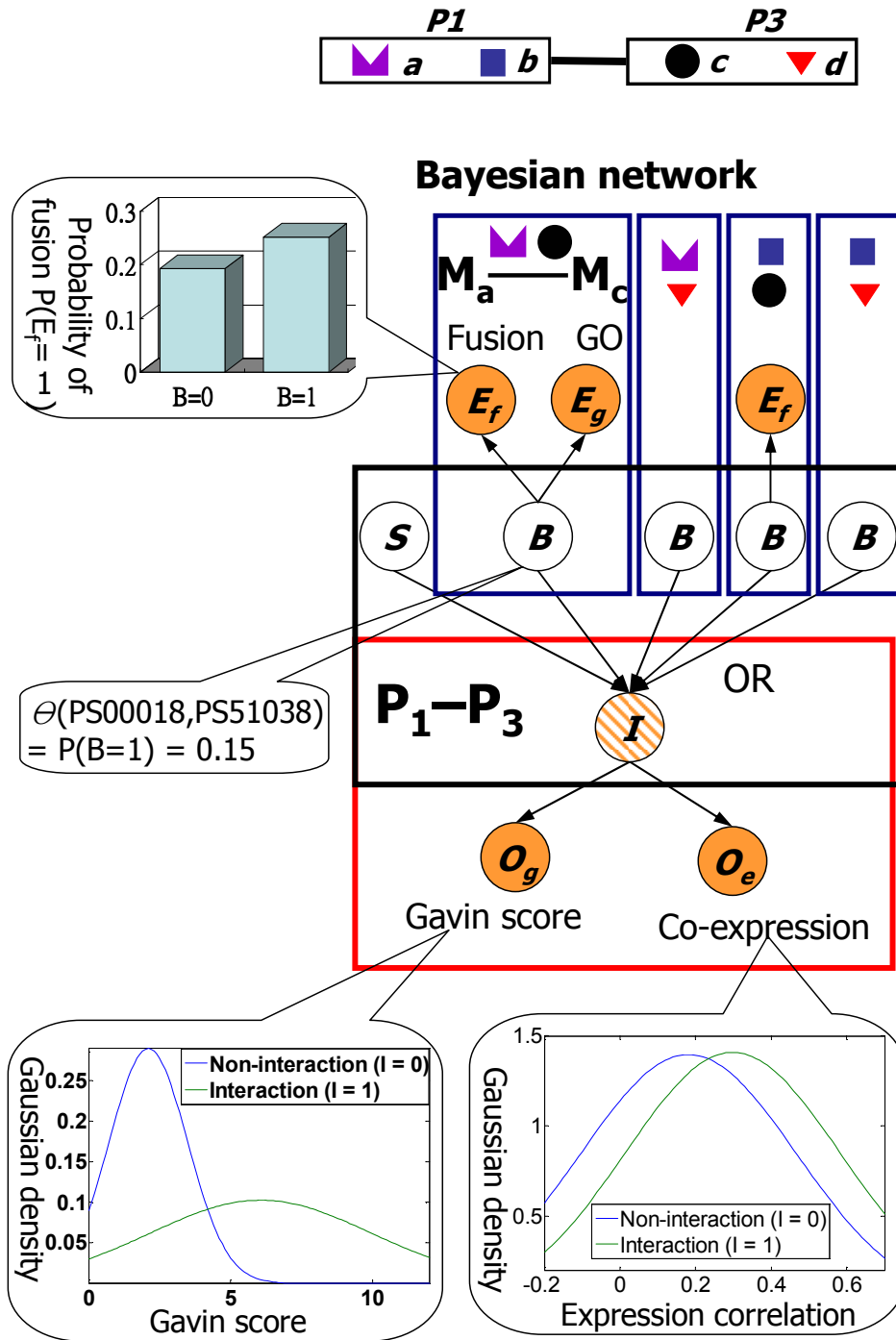


Supplementary Figure S1



Supplementary Figure S2

EM Learning algorithm

Observed: **O**, **E**, partial **I**

Hidden: **B**, **S**, partial **I**

Repeat:

Estimation of:

- motif affinities (θ)
- noisy observation models (η)
 - protein-protein interactions
 - domain-domain interactions

E step



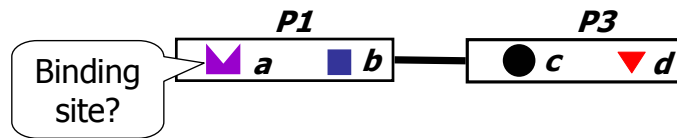
M step



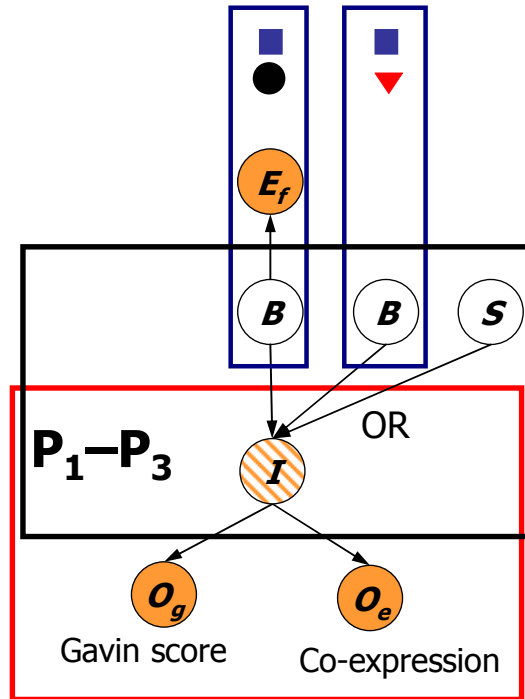
Soft assign to:

- **B**, **S**, **I**

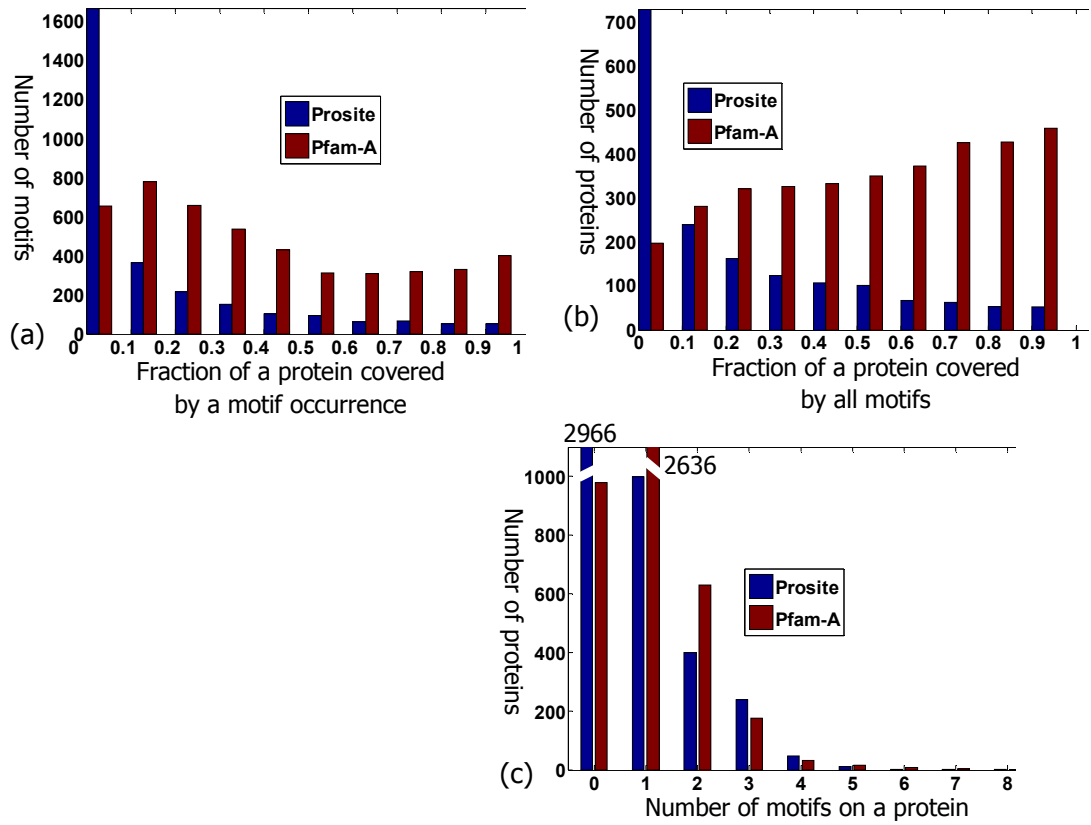
Supplementary Figure S3



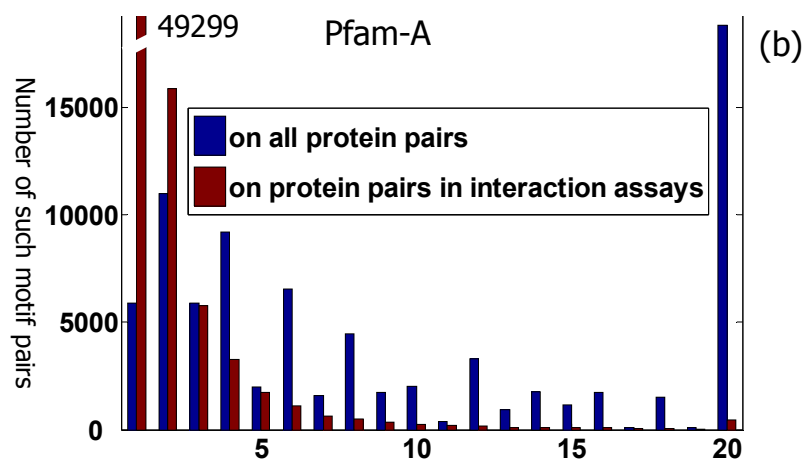
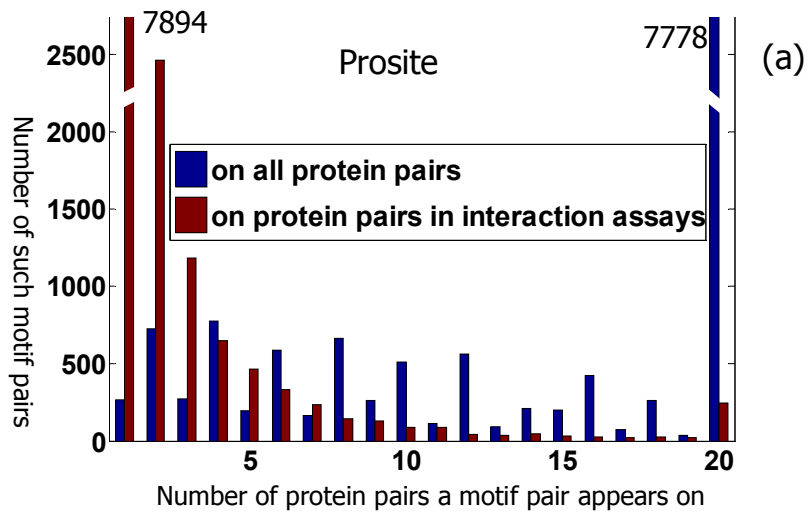
Bayesian network



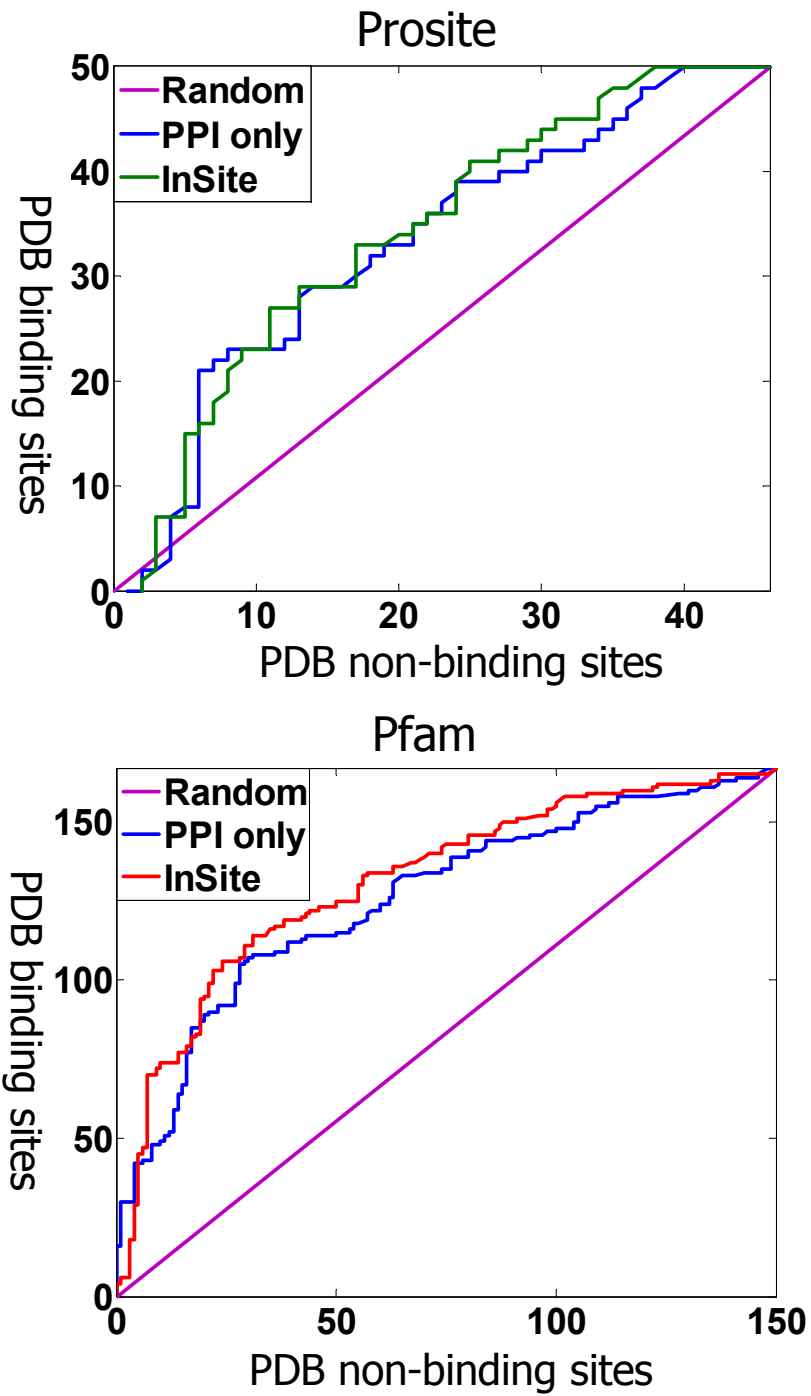
Supplementary Figure S4



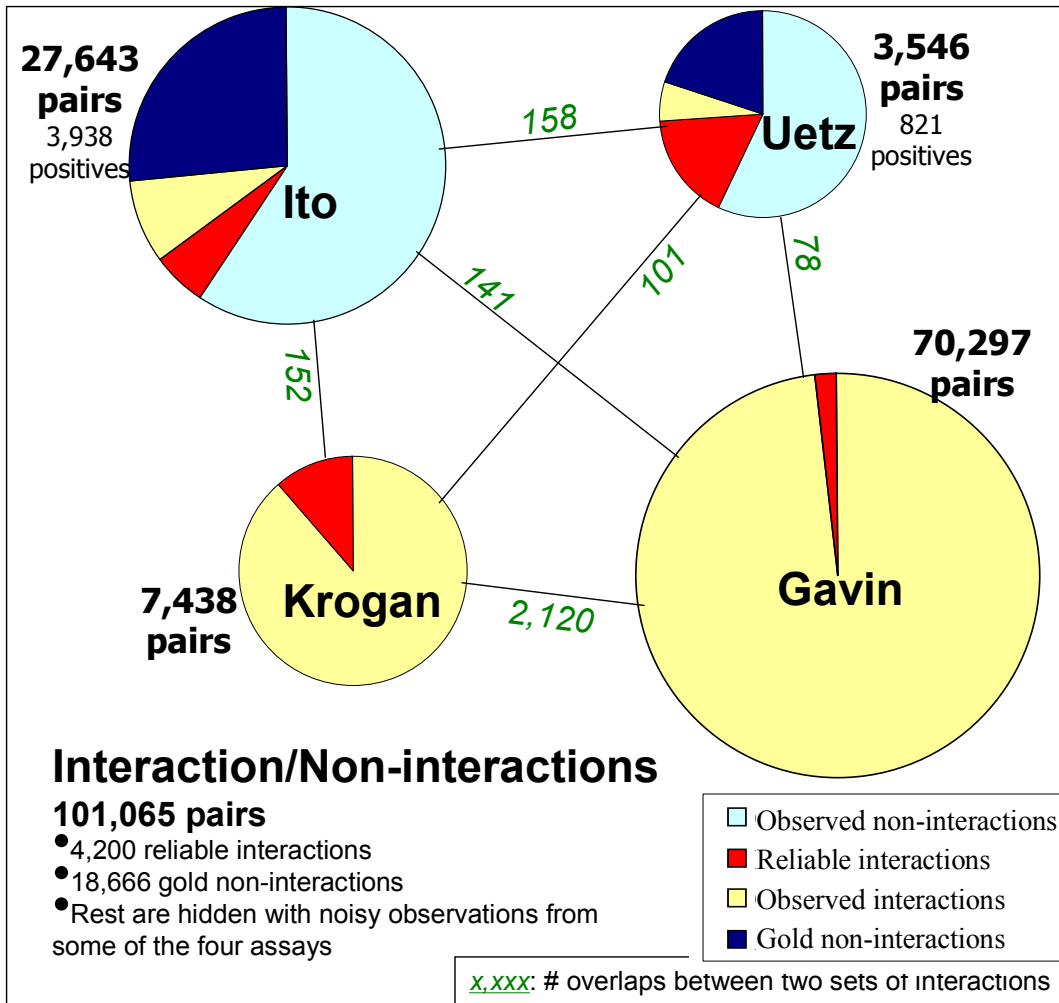
Supplementary Figure S5



Supplementary Figure S6



Supplementary Figure S7



Supplementary Figure S8