TRANSMART - INTRODUCTION

IP&Science
Life Science Analytics Consultant

심진한 부장

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TRANSMART INTRODUCTION

- TranSMART is an open source platform for translational research. The implementation of tranSMART is not trivial and requires substantial expertise and hand-on experience which our Professional Services team can offer.
- We can provide a complete package of curation and ETL services to enable data processing, annotation, loading, management and visualization in tranSMART and integration with pathway analysis tools.
- We are highly qualified for this having worked with J&J on the development of the original platform for over 3 years and run long-term tranSMART consulting projects at several pharmaceutical companies.

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tranSMART – TRANSLATIONAL DATA WAREHOUSE

- Developed at Johnson & Johnson as an enabling environment for translational science for:
  - Disease definition
  - Patient stratification
  - Drug Target Identification
  - Drug Indication Selection
  - Epidemiology
  - Direct Portfolio Stage Gate Support
- Data warehouse to support needs of multi-disciplinary researchers across discovery and clinical organizations.

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TYPICAL CLINICAL KNOWLEDGE MANAGEMENT

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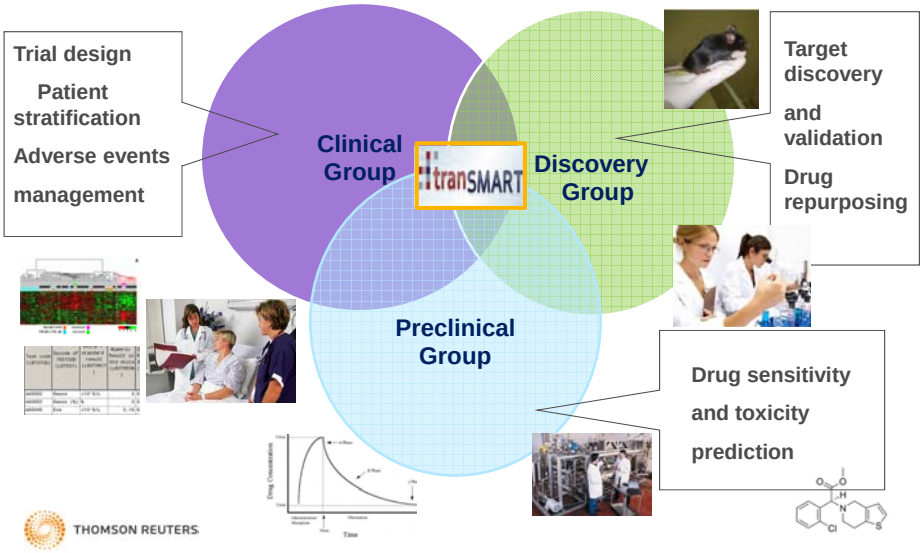
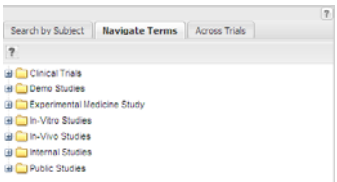
TRANSMART



TRANSMART – DATA SOURCES

- Clinical Trials
  - Demographics, Medical History
  - Clinical Treatments & Measurements metabolites, histopathology, lab results
  - Clinical Outcomes (time to DP, progression of disability, radiographic scores, AE etc.)
  - Established or putative biomarkers (gene expression data from patients)
- Pre-clinical Studies
  - PK/PD
  - Biomarkers e.g. gene expression (cell lines)
  - Toxicology
- Internal
- Vendors
- Partners
- Public
  - NCBI's GEO
  - EBI's ArrayExpress
  - National Brain Bank
  - ADNI



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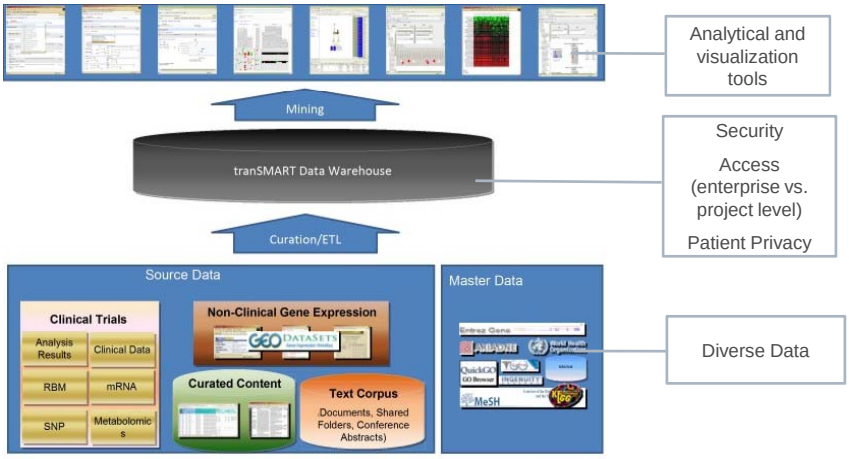
TRANSMART – DATA WAREHOUSE



Szalma S.; Koka, VC.; Khasanova, T.; Perakslis, E. **:Effective knowledge management in translational medicine** *Journal of Translational Medicine 2010, **8:68***

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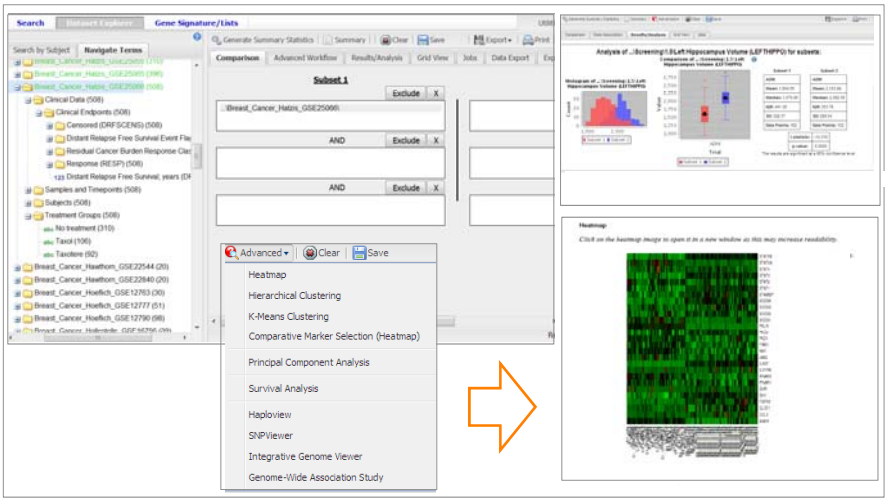
TRANSMART – USER INTERFACE



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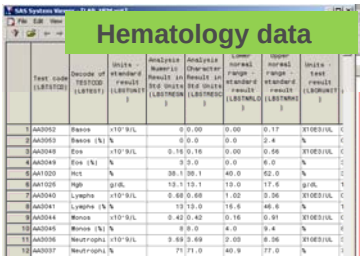
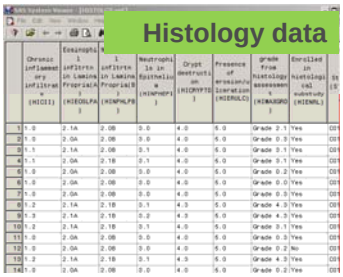
TRANSMART – EXAMPLE DATA TYPES

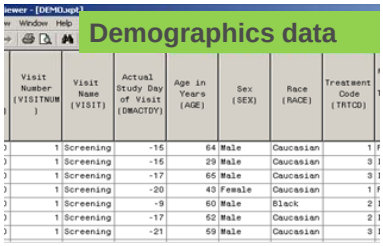
Hematology data



Histology data



Demographics data



Visit Number (VISITNUM)	Visit Name (VISIT)	Actual Study Day of Visit (DMACTDY)	Age in Years (AGE)	Sex (SEX)	Race (RACE)	Treatment Code (TRTCD)
1	Screening	-16	64	Male	Caucasian	1
1	Screening	-16	29	Male	Caucasian	3
1	Screening	-17	65	Male	Caucasian	3
1	Screening	-20	43	Female	Caucasian	1
1	Screening	-9	60	Male	Black	2
1	Screening	-17	62	Male	Caucasian	2
1	Screening	-21	59	Male	Caucasian	3

Clinical endpoints

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PREDICTION OF MS RELAPSES BY GENE EXPRESSION PROFILING OF PERIPHERAL BLOOD CELLS

- GSE15245 - Gurevich et al. *BMC Medical Genomics. 2009.2:46*
- **Purpose of the study**: establish a gene expression profile predictive of next MS relapse
- **Clinical utility**: ability to **predict frequency of relapses** in MS would enable doctors to intervene and to **plan clinical trials** more accurately
- **Additional insight:** Provide a **better understanding of the biology** of the disease

Analysis in tranSMART

- "Reproduce" published results using authors' predictive gene signature
  - ✓ "Time to Relapse Correlates" with gene expression level for some signature genes
  - ✓ Clustering analysis results are less satisfying
- Generate a new gene signature of differentially expressed genes for "Relapse" and "No relapse" patient cohorts in TM
  - ✓ Marker Selection analysis
  - ✓ Enrichment analysis

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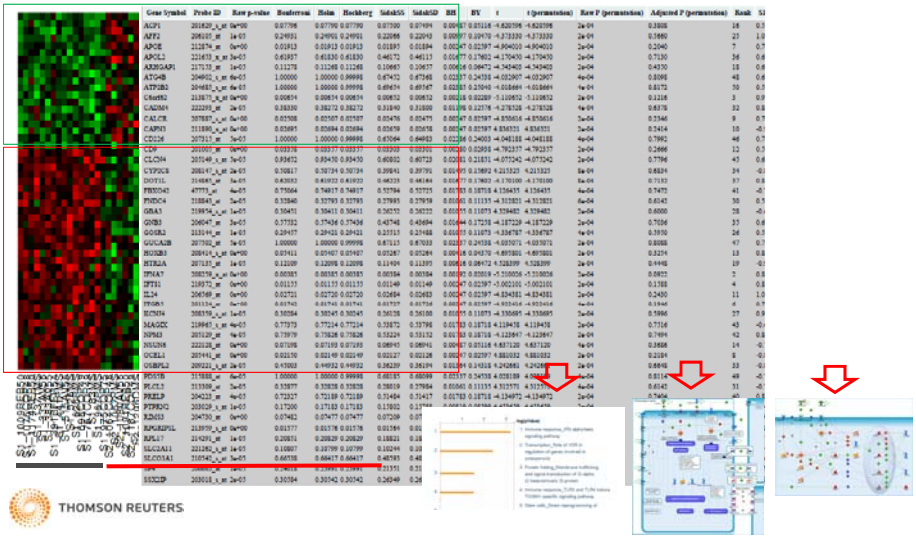
MARKER SELECTION ANALYSIS (MULTIPLE SCLEROSIS- GSE15245)

Top 50 differentially expressed genes for "Relapse" and "No relapse" MS patient cohorts



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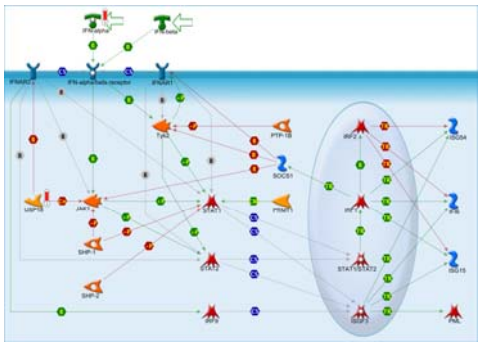
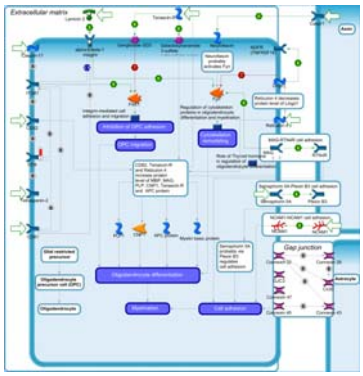
INTEGRATION WITH PATHWAY MAPS (METACORE/METAMINER)

Hypotheses about MS biology connections for some DEGs

Map: Immune response IFN alpha/beta signaling pathway



Map: Role of cell-cell and ECM-cell interactions in oligodendrocyte differentiation and myelination



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TRANSMART - BENEFITS

- **Improve Collaboration Across Global Drug Development Silos**
  - Grant access to multi-disciplinary teams to relevant data
  - All data (pre-clinical & clinical) and supporting information at researcher's fingertips
  - Extract value from data that has been inaccessible, unsearchable etc.
- **Patient Stratification Based On Cutting-Edge Biomarker Information**
  - Select relevant population based on range of criteria, including patient sub-types & ethnicity across global markets
  - Quickly find putative biomarkers for efficacy or toxicity
  - Support development of companion diagnostics
- **More informed Clinical Trial Design and Trial Data Interpretation**
  - Integrate a variety of phenotypic, genotypic and reference data
  - Use preclinical data to support a hypotheses generated using clinical data
  - Apply multiple levels of data to better validate hypotheses and inform data interpretation

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WHY THOMSON REUTERS?

- Fortune 500 Company
  - Involvement with tranSMART since inception (J&J)
  - End to end service provider for tranSMART
- Deep experience in annotation & pathway technology
  - Tool/Database (Pathway Editor/MetaCore)
  - Building Proprietary and public ontologies/dictionaries
- Experienced, diverse team of annotators/scientists
  - Well established curation process,
  - Repeatable workflow, redictable timeline
- Proven track record of delivery of similar & related projects
  - With resources both on- and off-site as needed

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TRANSMART – SOFTWARE

- **Open Source Innovation**
- Award winning platform for **precompetitive collaboration** and **private-public partnerships** in drug discovery and life sciences
- The **Standard-** and **Trendsetter** in Translational Medicine

CIO100


How Informatics Can Potentiate Precompetitive Open-Source Collaboration to Jump-Start Drug Discovery and Development


JOURNAL OF TRANSLATIONAL MEDICINE

METHODOLOGY Open Access

Effective knowledge management in translational medicine

Abstract

E.D. Perakslis, J. Van Dam, S. Szalma: How informatics can potentiate pre-competitive open source collaboration to jump-start drug discovery and development; *Clin Pharmacol Ther 87: 614-616 (2010)*

S. Szalma, V. Koka, T. Khasanova, E.D. Perakslis: Effective knowledge management in translational medicine; *Journal of Translational Medicine, 8:68 (2010)*

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Thank you