**Background**

LIV-1 is an estrogen-inducible gene that has been implicated in epidermal-to-mesenchymal transition (EMT) in preclinical models of progression and metastasis. Its expression is associated with node-positive breast cancer; and has been detected in a variety of cancer types, including estrogen receptor positive breast cancers.

SON-LIV1A is a novel antibody-drug conjugate targeting LIV-1 that is ongoing in I-SPY 2. Leveraging the entire existing I-SPY 2 population: We also compared the pre-treatment LIV-1 mRNA expression levels within HR/HER2 subtypes across I-SPY 2, patients from completed arms and their relevant controls (n=689) using ANOVA and post-hoc Tukey tests. Our statistics are descriptive rather than inferential; and does not take into account multiplicities of other biomarkers outside of this study.

**Methods**

**Pilot Study:** LIV-1 IHC staining was performed by Quest Diagnostics on the pre-treatment samples of 100 patients screening for the I-SPY 2 Trial. We evaluated LIV-1 expression levels across the I-SPY 2 population. Further studies to evaluate LIV-1 as a biomarker of response to LIV-1 targeting therapies for the neoadjuvant treatment of breast cancer were warranted and ongoing in I-SPY 2.

**Correlation between LIV-1 IHC and mRNA**

LIV-1 mRNA expression is significantly correlated with LIV-1 IHC staining levels.

**Conclusions**

Our result suggests that although LIV-1 expression differs by subtype, it is expressed at a moderate/high level in the majority of patients. The good correlation between IHC and array-based LIV-1 expression levels enables us to leverage the entire existing I-SPY 2 dataset and confirm the high rates of LIV-1 expression across the I-SPY 2 population. Further studies to evaluate LIV-1 as a biomarker of response to LIV-1 targeting therapies for the neoadjuvant treatment of breast cancer were warranted and ongoing in I-SPY 2.

**Advocate’s Perspective - Susie Brain**

The positive results from the LIV-1 expression analysis shown here from breast cancer patients being screened for the I-SPY 2 Trial are encouraging. Furthermore, research has shown that a few antibody-drug conjugates that target LIV-1, such as the research drug SGN-LIV1A, are capable of killing cancer cells yet sparing healthy ones. Currently, this agent is being evaluated in the I-SPY 2 Trial. Hopefully, the LIV-1 targeted drug will improve patient outcomes, provide fewer side effects, and benefit patients and clinical scientists and clinicians with a relevant agent biomarker pair for women diagnosed with aggressive expression of LIV-1.

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**References**