

Integrated Biosystems Research

Genomics

Integrative Genomics

Team Report

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Regional **Research** –

- What biomedical problems or research challenges are being addressed by the different regional institutions?
- What specific approaches are being taken or technical hypotheses are being explored to address these problems?

Describe

Discover

Demonstrate
Validate

Deliver

Describe

Discover

Demonstrate Validate

Clinical
Specimens

DNA

SNPs
Sequence
Alleles
CGH
Methylation

RNA

Expression

Protein

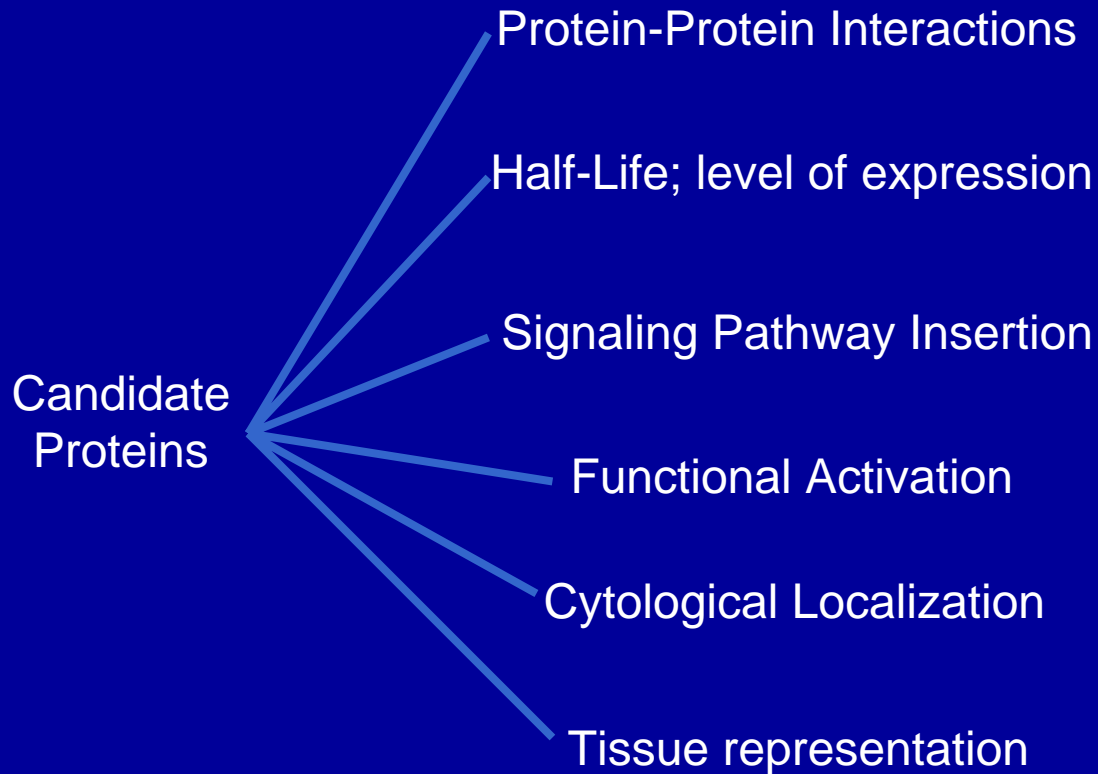
Proteome scanning

Tissue

Annotation

Candidate
Genes

Candidate
Proteins



BIOMARKERS

TARGETS



Diagnosis / Prognosis
Disease Subclassification
Phase I Trials
Surrogate Markers:
- Therapeutic Response
- Target "hit"

DNA

RNA

Protein

Glycosylation

Localization

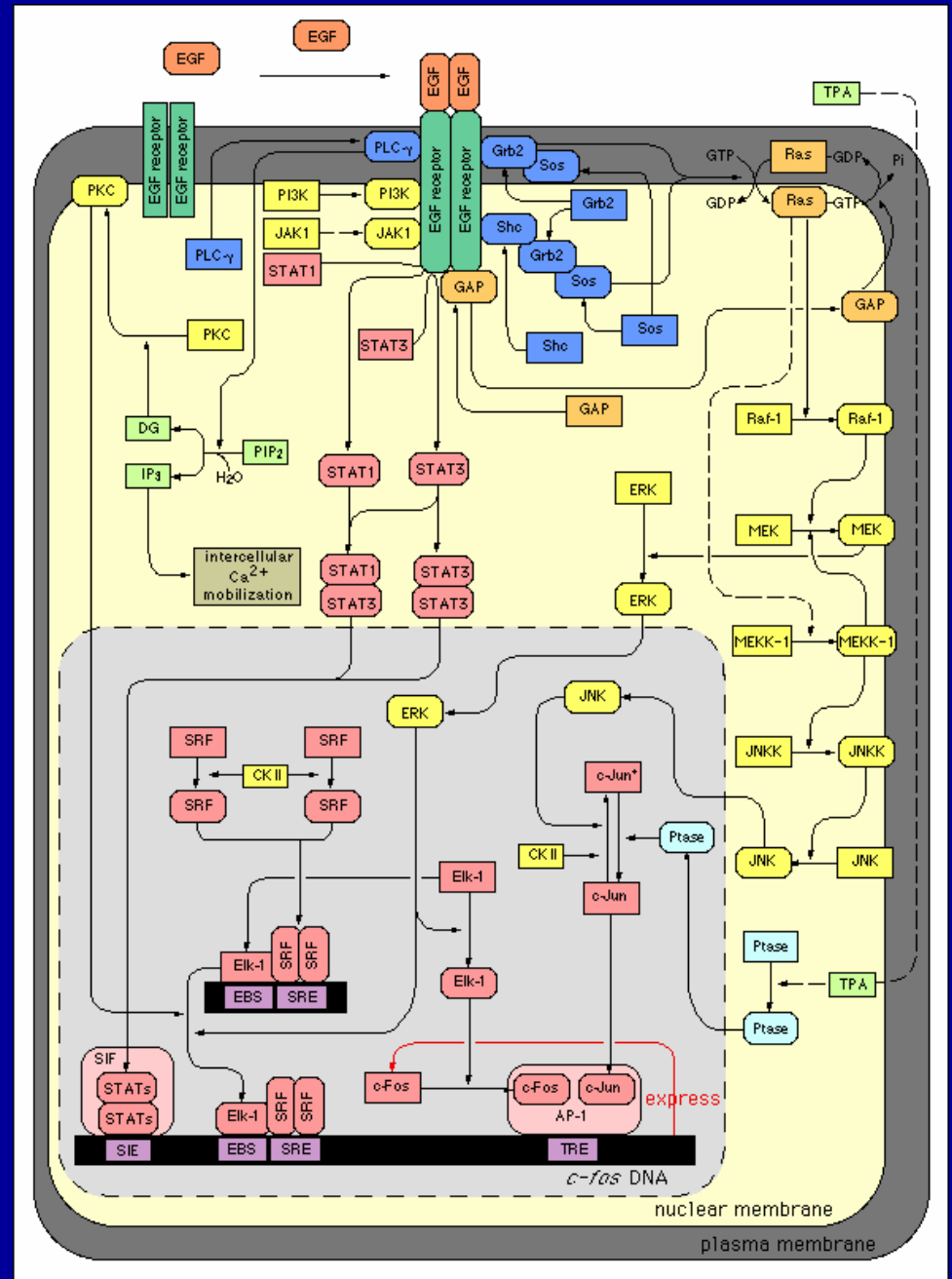
Dimerization

Phosphorylation

Internalization

Ubiquitination

Degradation



Regional **Resources** –

- What resources, skills, facilities, tools and equipment are currently being employed?

Resources

- Genomics *writ* large
 - DNA sequencing
 - Expression Profiling
 - SNP chips
 - CGH arrays
 - Methylation Arrays*
- BioInformatics (DNA- & RNA-centric)
- **Tissue is the Issue**

Regional **Needs** –

- What are current or anticipated needs for resources, capabilities, skills, equipment, or processes to advance more effective research?

Overarching Needs

- **Tissue is the Issue**
- **Tissue is the Issue**
- **Tissue is the Issue**

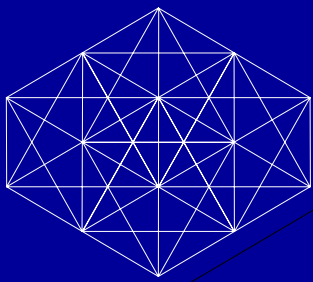
Regional **Synergy**

How might Genomics specifically benefit or be made more effective through enhanced proteomics capabilities?

Benefits from Proteomics

- **Target Validation**
- **Signaling pathways**
- **Protein-protein Interactions**
- **Post-translational modifications accounting for dysfunction of gene products**
- **Biomarker discovery/validation**

Regional **Recommendations** –



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Genomics

Regional **Synergy** – Recommendations:

Proteomics
Research
Center
(Multi-Site)

**Distributed
Enabling
And
Collaborative
Technologies**

Clinical
Services

Regional **Synergy** – Recommendations:

Proteomics
Research
Center

(Multi-Site)

**Distributed
Enabling
And
Collaborative
Technologies**

Clinical
Services

- ❑ High-end technology-focused proteomics research laboratories
- ❑ Connectivity Mapping to articulate proteomics with clinical and genomics research
- ❑ Indwelling proteomics, nano-devices

Regional **Synergy** – Recommendations:

Research

**Distributed
Enabling
And
Collaborative
Technologies**

Clinical
Services

- Antibody production facility
- Reverse phase phosphoproteomics
- Mass spectroscopy
- Proteomics profile bank of normal and diseased specimens
- Yeast 2-hybrid platform

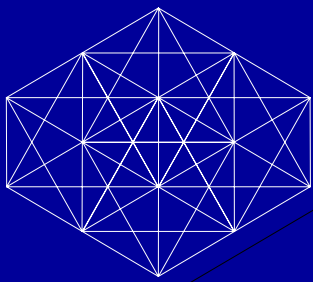
Regional **Synergy** – Recommendations:

Research

**Distributed
Enabling
And
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Technologies**

Clinical
Services

- CLIA-Certified proteomics laboratory
- Biomarker Assay Lab
- Surrogate Biomarker Assay Lab
- Protein / Drug Interactions Lab



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Questions and Answers?