

"UCKL1 is Dysregulated in the Transition from Early- to Late-Stage Breast Cancer in Younger Patients"



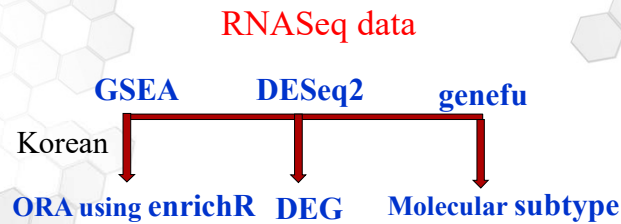
Background

The Incidence rate of breast cancer among very young adults is becoming an object of public concern in South Korea and elsewhere. There are a variety of presentations of breast cancer, with varying degrees of severity, and varying molecular presentations. These studies were designed to gain some insights into the molecular pathways that play a major role in the transition from early- to advanced-stage cancer in young patients.

Methods

RNASeq data from:

- A South Korean study aged 35 years or younger
- A group of mostly white participants, 35 years-old or younger,
- A group of mid-aged patients, 50 to 60 years old with either early- or late-stage tumors were leveraged from the International Cancer Genome Consortium or the cancer genome Atlas (TCGA).



Results

- Three BIOCarta database pathways over-represented ($p < 0.03$) among them DEGs: i) Platelet pathways, ii) Gamma-aminobutyric Acid Receptor Life Cycle pathway, iii) Fibrinolysis Pathway. Using the Reactome database, Glucuronidation pathway over-represented among the DEGs. GSEA analysis showed that Vitamin D receptor pathway genes are enriched in early-stage tumors.
- UCKL1 is differentially expressed in early stage in both young BrCA Korean and young TCGA groups, which possibly uncovers important role of NK cells in these cohorts.
- Molecular subtyping showed Korean patients mostly have basal-like molecular_subtype whereas for mostly white TCGA, luminal subtypes are dominant.

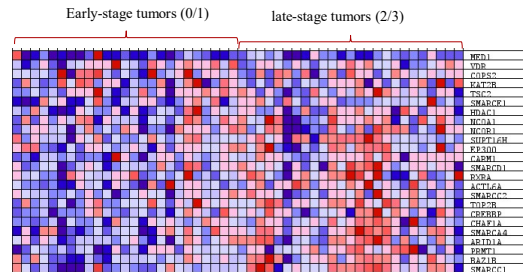
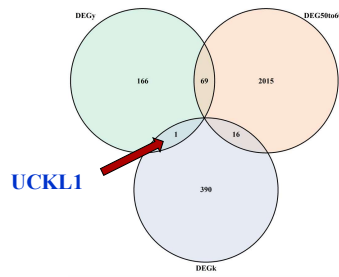


Fig. 1. BIOCarta_VDR_PATHWAY

Total TCGA young	basal %	Her2%	LumB %	LumA %	Normal %
35	20.0	11.4	51.4	11.4	5.7
Total TCGA 50to60	basal%	Her2%	LumB%	LumA%	Normal%
307	20	13	45	20	3
Total Korean	basal%	Her2%	LumB%	LumA%	Normal%
50	34.0	10	20	22	14

Table 1. MOLECULAR SUBTYPING

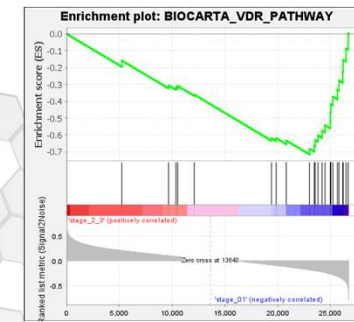


Fig. 4. Enrichment plot: BIOCarta_VDR_PATHWAY

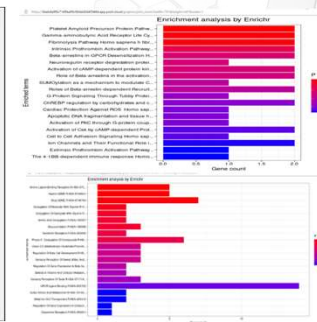


Fig. 5. Enrichment analysis by Enrichr (BioCarta and Reactome databases)

Conclusion and discussion

In conclusion, comparing the gene expression profile in very young women with breast cancer in South Korea, with early-stage tumors and more advanced-stage tumors showed dysregulation in Platelet, Drug Metabolism, and Vitamin D Receptor Pathways.

The Basal-like subtype is the leading type among BRCA Korean participants and luminal type is more dominant among the mostly white TCGA participants.

UCKL1 might be an important gene in the transition from early- to late-stage in BrCA in younger patients

References

- Advanced Search | ICGC Data Portal
- Love MI, Huber W, Anders S (2014). "Moderated estimation of fold change and dispersion for RNA-seq data with DESeq2." *Genome Biology*, 15, 550. doi: 10.1186/s13059-014-0550-8.

Disclosure: No one received any money for making this awesome poster.