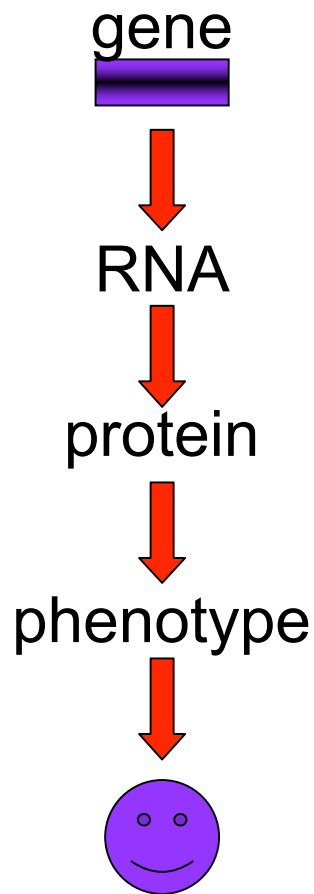


What's the difference between genetics and genomics?

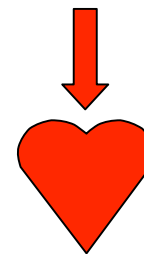
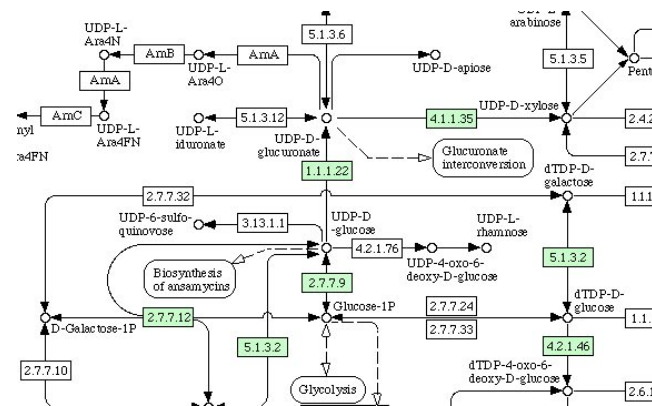


genetics: study one gene at a time and understand how it works.

What's the difference between genetics and genomics?

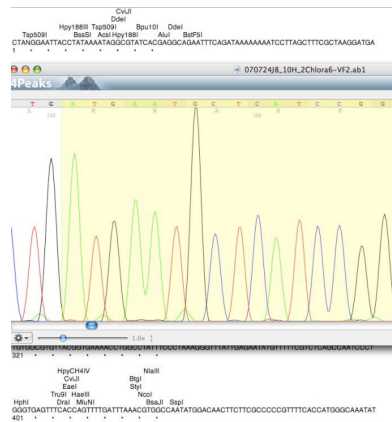
every gene
(~25,000 humans)

genomics: study all genes simultaneously and understand how they work collectively.

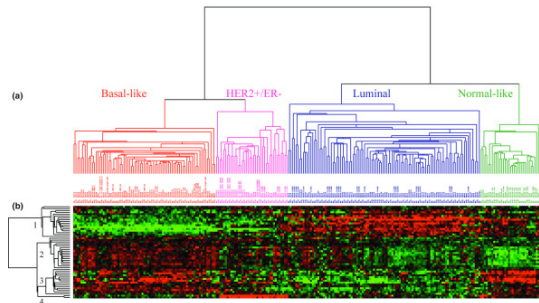


model complex system

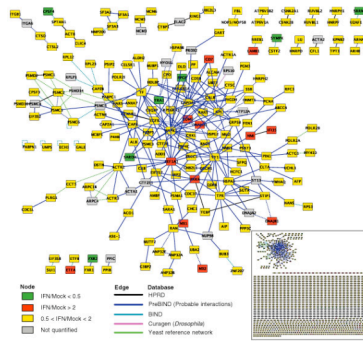
What does math have to do with genomics?



Validate & understand data



Uncover new patterns

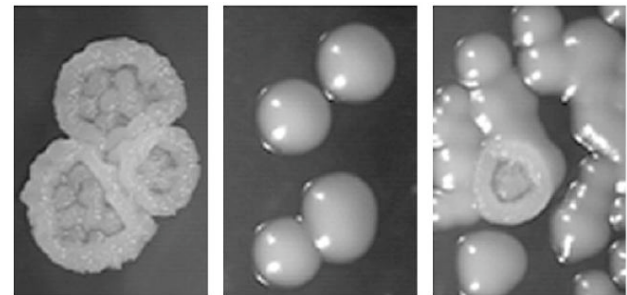
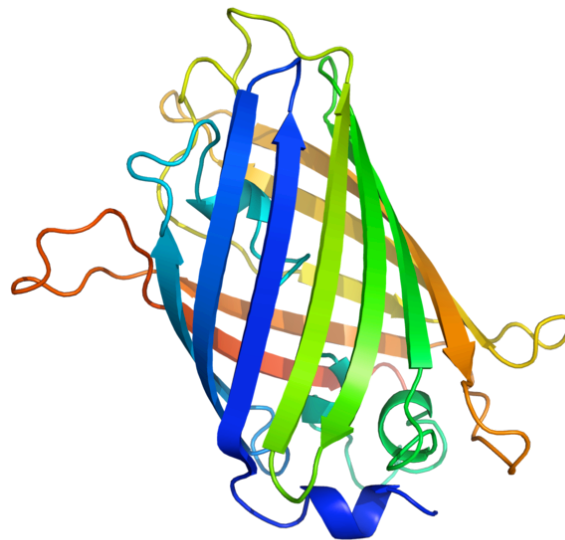
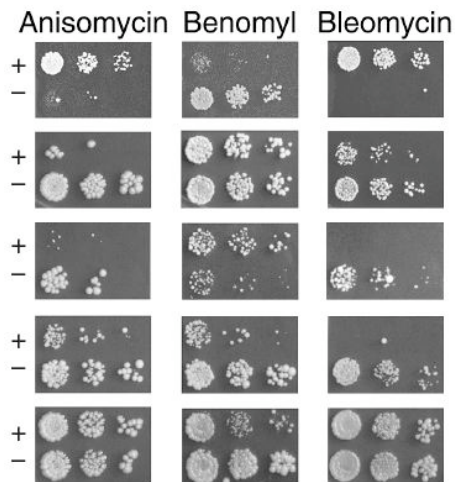


Visualize relationships

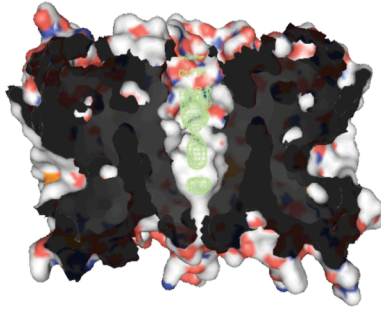
What is proteomics?

(100,000 - 200,000 humans)

proteomics: study all proteins
and understand how they work.

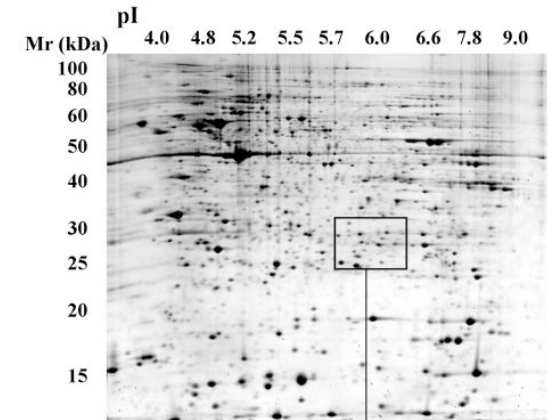


What is proteomics?

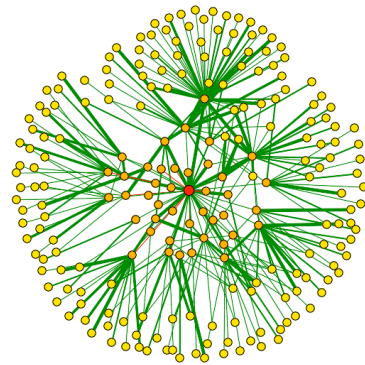


Understand protein structures

ID all proteins

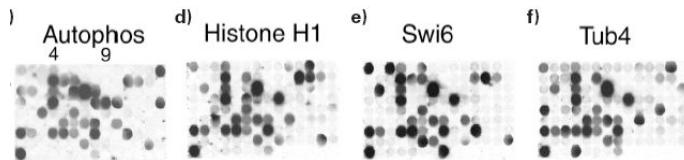


Protein interactions



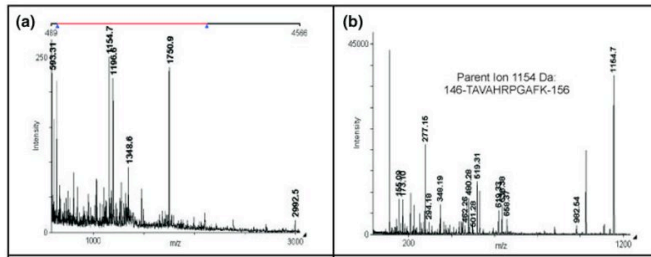
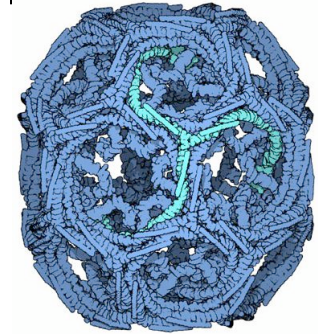
LEGEND

Protein modifications

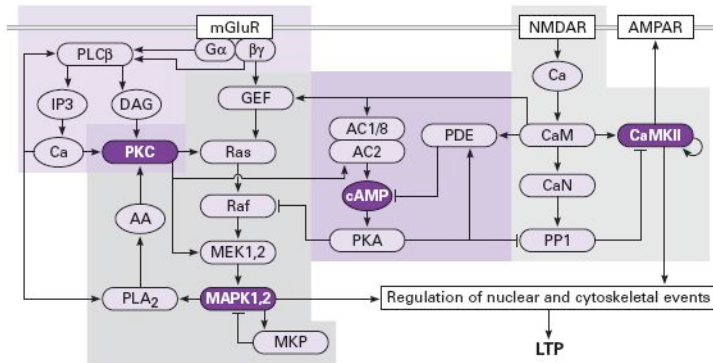


What does math have to do with proteomics?

Predict protein folding



Algorithms for high throughput data



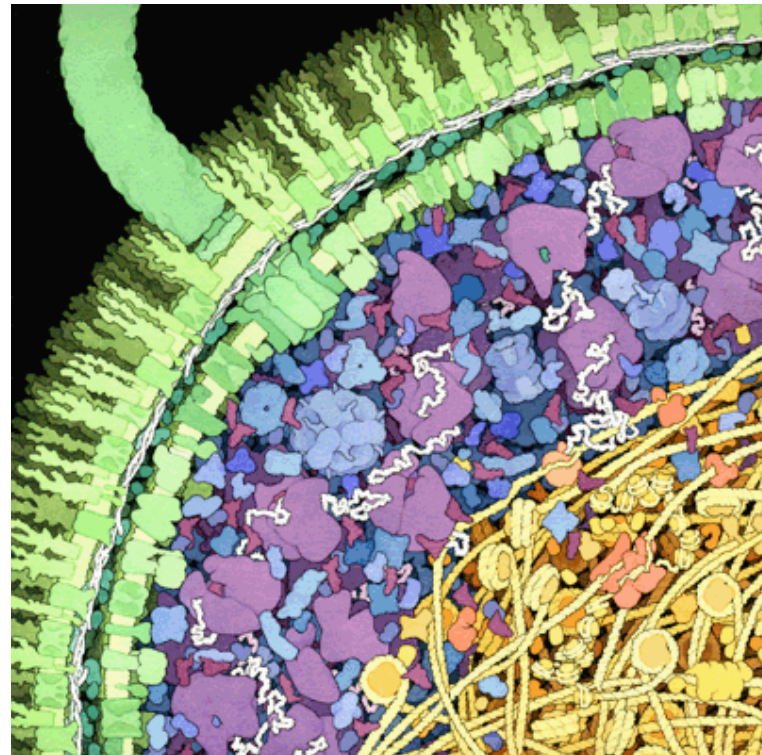
Construct models

Find amino acid patterns

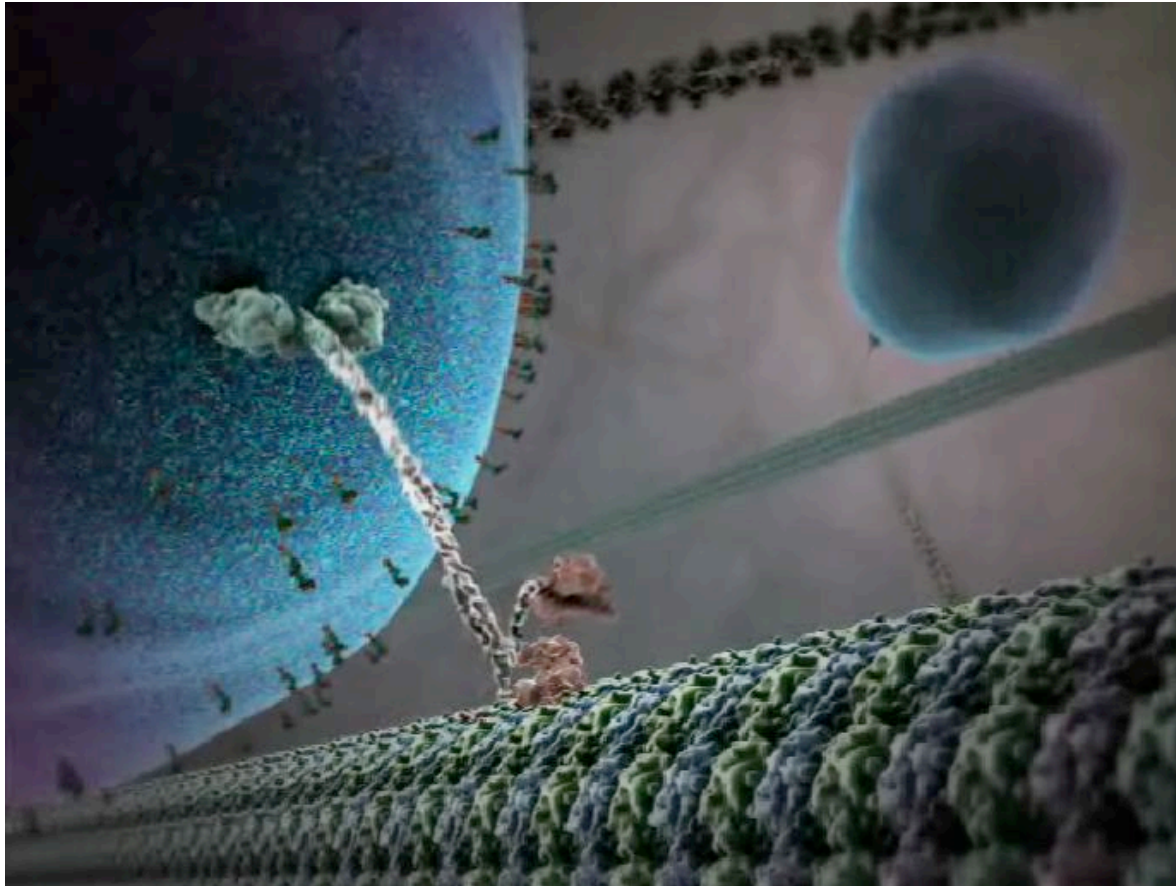


What is systems biology?

Systems biology : study all genes, proteins, lipids, carbohydrates, ions,.....and how they work together!



What doesn't math have to do with systems biology?



<http://aimediaserver.com/studiodaily/harvard/harvard.swf>