

Twin-Indo Dutch Workshop LSH - Trivandrium, January 21st, 2010 -



Erasmus Center for Bioinformatics

a department of Erasmus MC
University Medical Center Rotterdam

www.erasmusmc.nl/bioinformatics

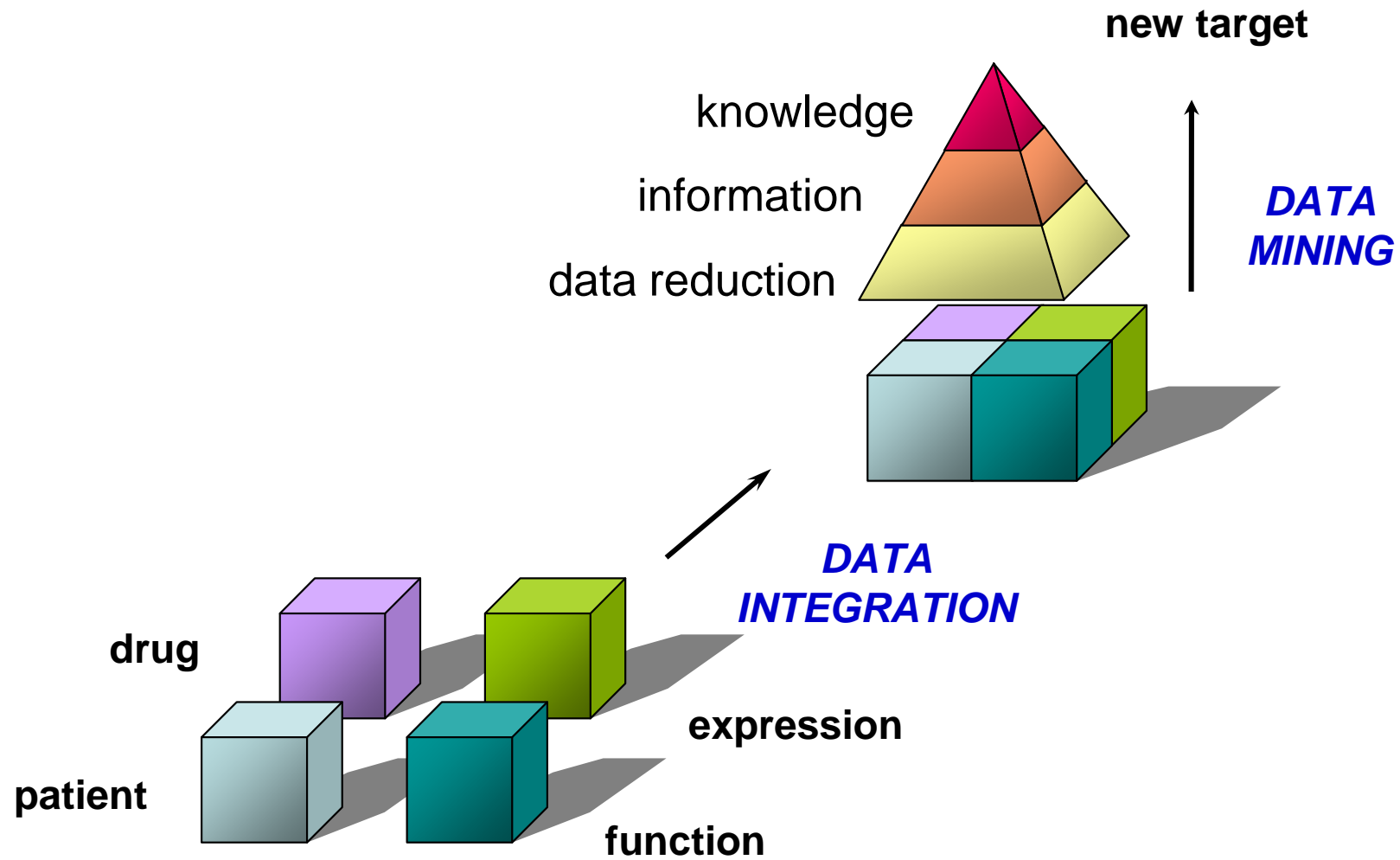
Prof. dr. Peter J. van der Spek



Biobank Diagnostics

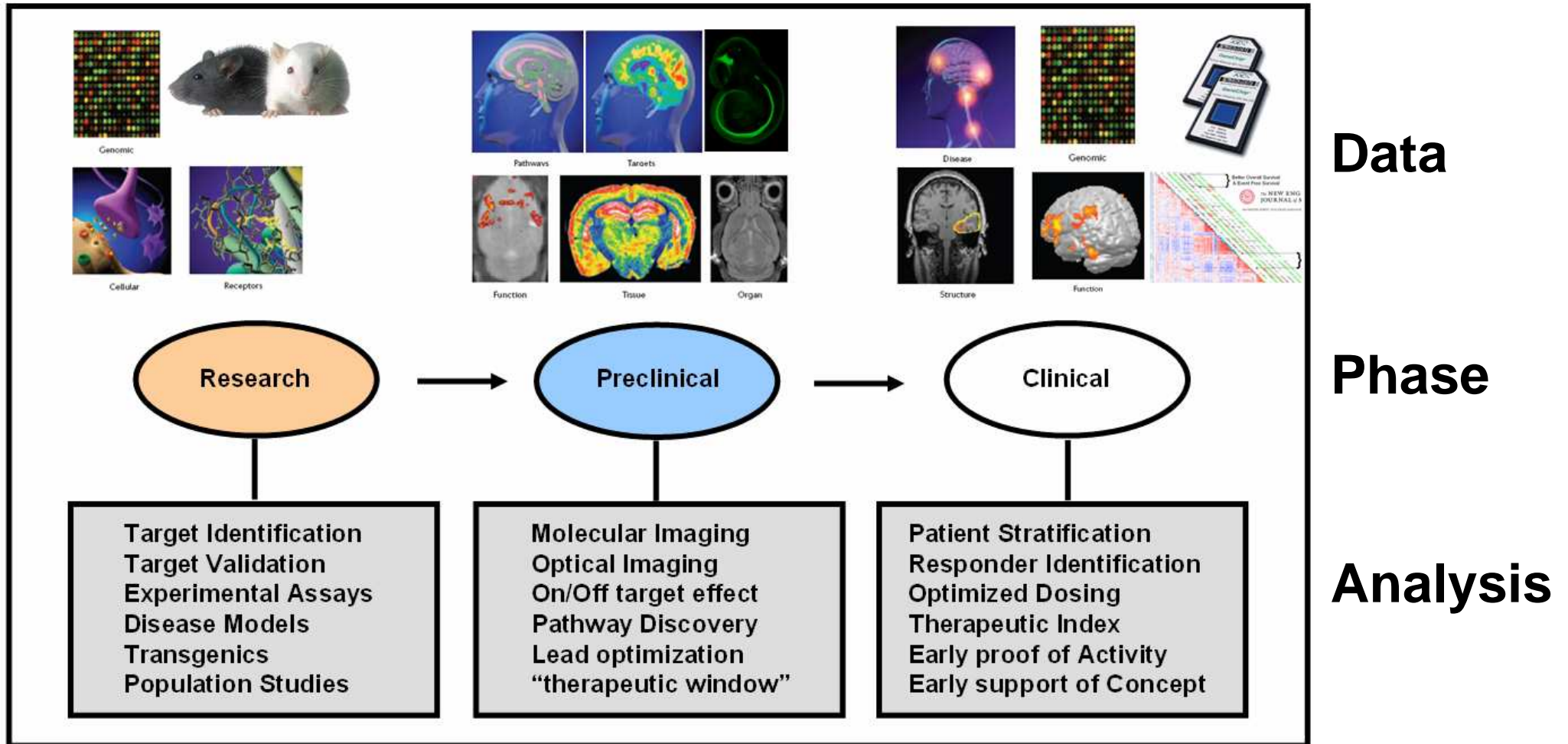
- Identifying large-scale structural variation
- Detecting chromosomal rearrangements
- Identifying mutations
- Profiling gene expression
- Characterizing changes in methylation
- Functional genomics
- Molecular Imaging (OPT)

Data Integration & Knowledge Transfer



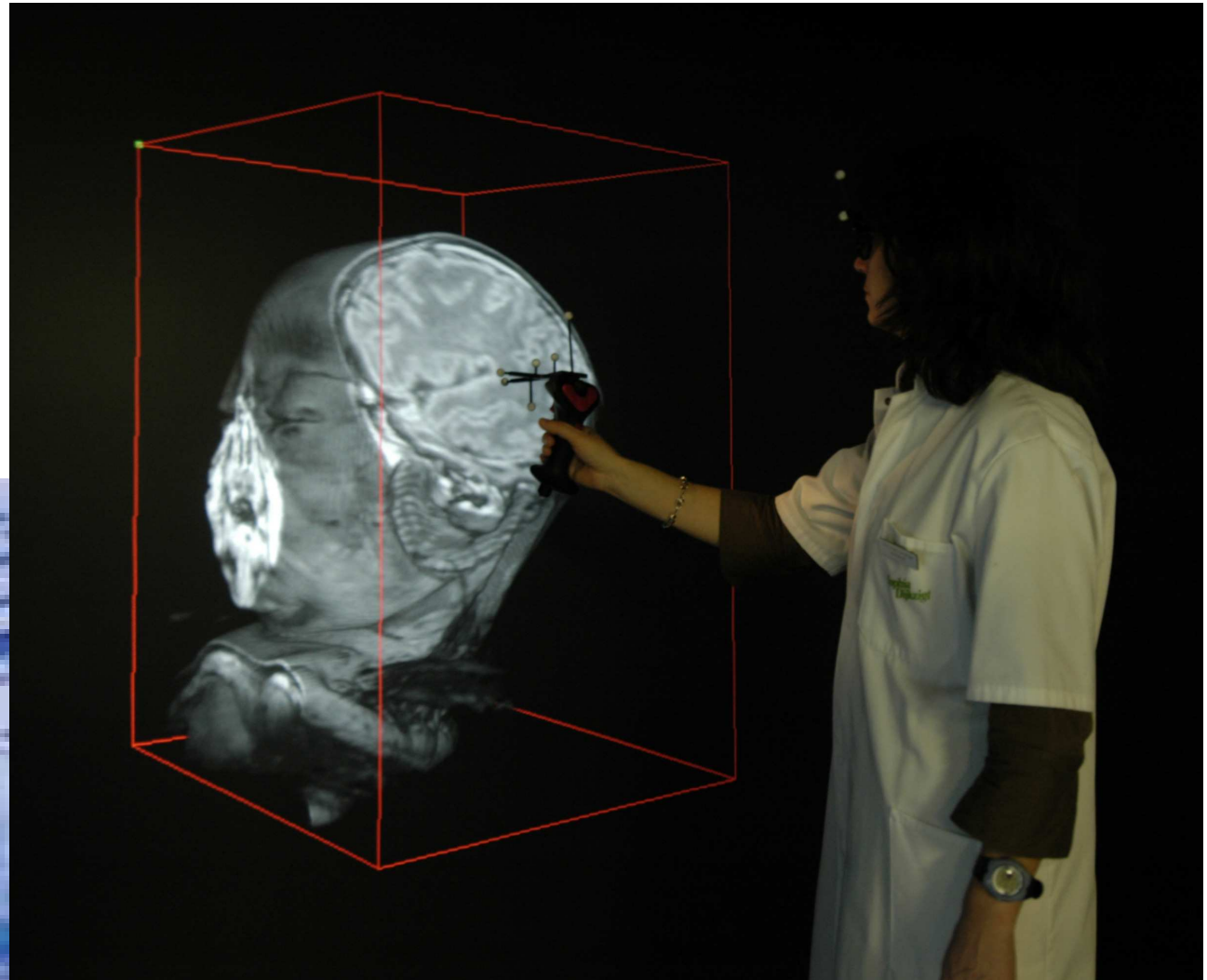
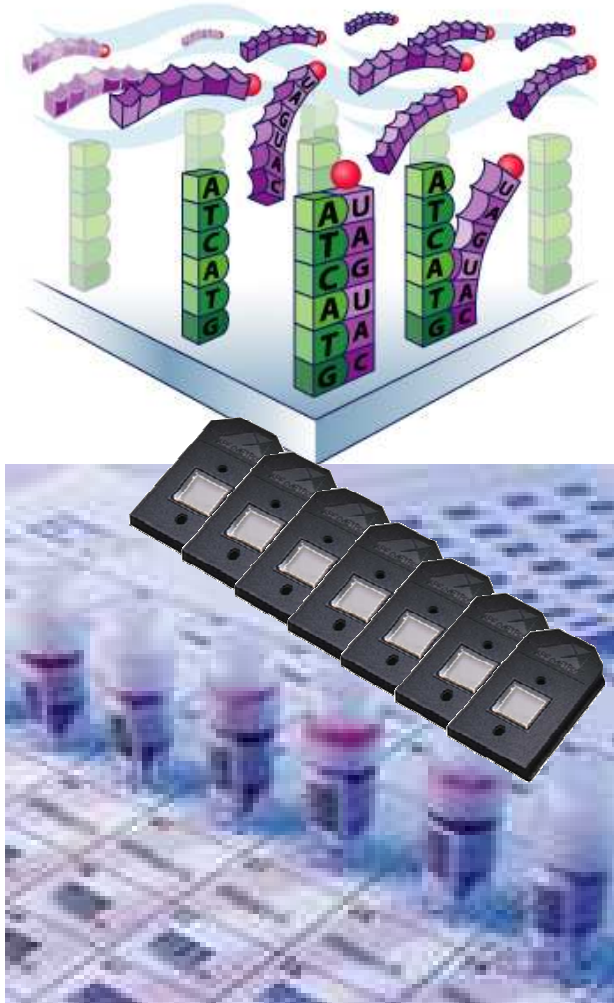
Evidence based Decision Making

- Keeping in Mind Security Levels -



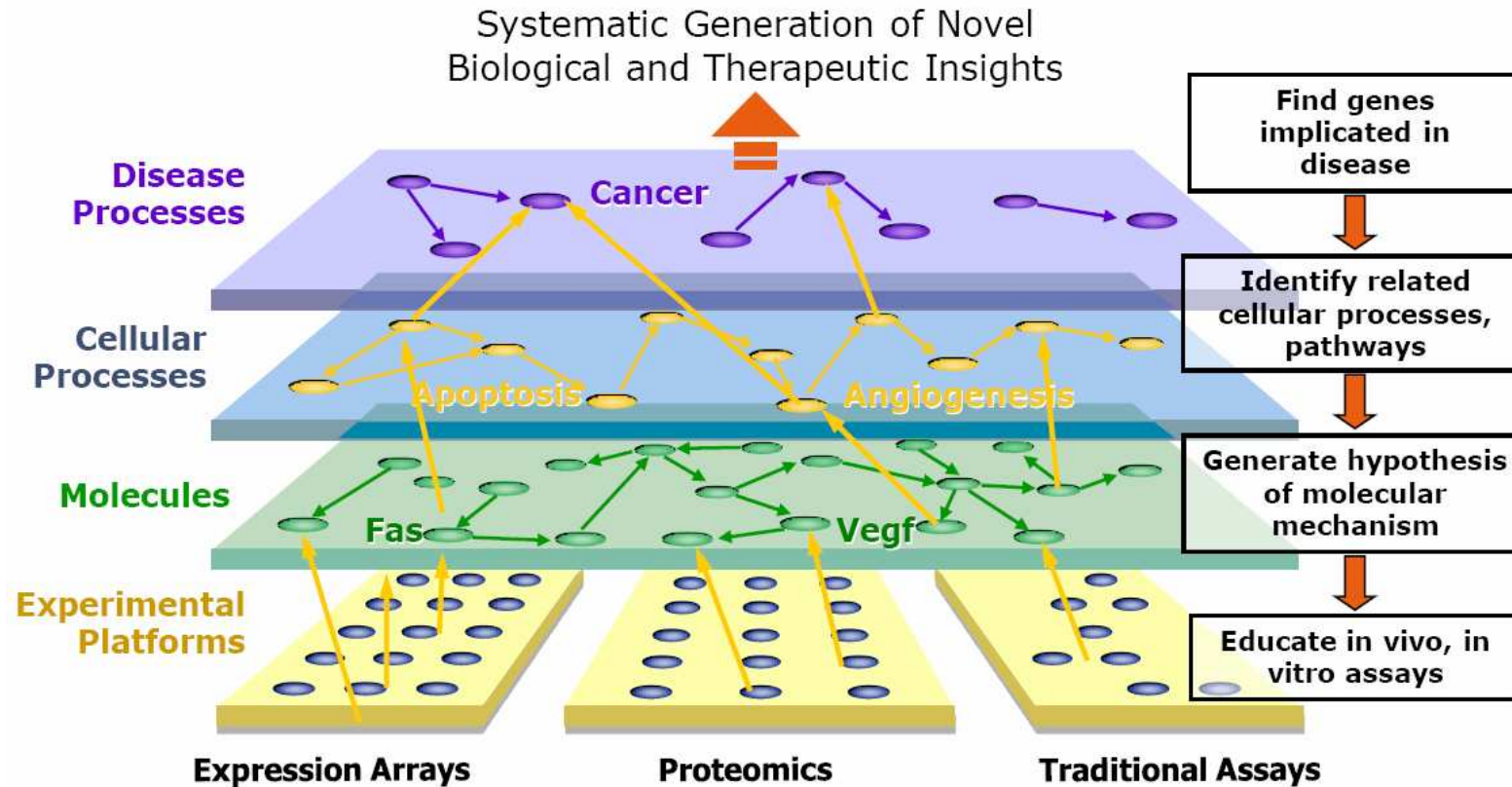
From Data to Knowledge leading to Concept Discovery

Novel Diagnostic Devices & Molecular Imaging



High Throughput data & Biobanks

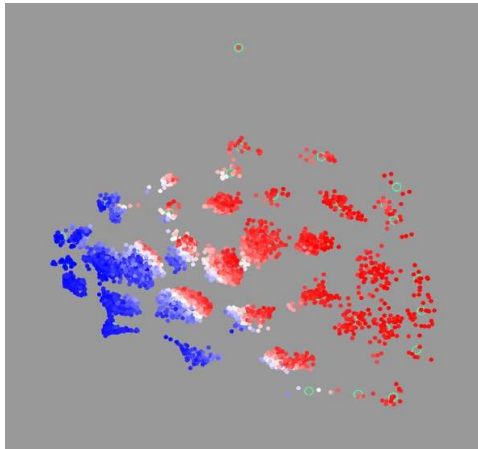
- Aim: Patient Stratification -



DX test

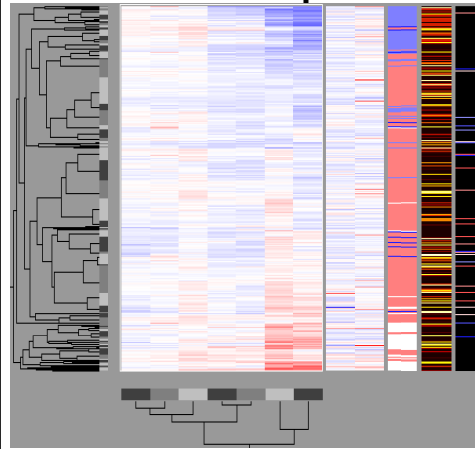
Visual Datamining

PCA



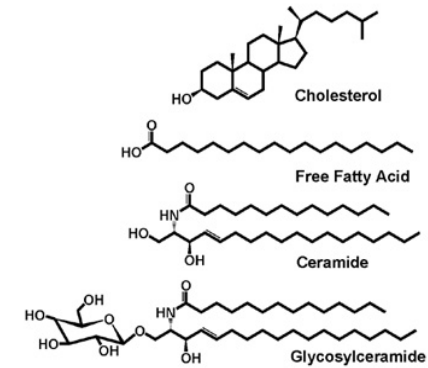
How is every patient related to every other?

Heatmap



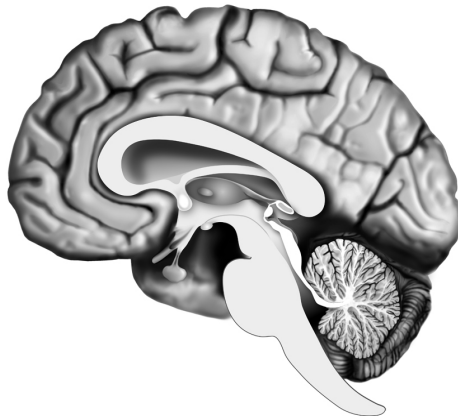
What is the range and distribution of values?

Chem. Structures



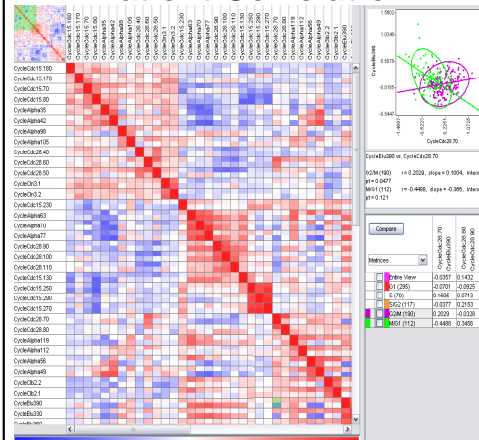
How are the Lipids/ compounds distributed in the data?

Brain Atlas



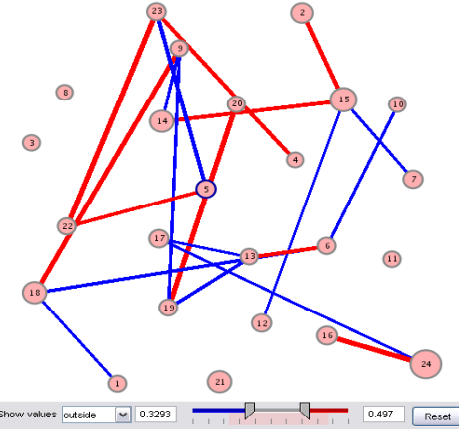
What are the major themes or concepts?

Patient Correlation



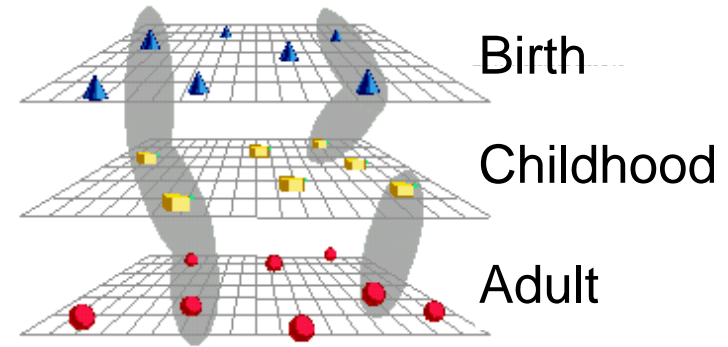
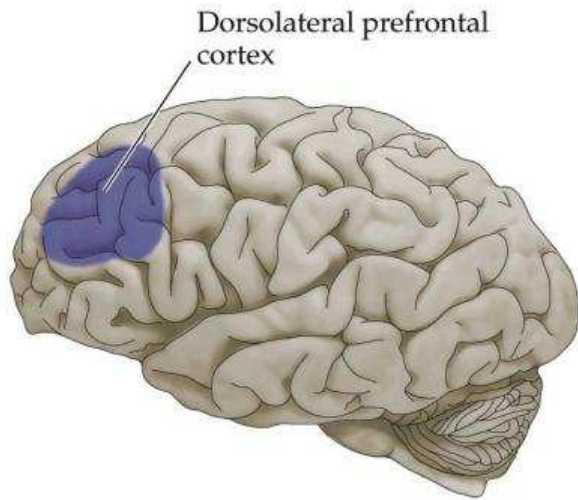
How are the numeric attributes correlated?

Pathway Networks

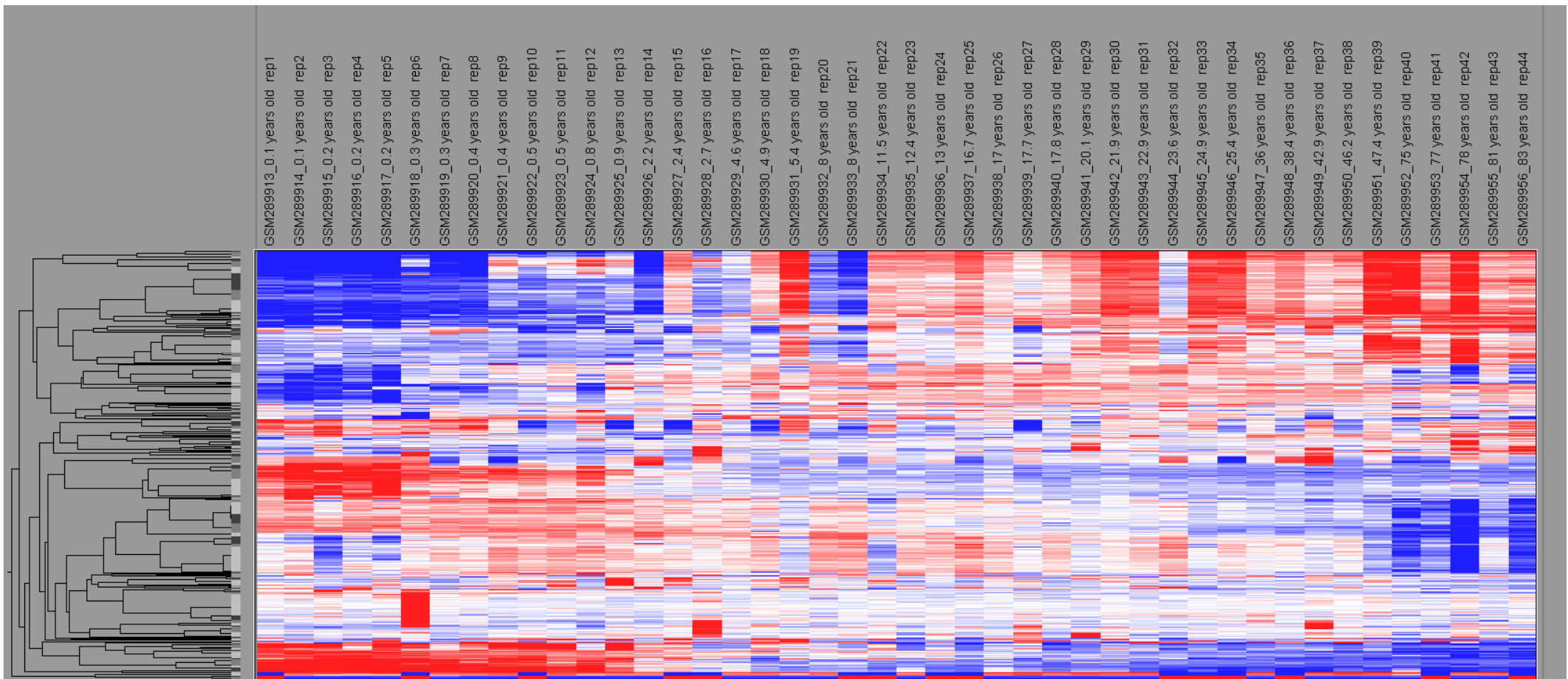


What are the supported regulatory relationships?

Development, Ageing & Cancer



Timed Molecular RNA Expression



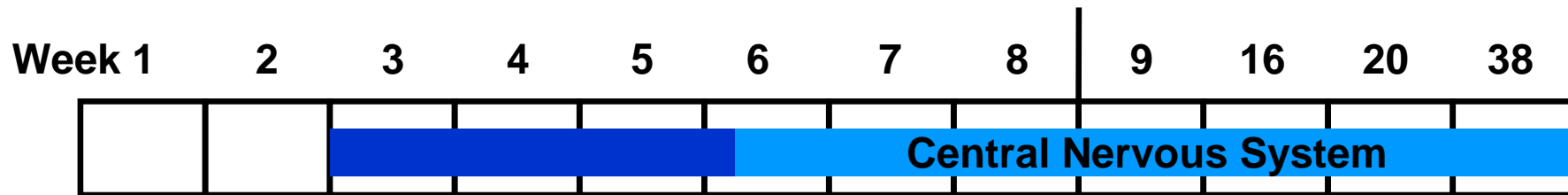
Molecular Imaging

- Genes, Development & Cancer -



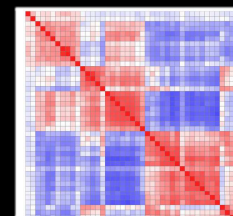
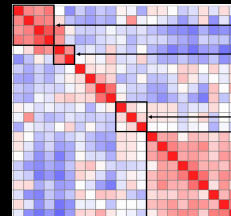
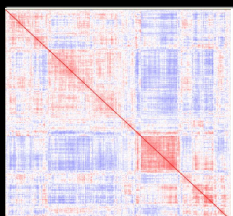
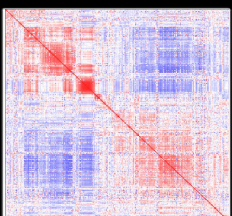
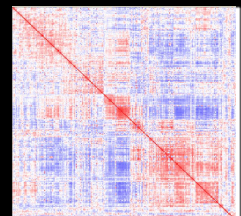
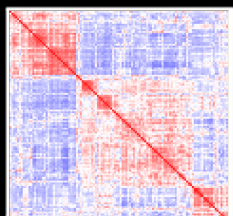
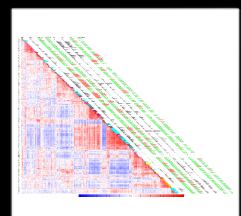
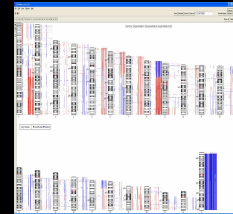
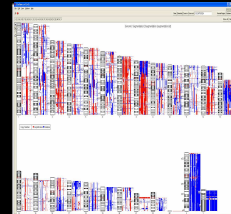
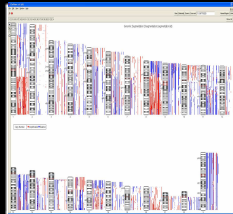
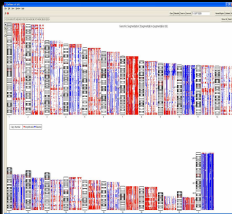
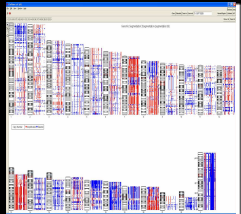
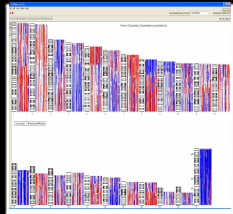
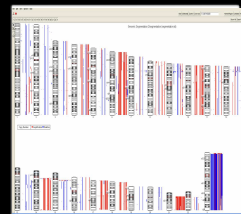
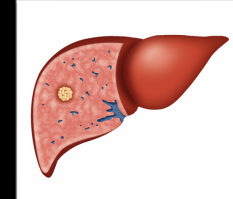
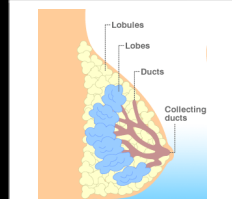
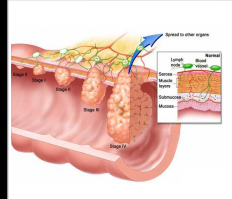
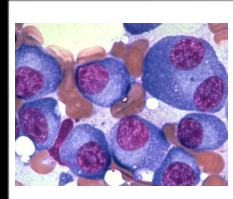
Neurodevelopmental Processes

- Time of Onset of Brain Malformations -

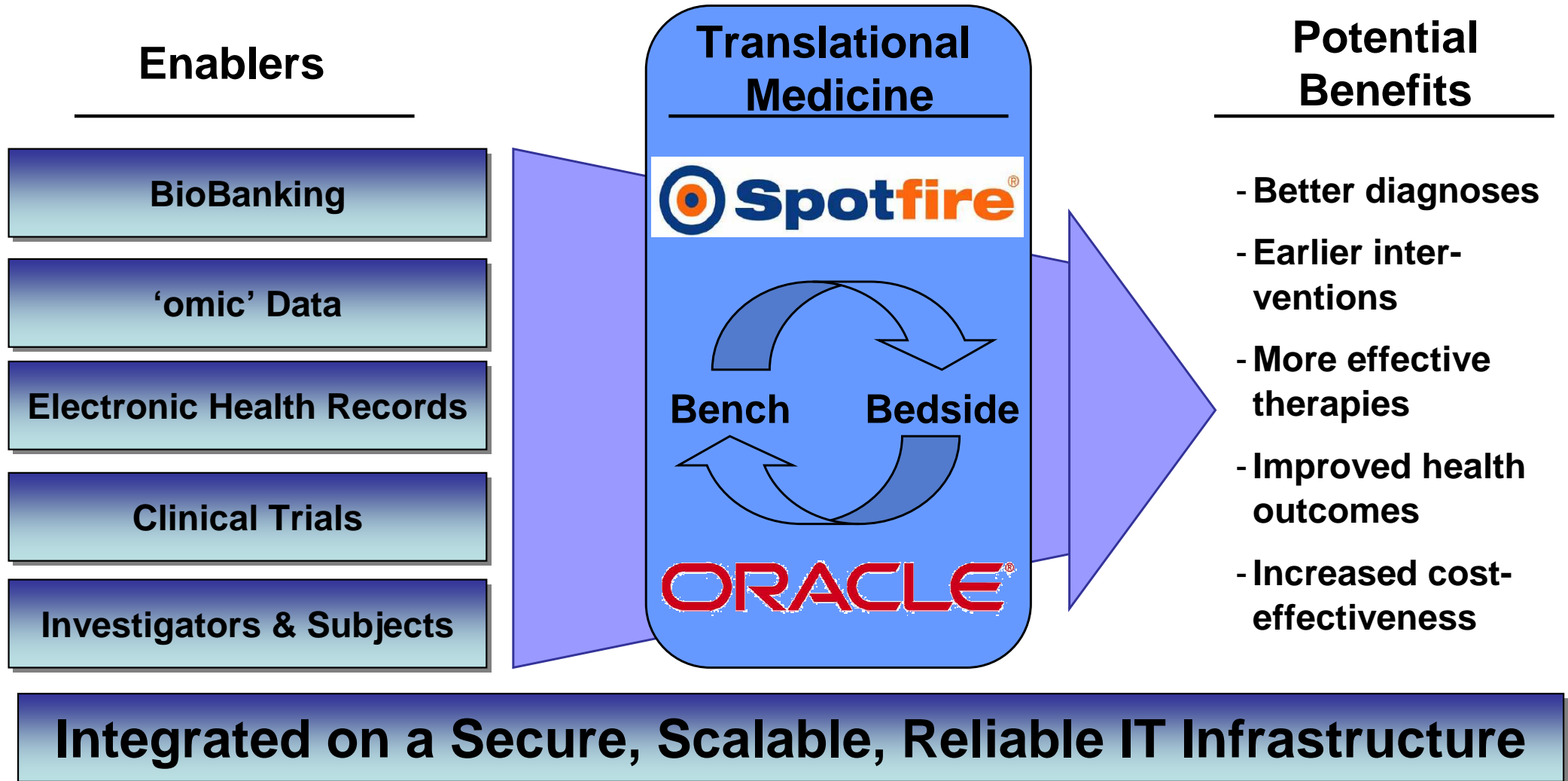


<u>Process</u>	<u>Malformation</u>	<u>Time</u>
Dorsal Induction	Neural Tube Defects	3-7 w.
Ventral Induction	Holoprosencephaly	5-6 w.
Neuronal Glial Proliferation	Micro/Megalencephaly	8-16 w.
Migration	Lissencephaly and heterotopia	12-20 w.
Organization	(Poly)microgyria, dysplasia	>24 w.
Myelination	Hypo/dysmyelination	>24w.-2 yr.

Cancer Heterogeneity Profiling



The Road Towards Translational Medicine



AML samples random order (n=285)

→ 285 AML patients

↓ 285 AML patients



Correlation view AML samples (n=285)

→ 285 AML patients

↓
285 AML patients



Leukemia Patient Stratification

- Correlation shows Genetic Heterogeneity in Patients -

Better Overall Survival
& Event Free Survival



The NEW ENGLAND
JOURNAL of MEDICINE

860 WINTER STREET, WALTHAM, MASSACHUSETTS 02451-1413 USA



Low number
of White
Blood cells

Dr. P. Valk, Prof. Dr. B. Löwenberg

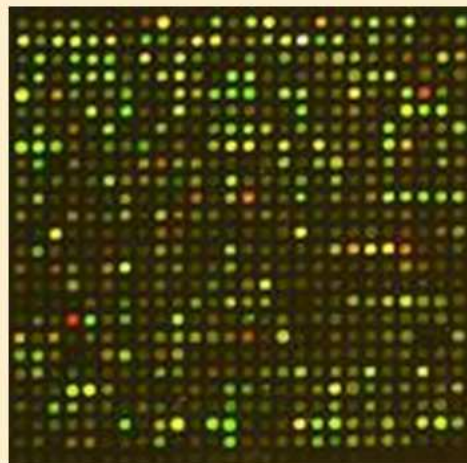




Skyline's Profilers



**Skyline develops
Personalized Diagnostics
(and Companion Diagnostics)
based on gene expression profiling**

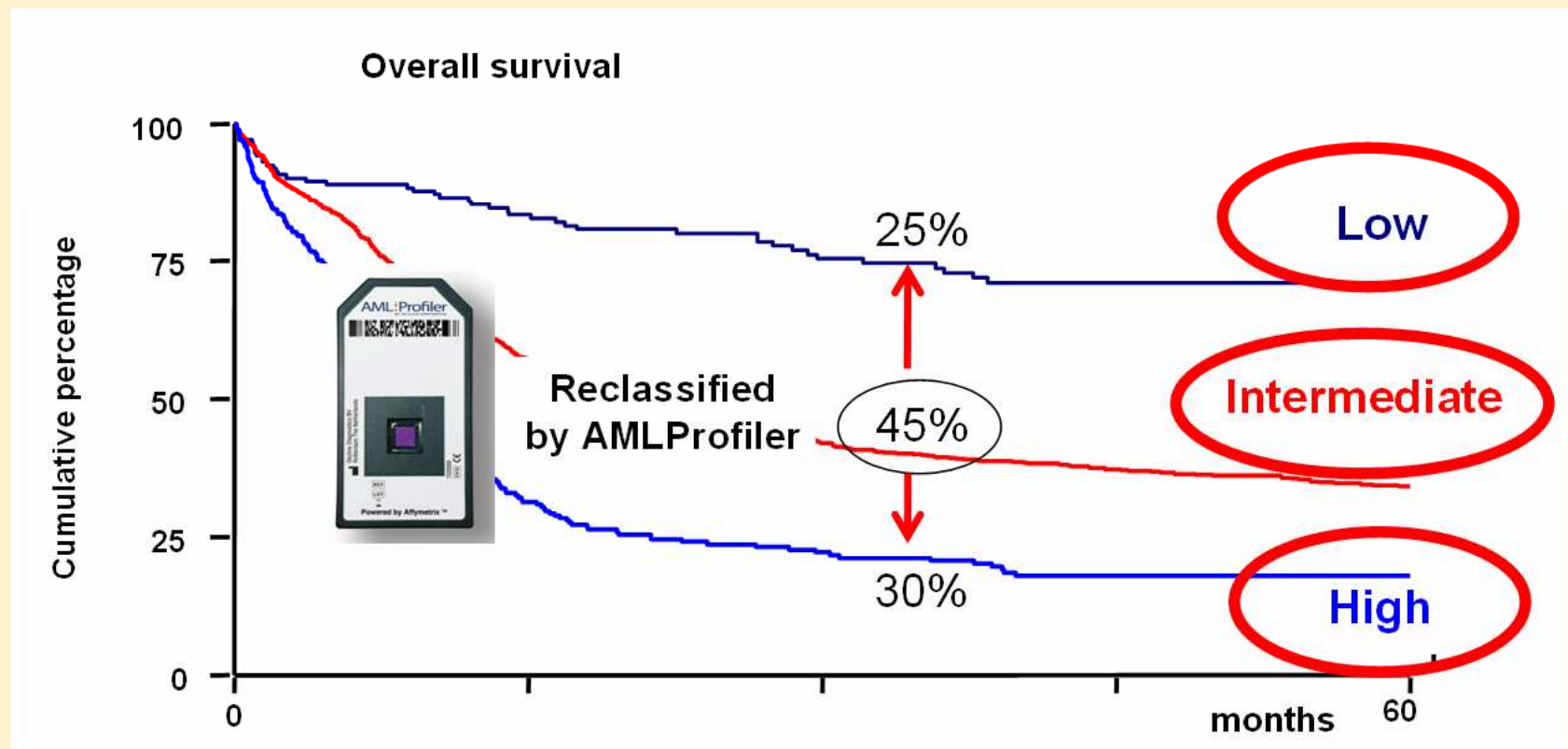


**Collaboration with
Erasmus University Medical Center
Rotterdam, The Netherlands**



Skyline's AMLProfiler

30% of Intermediate group can be reclassified by using Skyline's AMLProfiler

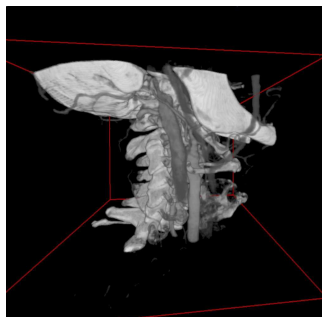


Conclusion

- Disease & Data Management -
- Need Biobanks for Personalized Healthcare -



**New opportunities
for disease
management**



- Classifying biological subgroups
- Identifying novel targets for therapy
- Companion diagnostics for directed therapy
- Assessing and managing risk



Erasmus Center for Bioinformatics

a department of Erasmus MC
University Medical Center Rotterdam

www.erasmusmc.nl/bioinformatics