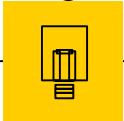


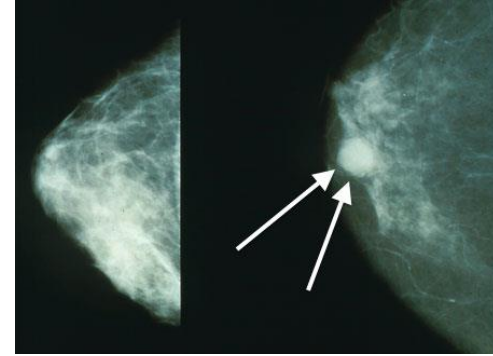
Prioritizing Breast Cancer Recurrence Genes





Breast Cancer

- ◉ Leading type of cancer in women.
- ◉ About 5–10% of cases are due to genes inherited from a person's parents, including **BRCA1** and **BRCA2**.
- ◉ Develops in cells from the **lining of milk ducts** and **the lobules** that supply the ducts with milk
- ◉ The American Cancer Society's estimates for breast cancer in the United States for 2017 are:
 - About **252,710** new cases of invasive breast cancer will be diagnosed in women.
 - About **40,610** women will die from breast cancer.



How Angelina Jolie's Mutant Gene Can Cause Cancer

Tuesday morning actress and sex symbol Angelina Jolie announced that she **had both of her breasts removed** in a preventative surgery to reduce her risk for breast cancer.

She did this because she has a mutation in a **gene called BRCA1**.

What's the risk?

Mutations in the BRCA genes (there are two, named 1 and 2 respectively) increase a person's risk for cancers, including breast and ovarian. Only about 0.25% of the general population has mutations in these genes.



AP Photo/Amy Sancetta

She has a mutation in a gene called BRCA1 which increases the risk of breast and ovarian cancers.



Methods - Data

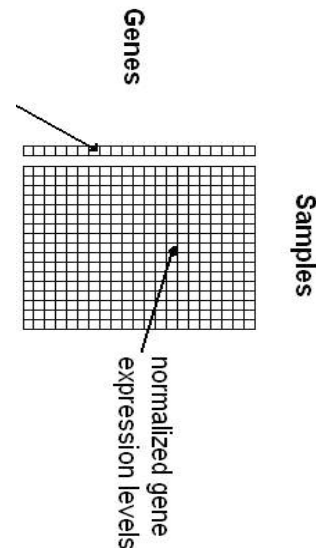
⊙ Normalized microarray data (Recurrence Online) of breast cancer patients with 5 year recurrence.

⊙ 21 genes and 703 samples (patients).

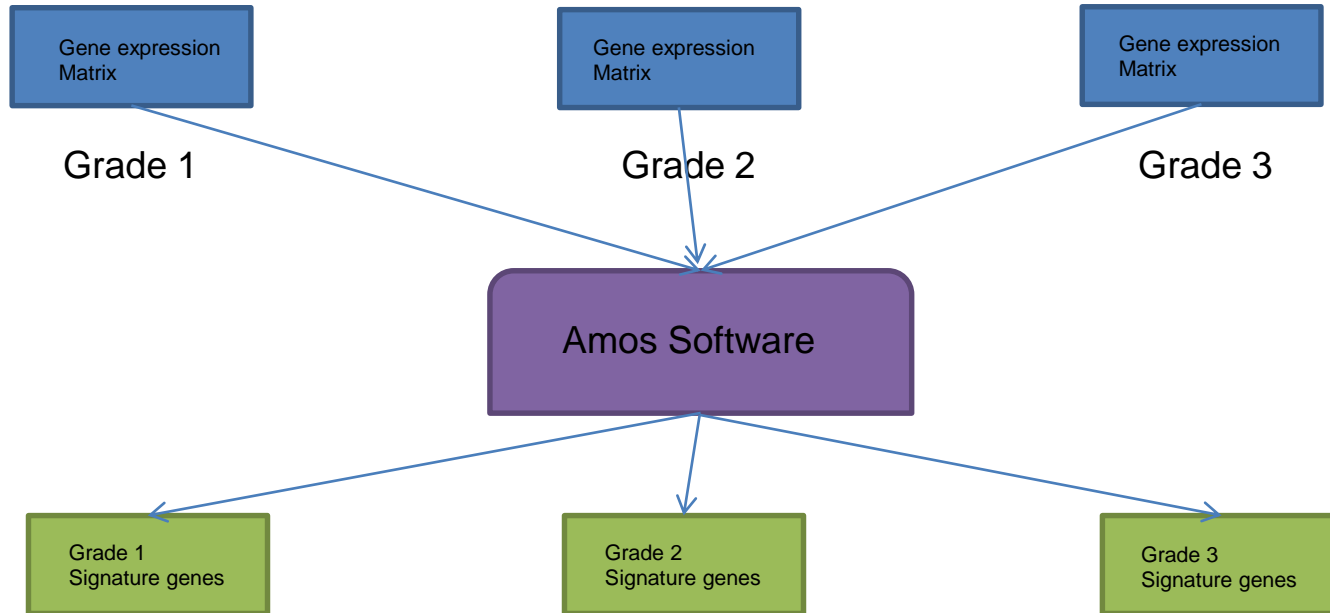
- **Grade 1-** 137
- **Grade 2-** 333
- **Grade 3-** 233

⊙ Independent Variable - Genes,

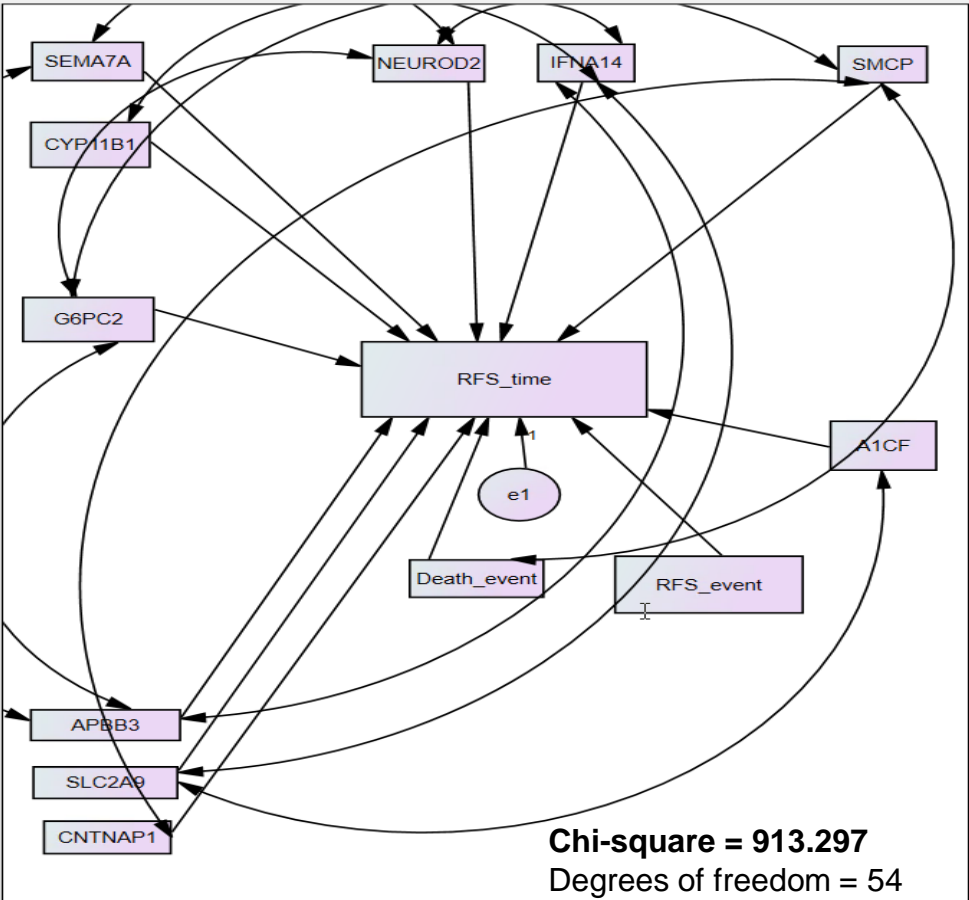
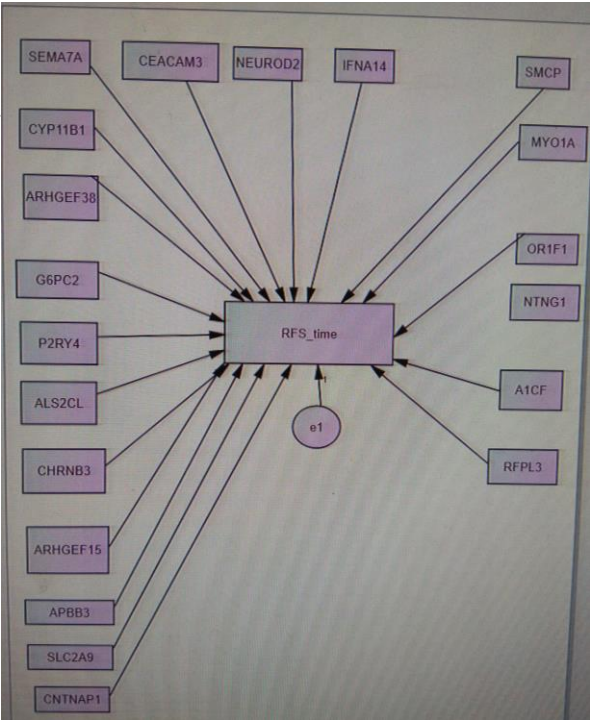
⊙ Dependent Variable - Recurrence free survival of the patients



Structural Equation Modeling



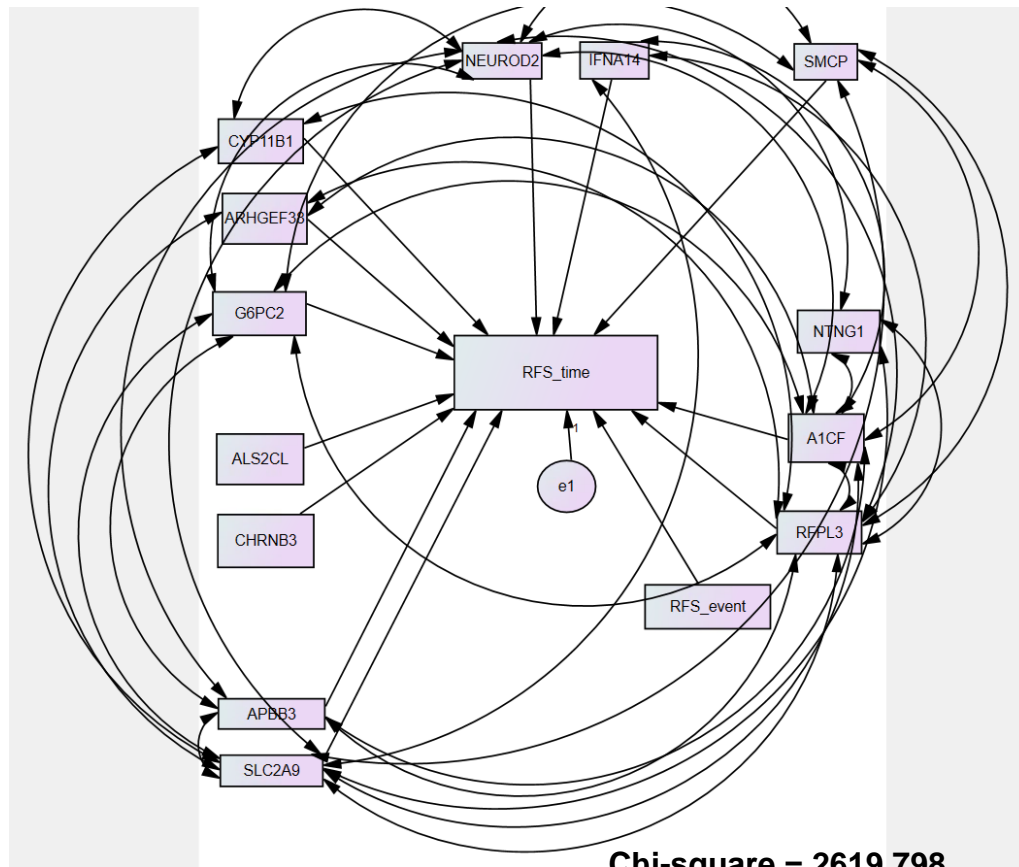
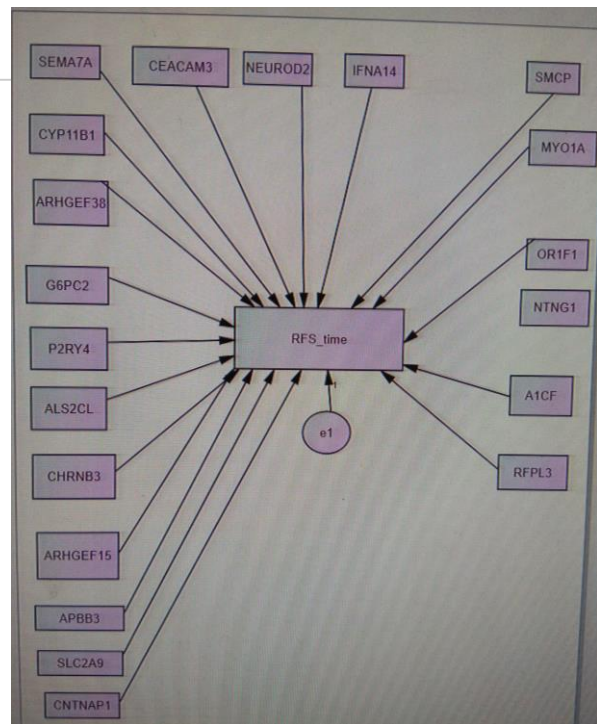
Grade 1



Chi-square = 913.297
Degrees of freedom = 54
Probability level = .000
CFI = 0.50
RMSEA = 0.342

- The Modification Indices suggest links to change in your structure.
- Connection was done incrementally, checking the change in chi sq after each one, to see if it has really helped to decrease chi-square.

Grade 1



Chi-square = 2619.798
Degrees of freedom = 59
Probability level = .000
CFI = 0.552
RMSEA = 0.362



Conclusion

- There are **overlapping** and **unique genes** inbetween Grade 1 and Grade 2 signature genes.
- Grade 2 signature genes model might provide **stronger chi-square value** and **more interaction** between genes.



Thank You