**Kaplan-Meier Plot of all 13 genes identified from top5 unique Up/Downregulated DEG analysis that are significant to BC patients’ survival.**

**Two genes are found to be significant from the top-5 uniquely upregulated T47D CAST-1 GENES list.**

**Leucine Rich Repeat Neuronal-1 (LRRN1)**

A graph of diseased survival

Description automatically generated

Results: BC patients with low expression of LRRN1 are shown to be associated with the worst survival rate.

**Contactin-6 (CNTN-6)**

A graph of a diseased survival

Description automatically generated

**Results:** High expression is associated with the worst survival rate (p= 0.02).

**No significant genes are seen in the top-5 uniquely upregulated 231 CAST-1 GENES list.**

**Two genes are found to be statistically significant from top-5 uniquely downregulated T47D CAST-1**

**Homeobox B13 (HOXB13)**

**A graph of diseased survival

Description automatically generated**

**Results:** High expression is found to be associated with a poorer survival rate.

**Prolactin Induced Protein (PIP)**

A graph of a diseased survival

Description automatically generated

Results: Low expression is associated with the worst survival rate.

**No significant genes are found from the top-5 uniquely downregulated 231 CAST-1 GENES list.**

**One Significant gene was found from the top-5 uniquely upregulated T47D CAST-2 GENES list.**

**Fatty Acid Binding Protein 4 (FABP4)**

A graph of diseased survival

Description automatically generated

Results: Low expression of FABP4 is associated with a poorer survival rate.

**Four Significant genes were found from the top-5 uniquely upregulated 231 CAST-II GENES list.**

**PWWP (Pro-Trp-Trp-Pro) Domain Containing 3B (PWWP3B)**

**A graph of diseased survival

Description automatically generated**

**Results:** Low Expression of PWWP3B associated with poor survival of BC patients.

**Integral Membrane Protein 2A (ITM2A)**

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**A graph of diseased survival

Description automatically generated**

**Results:** High Expression of IT2MA is associated with a better survival rate.

**C-C Motif Chemokine Ligand 4 (CCL4)**

**A graph of disease-related survival

Description automatically generated**

**Results:** High expression associated with poorer survival rate.

**Phosphoglucomutase 5 (PGM5)**

**A graph of diseased survival

Description automatically generated**

**Results:** Low expression associated with poorer survival rate.

**One Significant gene was found from the TOP-5 downregulated genes Unique to T47D CAST-II GENES list.**

**Cytochrome P450 Family 4 Subfamily F Member 22 (CYP4F22)**

* **A graph of diseased survival

  Description automatically generated**

**Results:** Low Expression associated with worst survival rate (p-value= 0.000284).

**No Significant gene was found from the TOP-5 downregulated genes Unique to the 231 CAST-II GENES list.**

**No Significant gene was found from the TOP-5 upregulated genes Unique to T47D CAST-III.**

**One Significant gene were found from the Top-5 upregulated genes Unique to 231 CAST-III**

**BolA Family Member 2** (BOLA2)

**A graph of a diseased survival

Description automatically generated**

**One Significant gene was found from the Top-5 downregulated genes Unique to T47D CAST-III**

**GENES list.**

**MAS-Related G-Protein Coupled Receptor Member X2 (MRGPRX2)**

**A graph of diseased survival

Description automatically generated**

**One Significant gene was found from the Top-5 downregulated genes Unique to 231 CAST-III**

**GENES list.**

Synovial Sarcoma **SSX -Family Member 1**

A graph of diseased survival

Description automatically generated