



Open Discussion: Bioinformatics Needs and Collaborations

16th EPSCoR Annual Conference
KY NIH-IDeA Sub-committee
May 26, 2011
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University of Louisville

UNIVERSITY OF
LOUISVILLE[®]
J.B. SPEED SCHOOL
OF ENGINEERING 



COBREs/INBRE

Molecular Basis of Human Disease



COBRE in Women's Health

Obesity & Heart Disease



Molecular Targets

Diabetes & Obesity Center

Improving lives through ground-breaking research, comprehensive education & state-of-the-art training.



University of Louisville
Birth Defects Center

Collaborations in Place

- KBRIN/Molecular Targets:
 - NASA contract NNX10AJ36G
 - Diagnosing and Mitigating Human Exposure to Radiation Using Micro-Nanotechnology (R. Keynton, PI)
 - Meta-analysis of gene expression for ionizing radiation exposure



Collaborations in Place

- KBRIN/KSCIRC:
 - Systems analysis of collateral sprouting vs. regeneration
 - Interactions of genes across tissues
 - Led to development of system, CategoryCompare
 - Postdocs affiliated with KBRIN/KSCIRC supported by ARRA Award P20RR16481S1:
 - “Development of a Systems Biology Team”
 - KBRIN Supplement (N. Cooper, PI)



Strengths of KBRIN/INBRE Bioinformatics

- Functional genomics
 - DNA/Protein sequence algorithmic development/analysis (Eric Rouchka, UofL)
 - Machine Learning Techniques
 - Transcriptional and translational control (Rouchka, UofL)
- Gene expression/miRNA studies
 - Experimental design (Arny Stromberg, UK)
 - Data analysis (Stromberg, UK)
 - Systems integration (Rouchka, UofL)

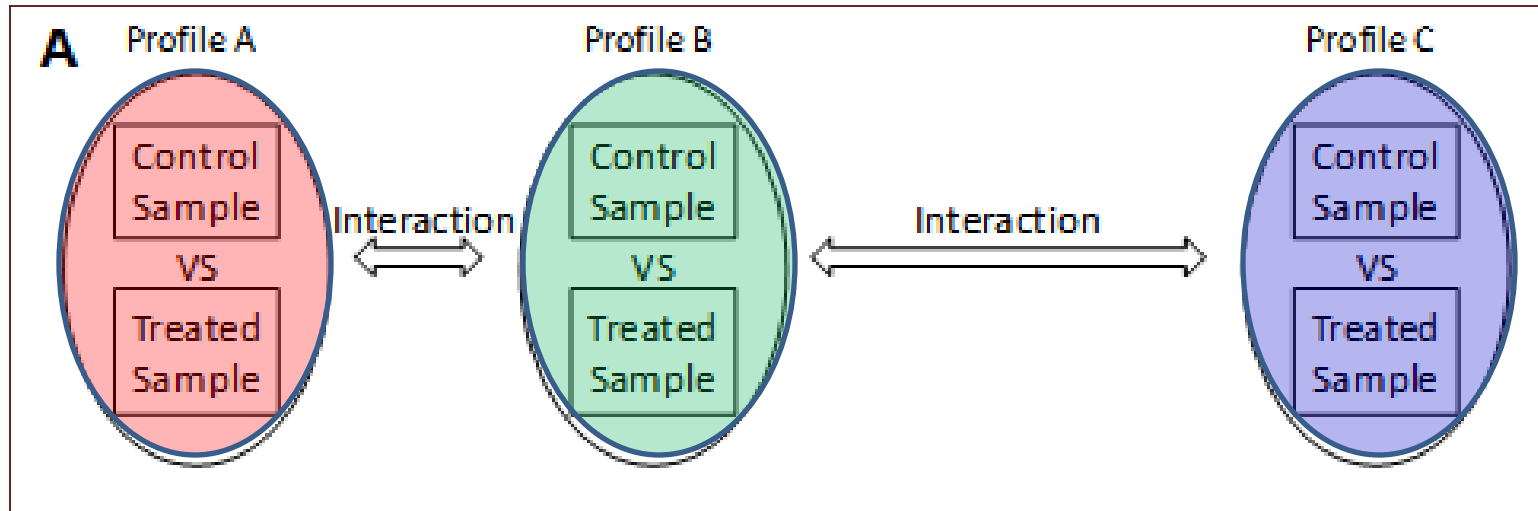
Strengths of KBRIN/INBRE Bioinformatics

- Next-generation analysis
 - RNASeq (Stromberg (UK), Rouchka (UofL), Ted Kalbfleisch (UofL))
 - De novo assembly (Rouchka (UofL), Kalbfleisch (UofL))
- Bioinformatics Education
 - Annual Bioinformatics Summit (Spring)
 - Undergraduate/Master's Training (Pat Calie (EKU), Claire Rinehart (WKU), Hunter Moseley (UofL))
 - Doctorate/Postdoctorate Training (Rouchka (UofL))

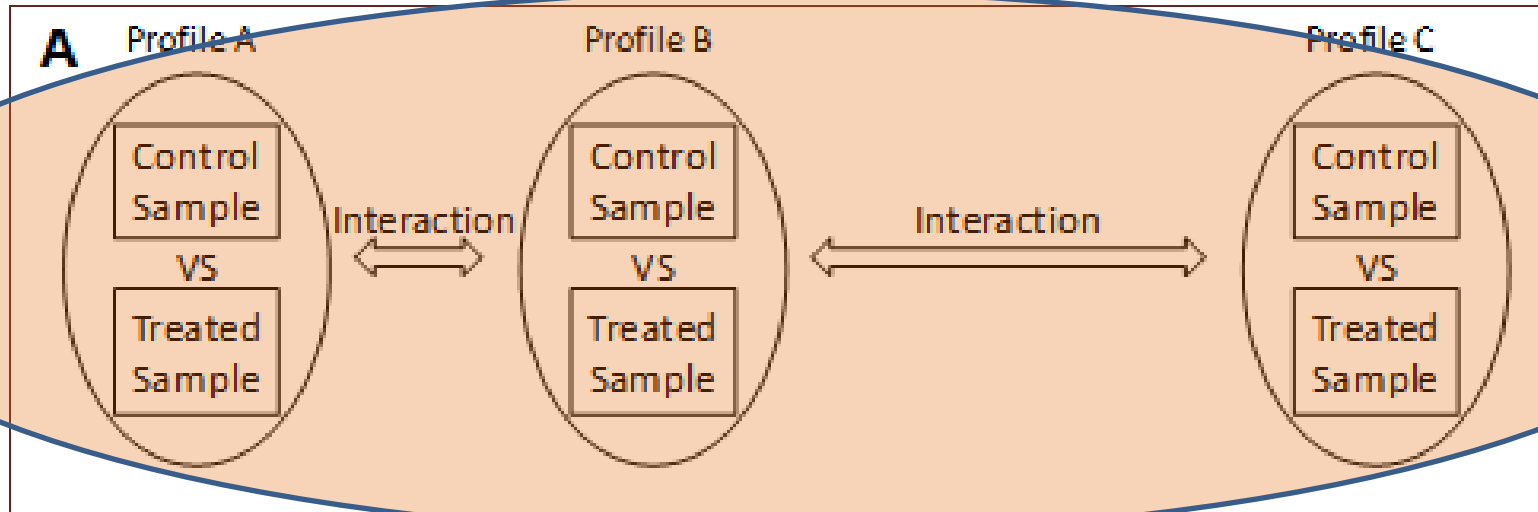
Increasing Collaborations

- What are the needs of COBRE researchers?
- What are identifiable true collaborations?
- Differentiate between collaboration and service

Traditional Approach

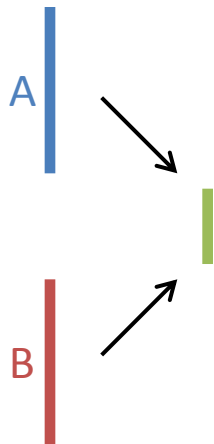


Our Approach

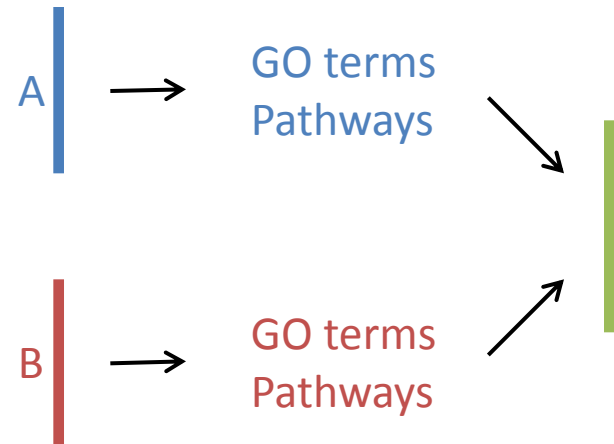


Categorical Meta-Analysis

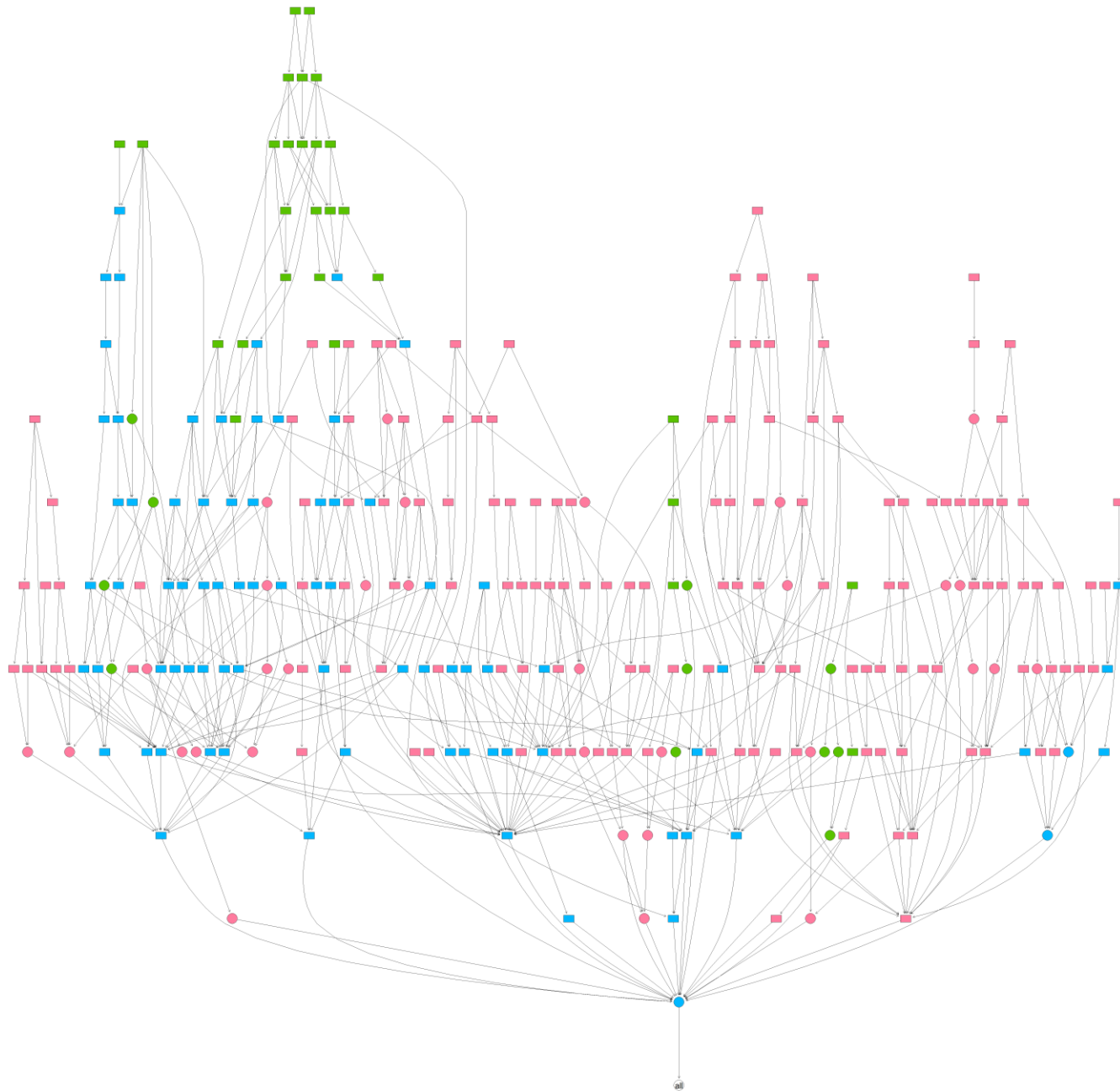
- Traditional meta-analysis
 - Compare genes in lists derived from multiple experiments



- Categorical meta-analysis
 - Compare enriched annotations (categories) from multiple gene lists



Skin
Muscle
Both





Skin
Muscle
Both

