Overview and benchmarking of signaling pathway resources

Dénes Türei

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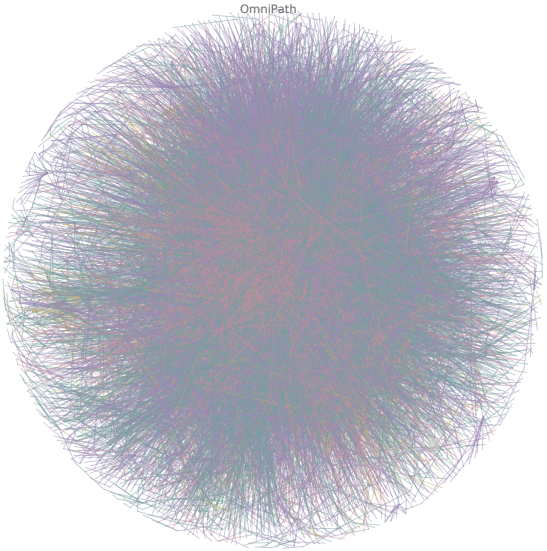
Overington group (EMBL Hinxton)
Gavin group (EMBL Heidelberg)

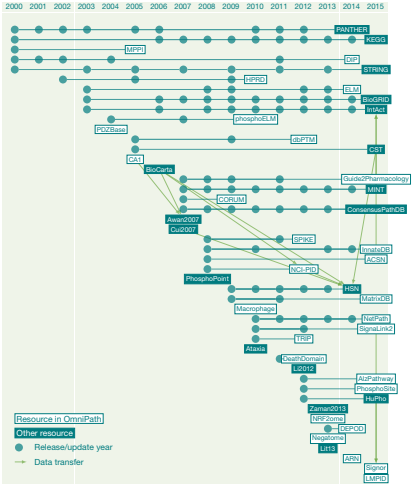
EMBL-EBI

25th November 2015

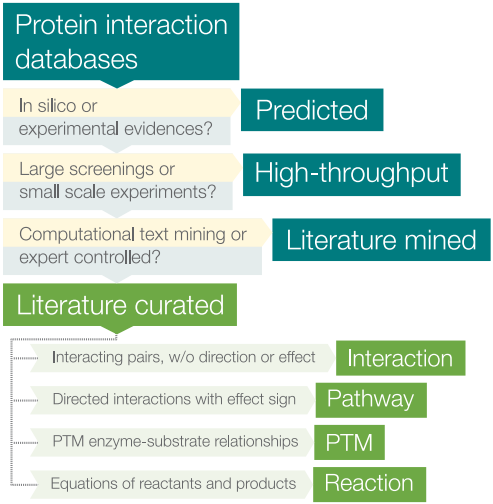
Sources of signaling data



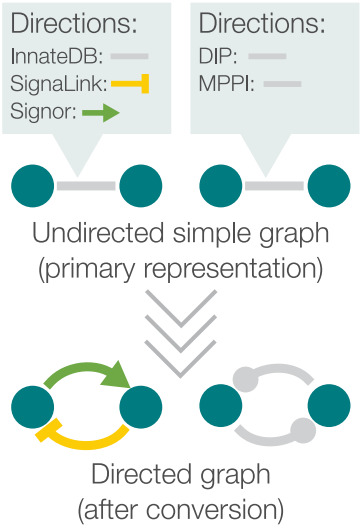
Sources of signaling data



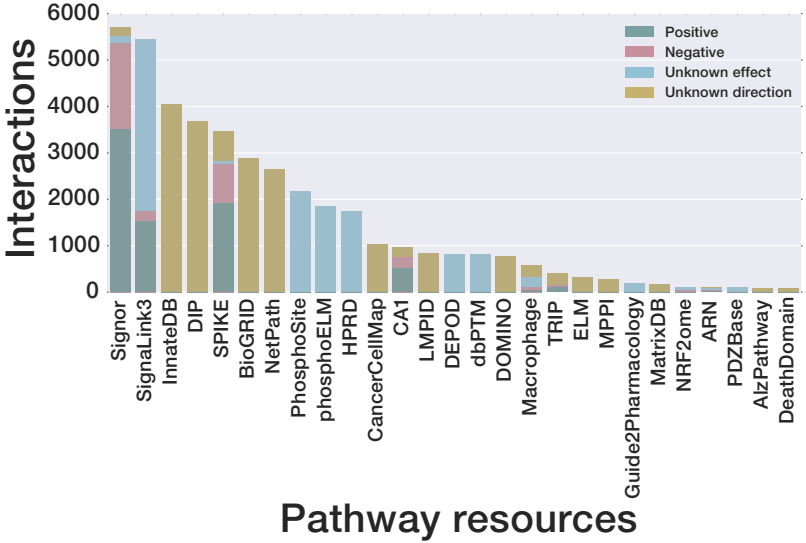
Sources of signaling data



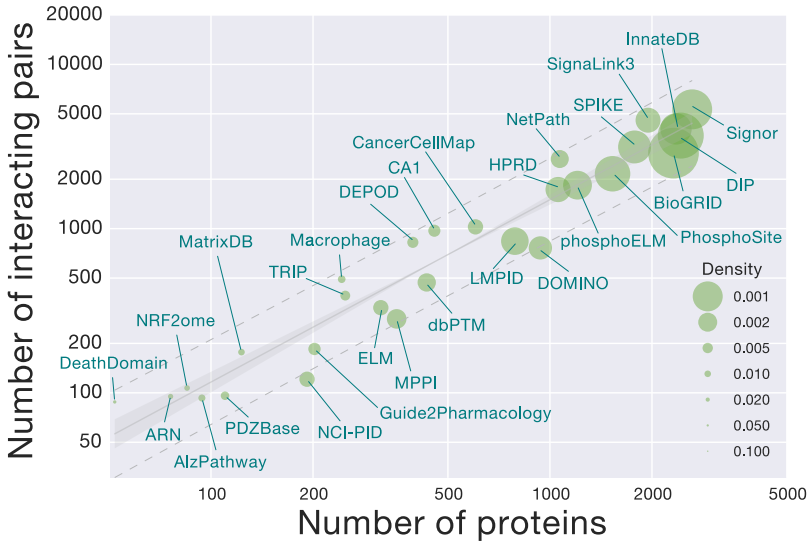
Directions and effects



Directions and effects



Boundaries of our knowledge



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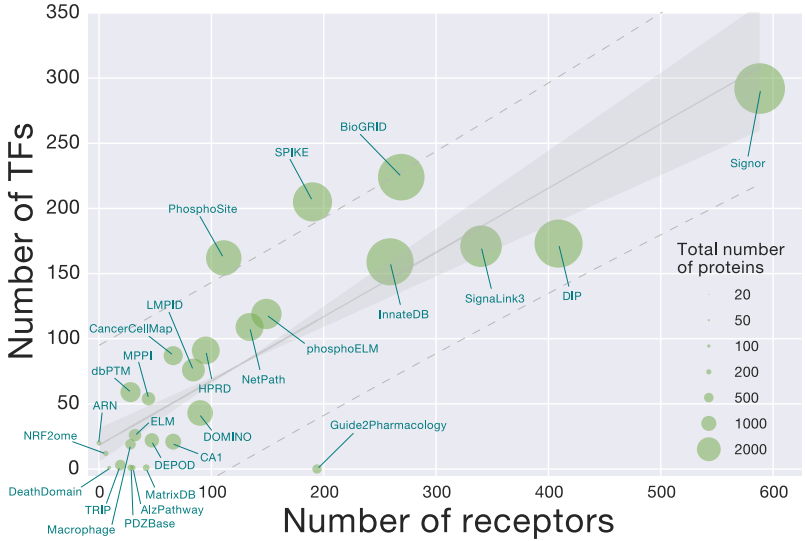

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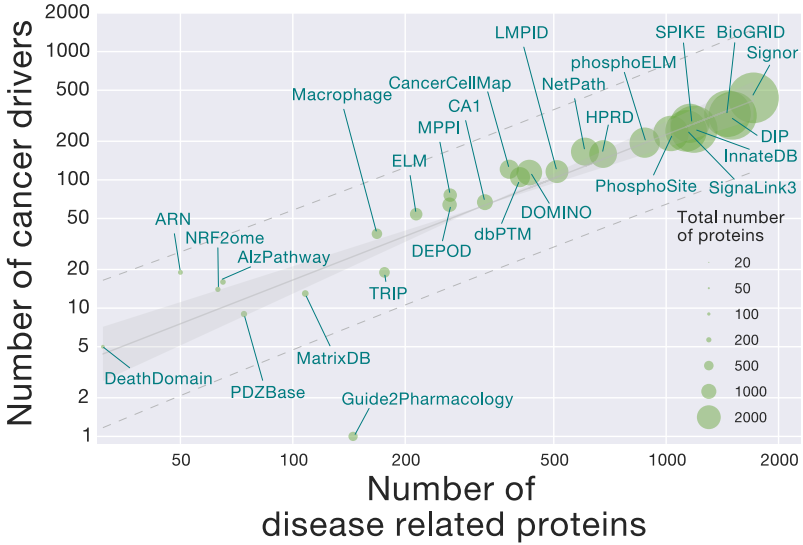

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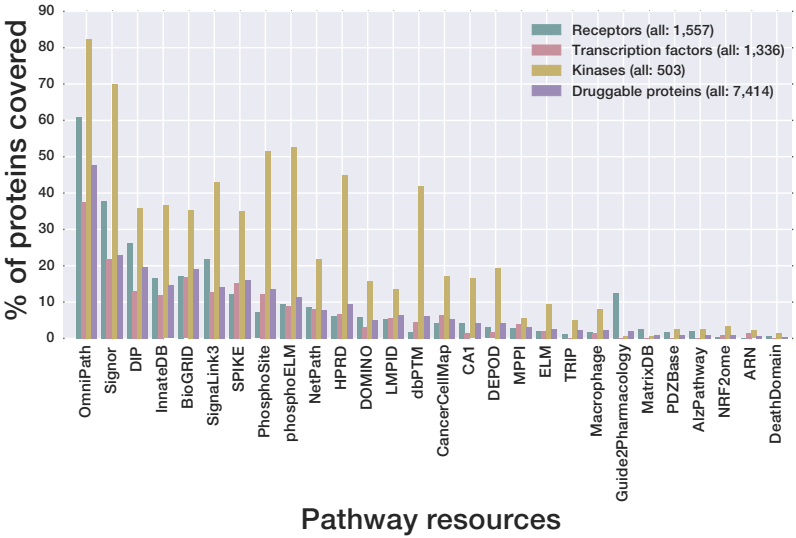

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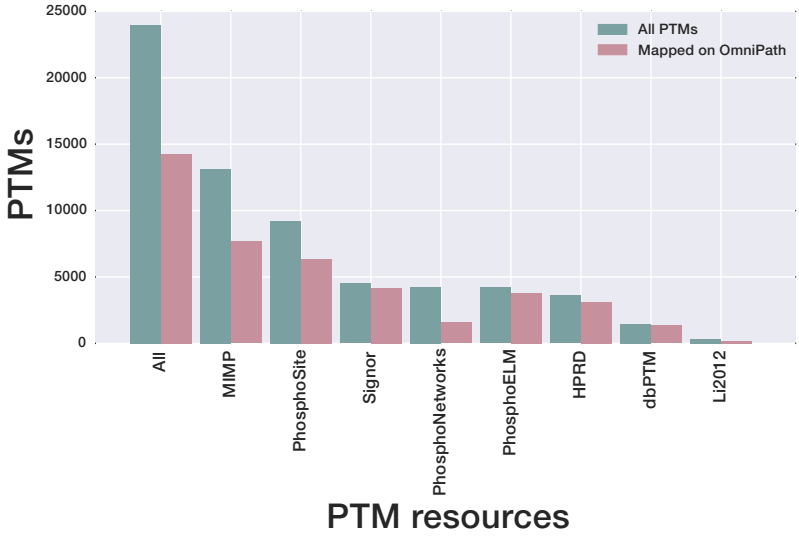
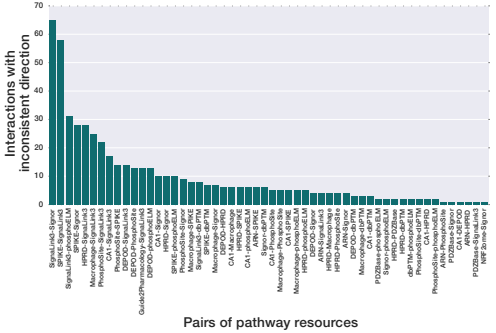
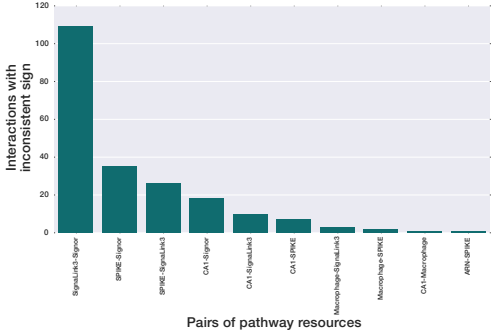
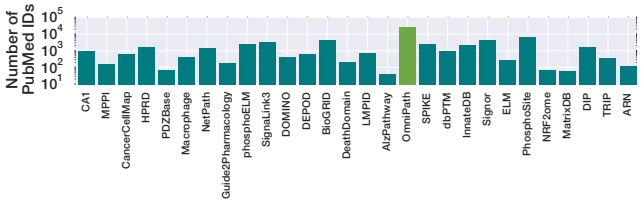


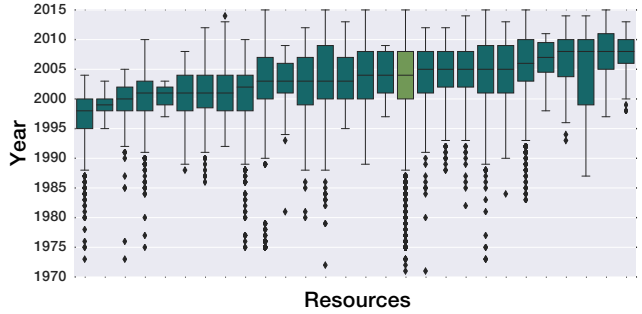
Inconsistencies





Tedious work of curators





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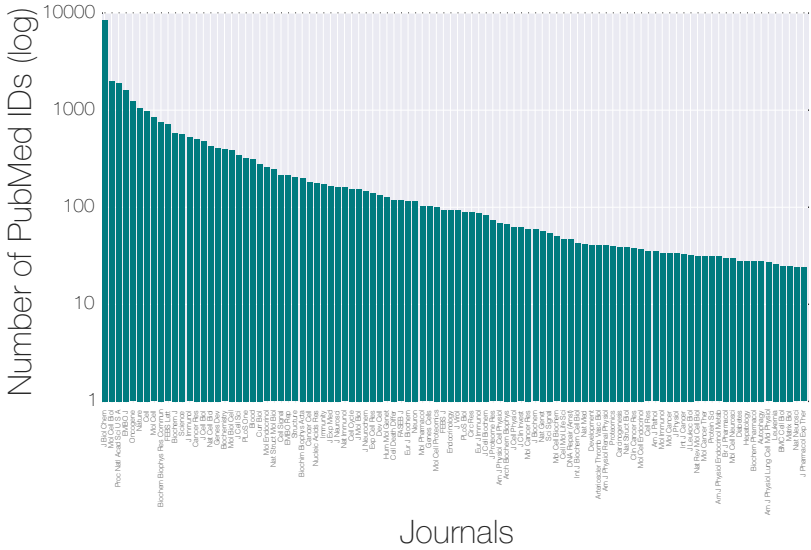
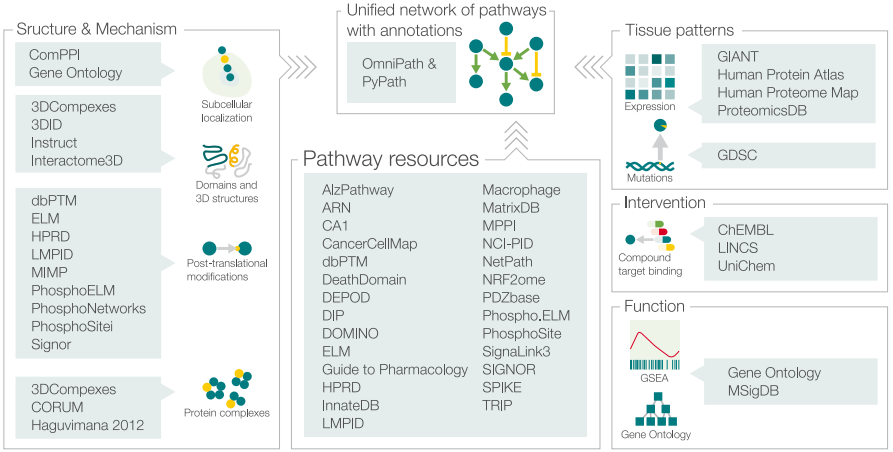
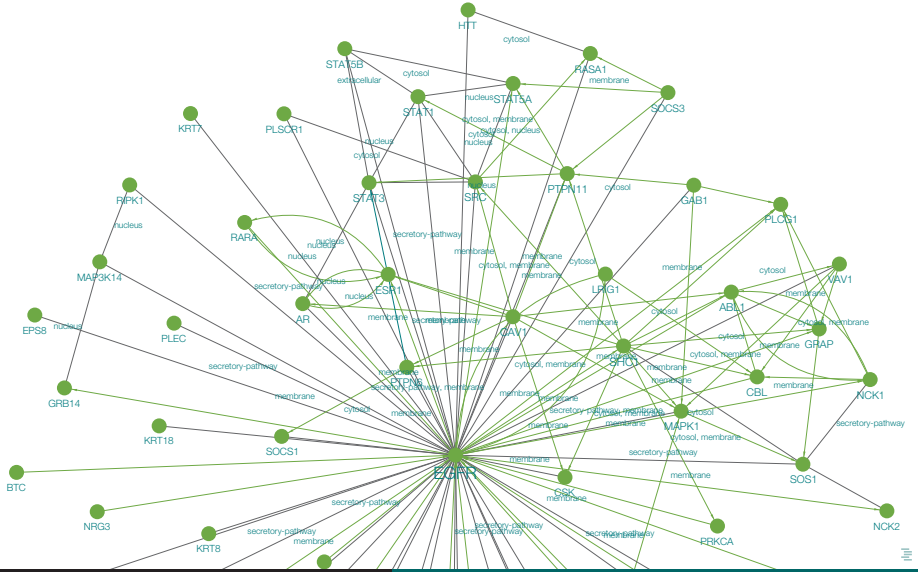


Data integration



Localization



Structure data

3DID
Instruct
Domino
3DComplexes

Domain-domain
for 1,381 interactions

Domain-motif
for 6,168 interactions

PhosphoSite
phoshpoELM
iELM
Pepcyber
Domino

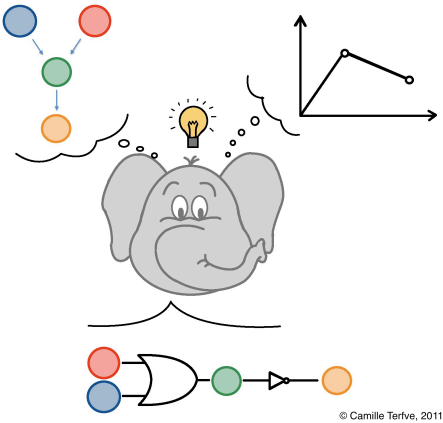
PISA
3DID
3DComplexes

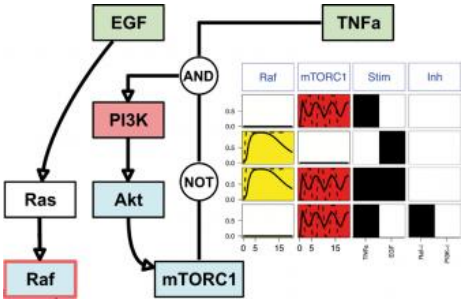
Residue level

PTMs: 33,051 PTMs,
in 6,046 interactions;
3,355 phosphorylations
in 954 interactions

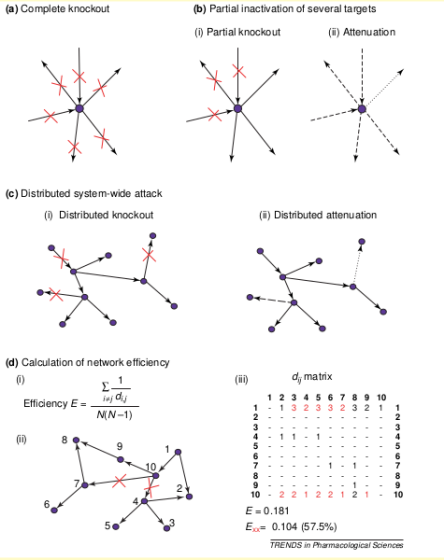
PhosphoSite
phoshpoELM

Applications I. – PKN for logic models





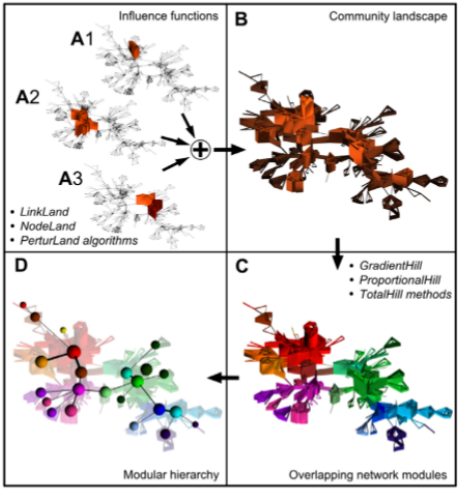
Applications II. – Network topological methods



The efficiency of multi-target drugs: the network approach might help drug design

Péter Csermely[1], Vilmos Ágoston[2] and Sándor Pongor[2,3]

Applications III. – Community detection methods



Steps of the ModuLand method family

Community Landscapes: An Integrative Approach to Determine Overlapping Network Module Hierarchy, Identify Key Nodes and Predict Network Dynamics

István A. Kovács[1,2], Robin Palotai[1], Máté S. Szalay[1], Peter Csermely[1]*

Applications IV. – Perturbation propagation in networks

OPEN ACCESS Freely available online

PLOS ONE

Perturbation Centrality and Turbine: A Novel Centrality Measure Obtained Using a Versatile Network Dynamics Tool

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Department of Medical Chemistry, Semmelweis University, Budapest, Hungary

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