

Module 2: Expression Engineering

20.109

Lecture 7

November 1st, 2007

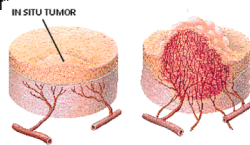


Sparks of inspiration



Judah Folkman
1950s Surgical Resident MGH

"the warmth of tumors made him wonder whether they, like the other tissue in the body, needed their own blood supply and whether they could be starved if that blood supply was cut off"



Genome-wide genotype analysis

AMD: Age-related Macular Degeneration

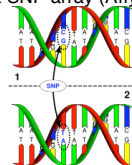
15 million people in the US suffer from AMD

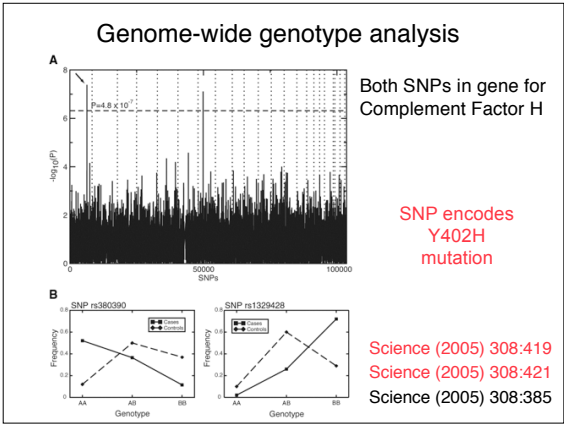
is expected to double as baby boomers age

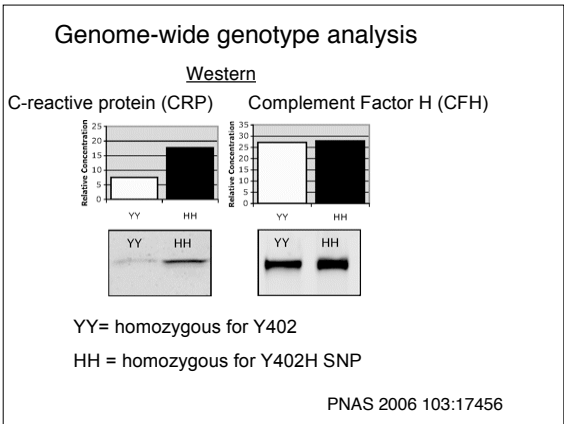
50 unaffected

96 patients

100K SNP array (Affymetrix)







Genome-wide phenotype analysis

Arrays for RNAi drug discovery

The RNAi Consortium

In a three-year, \$18 million initiative, the TRC will create a library of materials to conduct RNAi experiments on 15,000 human genes and 15,000 mouse genes. A total of 150,000 custom-designed plasmids that express short and unique pieces of RNA (known as short hairpin RNAs or shRNAs) that target specific genes will be created and validated. This fundamental resource will be made available to scientists worldwide through commercial and academic distributors.

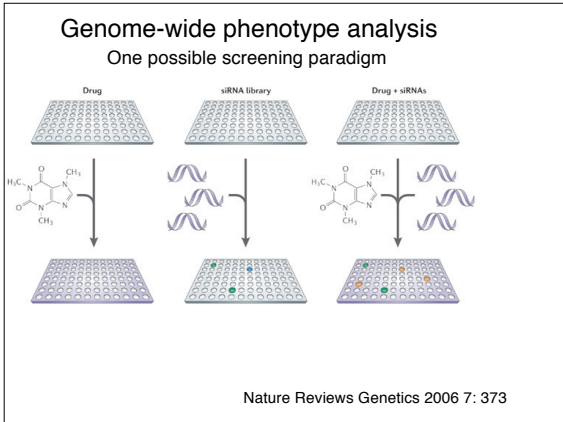
Features:

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automated

collaborative

grow at RT
ambient CO₂
no lipid needed for txn

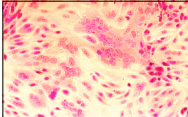


Genome-wide phenotype analysis



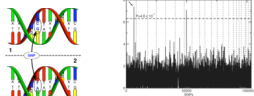
Respiratory Syncytial Virus (RSV)

- ssRNA enveloped virus of the Paramyxovirus family
- Responsible for 50-90% of Bronchiolitis and 5-40% of Bronchopneumonia in infants
- RSV fusion protein allows virus to fuse with host cells, and then fuses neighboring cells into multinucleated masses



Summary

Arrays for

1. Genotyping: SNP ID --> AMD
 
2. Phenotyping: TRC --> RSVs
 