



CONSORTIUM FOR COMPARATIVE GENOMICS

University of Colorado School of Medicine

Sequence Assembly and Next Generation Sequencing

BIOL 7711 Computational Bioscience

Biochemistry and Molecular Genetics
Computational Bioscience Program
Consortium for Comparative Genomics
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Computation on Nucleotides

- Alignment--generally more uncertain than amino acids
 - Occasionally provides a more correct answer
- Sequence Assembly
- Sequence Annotation
 - Genes, splice sites
 - Regulatory regions, TFBS
 - Chromatin binding
- Mutation processes
- Route to information much faster, cheaper

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 - **High-throughput next-generation sequencing**

The Evolution of Sequencing

- Sanger sequencing
 - Gels
 - Cycle sequencing
 - Fluorescence
 - Capillary electrophoresis
- Sequencing, the “Next Generation”
 - “Sequencing by synthesis”
 - Pyrosequencing (Roche/454)
 - Cluster sequencing (Illumina/Solexa)
 - Sequencing by ligation (ABI/SOLiD)