COMPUTATIONAL INTERACTION ANALYSIS
FOR REDOX REACTION PATHWAY

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**Introduction:**
- REDOX and Local Recurrence (LR) in breast cancer
- Artificial Neural Networks (ANN) stepwise Multi Layer Perceptron (MLP) and Back Propagation (BP)
  - Robust, nonlinear and flexible
  - Can handle huge and complex datasets
  - Applications ranging from simple decision making to complex medical intervention determining in cancer

**Objectives:**
- To compare conventional correlation statistical method (Correlation Coefficient; r) with in-house developed ANN Interaction analysis.
- To use in-house developed ANN to investigate REDOX pathway governing LR.
- To decipher REDOX pathway.

**Data Source:**
TMA data comprising of 35 primary breast cancer patients upon radiotherapy with LR (9 Positive & 29 Negative) tested with 36 IHC markers for REDOX.
Methodology

Conclusion:

• ANN predictive approach could be effectively used to simplify complex data.

• ANN was successful in elucidating clear positive and negative interaction hubs.

• Weighted interactions were found to be advantageous for elucidating directionality of interactions among markers.

• Positive and negative hubs could act as potential biomarkers of local recurrence in breast cancer.

• Validation with pathway reaction cascades and other sensitive high-throughput expression platforms is suggested.