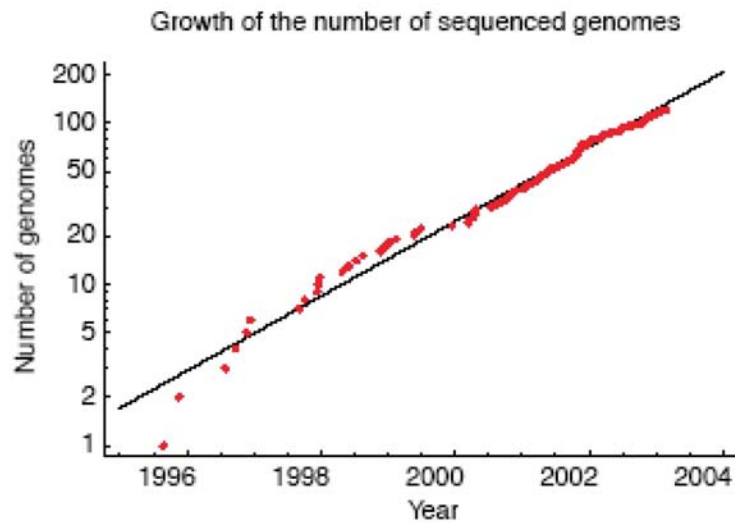


Introduction to Genomics

- Genomics is a continuation of the fields of molecular biology and genetics, but now at the scale of whole genomes. Some of the goals of genomics include:
- Assemble physical and genetic maps of the genome of interest.
- Generate and order genomic and expressed gene sequences.
- Identify and annotate the complete set of genes encoded within a genome.
- Characterize DNA sequence diversity within a species, as well as comparison with other species.
- Compile atlases of gene expression and gene function data.

Genomics is growing exponentially



Approximate gene functions can be assigned at a whole-genome scale.

Table 1. Estimates for the exponents of a selection of functional categories^a

Category	Bacteria	Eukaryotes
Transcription regulation	1.87 ± 0.13	1.26 ± 0.10
Metabolism	1.01 ± 0.06	1.01 ± 0.08
Cell cycle	0.47 ± 0.08	0.79 ± 0.16
Signal transduction	1.72 ± 0.18	1.48 ± 0.39
DNA repair	0.64 ± 0.08	0.83 ± 0.31
DNA replication	0.43 ± 0.08	0.72 ± 0.23
Protein biosynthesis	0.13 ± 0.02	0.41 ± 0.15
Protein degradation	0.97 ± 0.09	0.90 ± 0.11
Ion transport	1.42 ± 0.28	1.43 ± 0.20
Catabolism	0.88 ± 0.07	0.92 ± 0.08
Carbohydrate metabolism	1.01 ± 0.11	1.36 ± 0.36
Two-component systems	2.07 ± 0.21	NA ^b
Cell communication	1.81 ± 0.19	1.58 ± 0.34
Defense response	NA ^b	3.35 ± 1.41

^aThe first number gives the maximum likelihood estimate of the exponent and the second number indicates the boundaries of the 99% posterior probability interval.
^bNA, not analyzed.

