

Introducción a la Bioinformática:

Algoritmos Bioinformáticos

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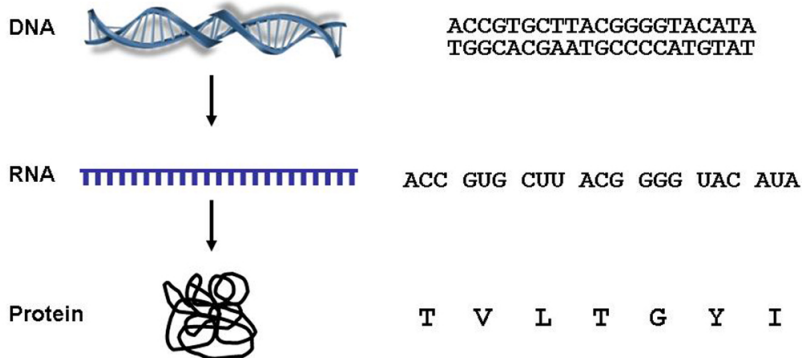
Doctorado en Ingeniería
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Contenido

- Dynamic programming: Needleman-Wunsch, Smith-Waterman, and alignment heuristics
- Weight matrices: Sequence weighting, pseudo count correction for low counts, Gibbs sampling, and Psi-Blast Modelos
- Data redundancy and homology reduction: Hobohm and other clustering algorithms.
- Hidden Markov Models: Model construction, Viterbi decoding, posterior decoding, and Baum Welsh HMM learning
- Fragment-Based Computational Protein Structure Prediction
- Neural Networks and Genetic Algorithms

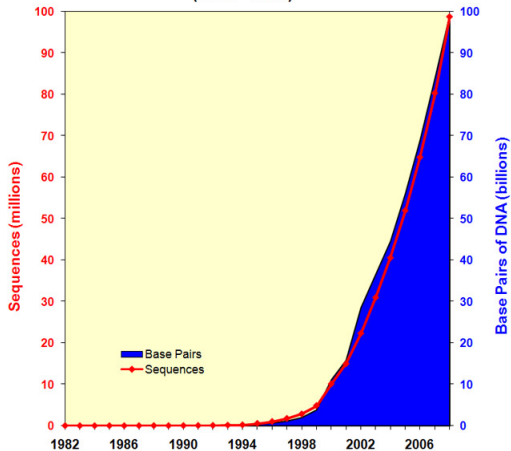
Secuencias Biológicas



<http://cureangelman.org/understanding-angelman/testing-101/>

Crecimiento Exponencial BD Biológicas

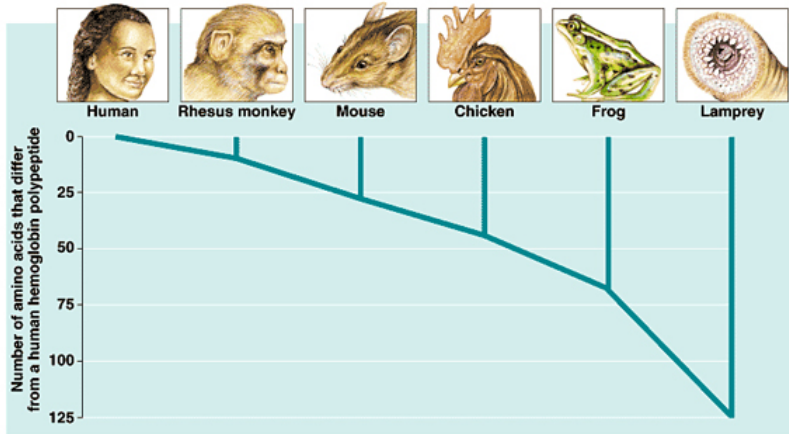
Growth of GenBank
(1982 - 2008)



<https://www.ncbi.nlm.nih.gov/genbank/genbankstats-2008/>

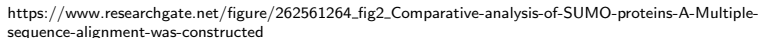
Y ahora qué?

Cuál es la Relación Evolutiva?



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<http://www.bio.miami.edu/dana/160/160S135.html>



Respuesta: Alineamientos de Secuencias

Unaligned sequences

Human	A	C	A	T	T	A	T	G	G	A	C	A	G	G	T	A	A	G	T	A	A	A	A	A	C	A	T	A	T	T
Chimpanzee	A	C	A	T	T	A	T	G	G	A	C	A	G	G	T	A	A	G	T	A	A	A	A	A	C	A	T	A	T	T
Macaque	A	T	A	T	A	C	A	T	T	A	C	G	G	A	C	A	G	G	T	A	A	G	T	A	A	A	A	C	A	T

Aligned sequences

Human	A	C	A					T	T	A	T	G	G	A	C	A	G	G	T	A	A	G	T	A	A	A	A	A	A	C	A	T	A	T	T
Chimpanzee	A	C	A					T	T	A	T	G	G	A	C	A	G	G	T	A	A	G	T	A	A	A	A	A	A	C	A	T	A	T	T
Macaque	A	T	A	T	A	C	A	T	T	A	C	G	G	A	C	A	G	G	T	A	A	G	T	A	A	A	A	A	A	C	A	T			

http://evolution.berkeley.edu/evolibrary/article/0_0_0/evotrees_build_04