-regulated in TNBC by hyper-methylation, that are associated with better patients' outcome to immunotherapy. We hypothesize that these genes may potentially play a biological role in response to immunotherapy. The summer research program project will involve optimizing the over-expression of one of the genes in several breast cancer cell lines, validate the expression by quantitative real time PCR and western blotting, followed by phenotypic characterization (effect on cell proliferation, cell migration and invasion). This will form the basis for future investigation of the biological role of the target gene in immune-regulation and response to immunotherapy.

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