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ARTIFICIAL NEURAL NETWORKS IN THE PREDICTION OF LYMPHO VASCULAR INVASION IN PRIMARY BREAST CANCER

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3 September 2010

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OVERVIEW

- Introduction
- Objectives
- Data Source

Introduction:

- Lympho Vascular Invasion (LVI) as a prognostic marker 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 use stepwise ANN with MLP and BP to select highly correlating genes from genomic data
- To use in-house developed ANN to investigate interplaying genes governing LVI
- To decipher LVI pathway

Data Source:

- Nottingham Tenovus Primary Breast Carcinoma data
  - ✓ 70 years and less women presented with stage I and II primary invasive breast carcinoma
  - ✓ 128 frozen breast cancer samples from Nottingham Hospital NHS Trust Tumour Bank between 1986-1992, using Illumina Gene array with 47293 genes

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- Methodology
- Results
- Discussion
- Conclusion

Discussion & Conclusion:

RESULTS

- ANN was successful in differentiating closely related gene isoforms
- Weighted interactions resulted in clear directionality and influence of one gene's expression on others showing positive and negative interactions
- In-house ANN interaction algorithm was helpful and elucidating pathway governing LVI in breast cancer
- Further validation with other pathway platforms and biological validation of pathway would be recommended.