

BACKGROUND

- **Breast cancer** - most common malignancy and second leading cause of cancer death among women.
- **Methylenetetrahydrofolate reductase (MTHFR)** - one of the most studied gene variations associated with breast cancer affecting epigenetic pathways.
- Epigenetic (gene-environment interaction) modifications from unhealthy environment and behaviors can lead to cancer.

PROBLEM STATEMENT

- Study results are inconsistent on breast cancer gene variations as risk factors for breast cancer.
- Inconsistencies are due to environmental and behavioral factors, i. e. **folate, alcohol intake, & smoking**, that warrant further investigations.



PURPOSE

- Investigate the associations of epigenetic risks for breast cancer.

SIGNIFICANCE

- Identifying health behaviors offers opportunity for future interventions that target epigenetic pathways for breast cancer prevention.

METHODS

SETTING

- Southern California counties – Los Angeles, San Bernardino, Riverside, and Orange

SAMPLE

- Total of 60 female participants - 30 breast cancer cases and one of their family members as controls will be recruited from California Cancer Registry.

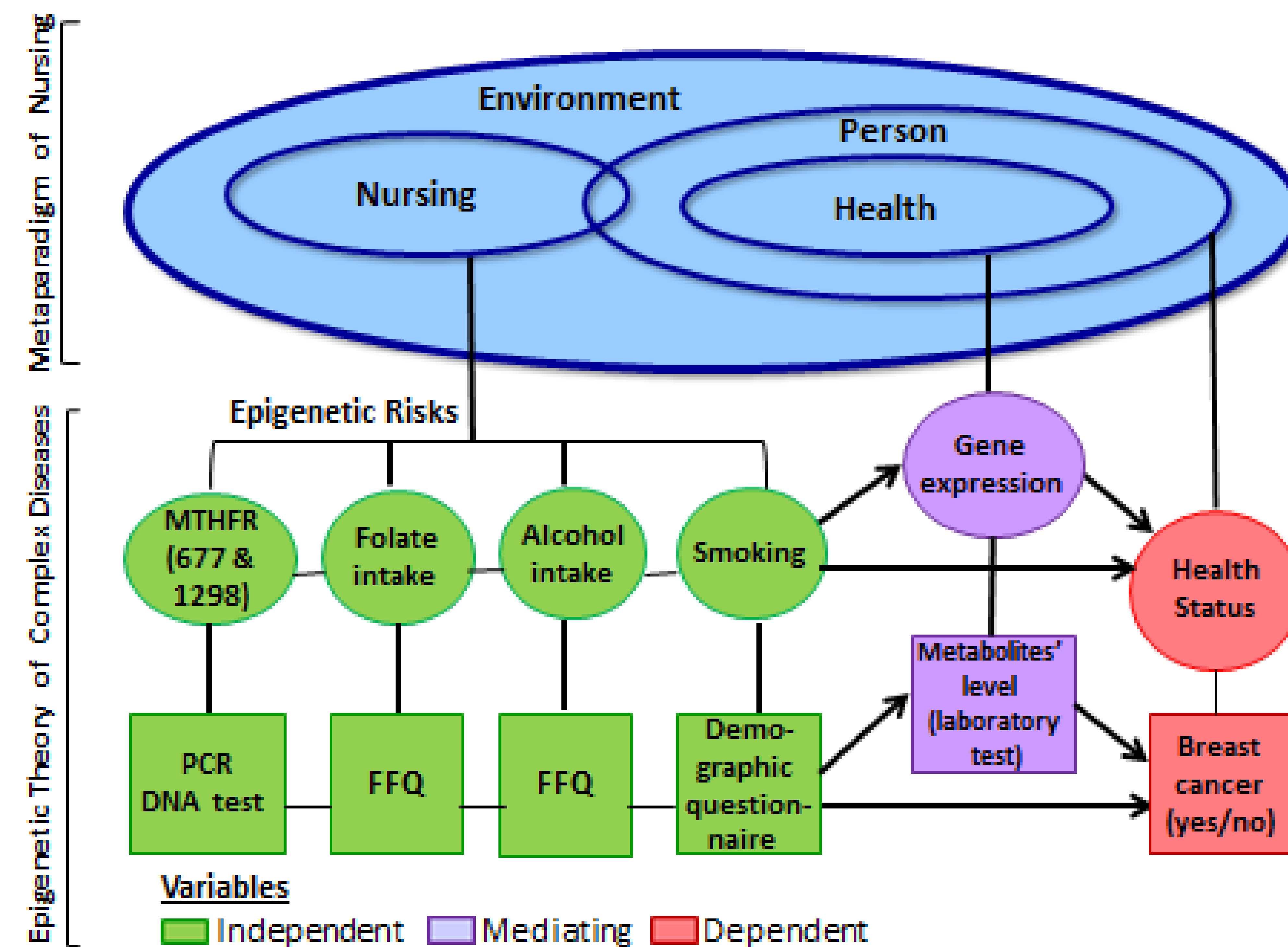
INSTRUMENTS

- Food Frequency Questionnaire (FFQ), 2000 Cancer Module National Health Interview Survey, and Demographic Questionnaire

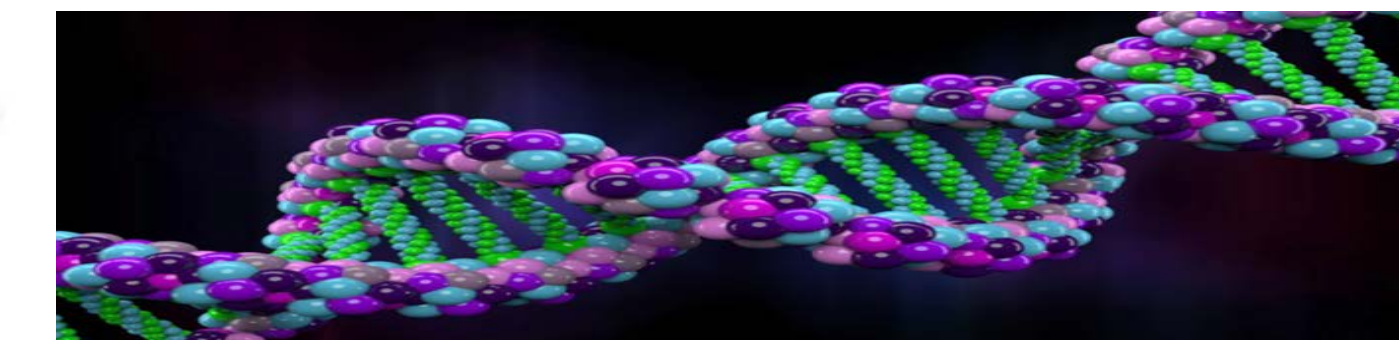
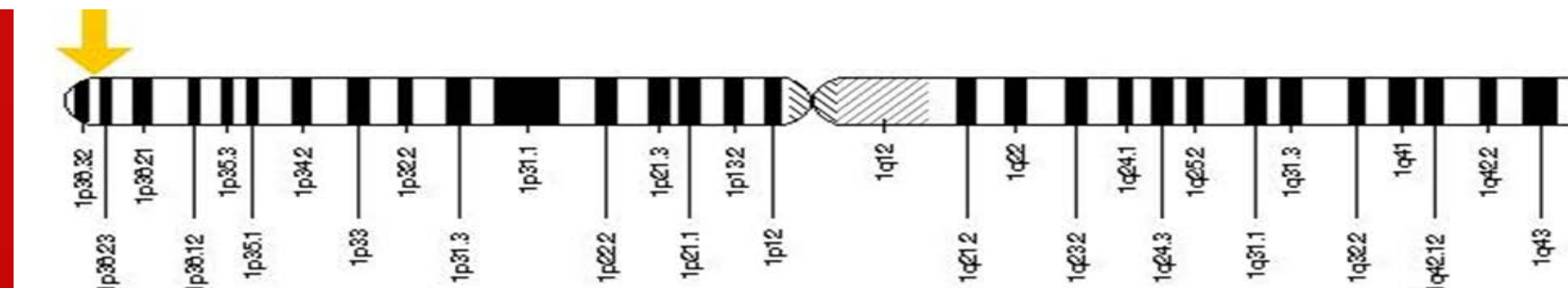
CONCEPTUAL THEORETICAL FRAMEWORK:

Nursing Metaparadigm and Epigenetic Theory of Complex Diseases

Cancer is a complex disease linked to epigenetic misregulation affected by endogenous and exogenous factors.



MTHFR Cytogenetic Location: 1p36.3 Chromosome 1



CONCLUSION

- Associations of epigenetic risks with breast cancer will serve as foundation for future development of innovative behavioral interventions ; personalized healthcare for breast cancer prevention and control based on genome health.

THEORETICAL IMPLICATIONS

- Foundation for new hypotheses and possible generation of middle range theory for epigenetics of cancer.

CLINICAL IMPLICATIONS

- Significant collaborative role of Nursing in translating knowledge of epigenetics into health promotion and disease prevention.
- Evolution of new targeted approach in diagnostics and treatment management for breast cancer.

HEALTH POLICY IMPLICATIONS

- Impact for high quality healthcare with enhanced genome health awareness and competencies among healthcare professionals.

FUTURE RESEARCH

- Future studies to establish epigenetic risks that can be reversed to prevent cancer.
- Prospective development of personalized behavioral intervention for cancer prevention and control.

ACKNOWLEDGEMENT

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ANALYSIS

LABORATORY ANALYSIS

- Salivary and/or blood samples for MTHFR gene variations (SNPs 677 1298) using PCR DNA test, serum folate, and metabolites' analyses

STATISTICAL ANALYSIS

- Pooled analysis of relative risks to determine rate differences between cases and control groups
- Correlation tests, *t*-test, and chi-square to determine associations among variables

DATA COLLECTION - in progress