

### Outline

- Genome sequencing
- *E. coli* genome
- Human genome

---

---

---

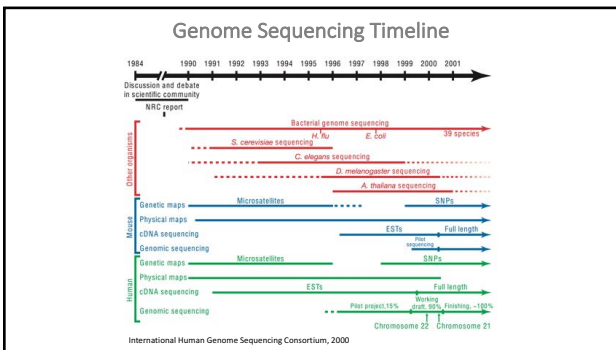
---

---

---

---

---




---

---

---

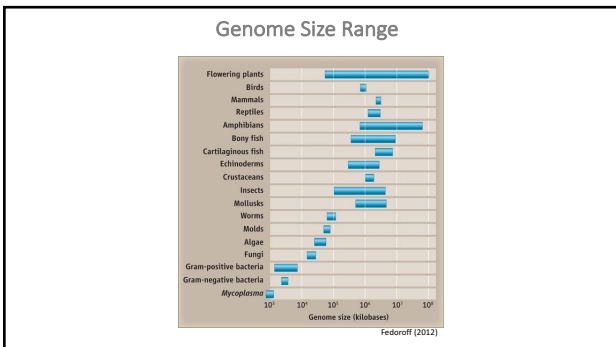
---

---

---

---

---




---

---

---

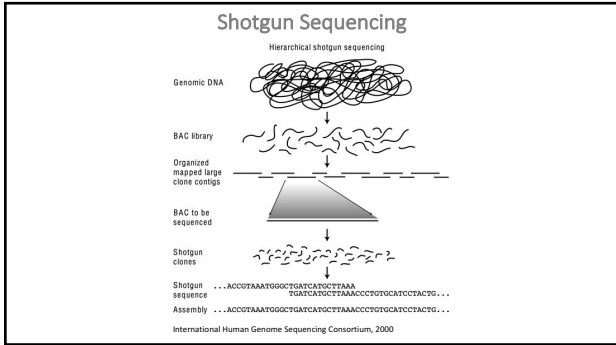
---

---

---

---

---




---

---

---

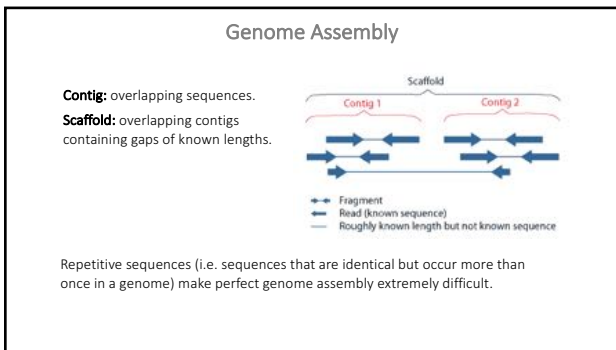
---

---

---

---

---




---

---

---

---

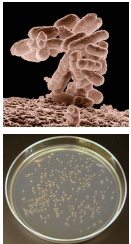
---

---

---

---

### The *E. coli* Genome



**Stats:**

- Published in 1997
- Chromosomes: 1 (circular)
- Size: 4.6 million bp
- Protein-coding genes: 4,466
- Transposons: Yes
- Pseudogenes: Yes
- tRNAs: Yes
- rRNAs: Yes
- Small RNAs: Yes, but not the same as eukaryotic small RNAs
- Introns: No

---

---

---

---

---

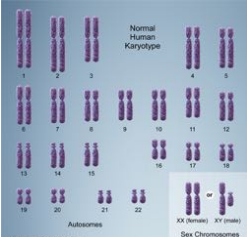
---

---

---

### The Human Genome

- Draft in 2001
- Complete in 2003
- Chromosomes: 23
- Size: 3.3 billion bps
- Coding genes: 20,805
- Pseudogenes: 14,181
- miRNAs: 1,756
- rRNAs: 530
- tRNAs: 497
- snRNAs: 1,944
- snoRNAs: 1,521
- lncRNAs: 9,277?
- ~65% repetitive sequence?
- 12-15 genes/Mb



**Karyotype:** the number and appearance of chromosomes in the nucleus.

---

---

---

---

---

---

---

---

---

---

### Race to Sequence the Human Genome

**articles**

## Initial sequencing and analysis of the human genome

International Human Genome Sequencing Consortium\*

### The Sequence of the Human Genome

J. Craig Venter,<sup>1\*</sup> Mark D. Adams,<sup>1</sup> Eugene W. Myers,<sup>1</sup> Peter W. Li,<sup>1</sup> Richard J. Mural,<sup>1</sup>  
 Granger G. Sutton,<sup>1</sup> Hamilton O. Smith,<sup>2</sup> Mark Yandell,<sup>1</sup> Cheryl A. Evans,<sup>1</sup> Robert A. Holt,<sup>1</sup>  
 Jeannine D. Gocayne,<sup>1</sup> Peter Amanatides,<sup>1</sup> Richard M. Ballew,<sup>1</sup> Daniel H. Huson,<sup>1</sup>  
 Jennifer Russo Wortman,<sup>1</sup> Qing Zhang,<sup>1</sup> Chinnappa D. Kodira,<sup>1</sup> Xiangqun H. Zheng,<sup>1</sup> Lin Chen,<sup>1</sup>  
 Marian Skupski,<sup>1</sup> Gangadharan Subramanian,<sup>1</sup> Paul D. Thomas,<sup>1</sup> Jinghui Zhang,<sup>1</sup>  
 George L. Gabor Miklos,<sup>2</sup> Catherine Nelson,<sup>2</sup> Samuel Broder,<sup>1</sup> Andrew G. Clark,<sup>2</sup> Joe Nadeau,<sup>2</sup>  
 Victor A. McKusick,<sup>2</sup> Nurten Zinder,<sup>2</sup> Arnold I. Lavine,<sup>2</sup> Richard I. Roberts,<sup>2</sup> Mel Simon,<sup>2</sup>

---

---

---

---

---

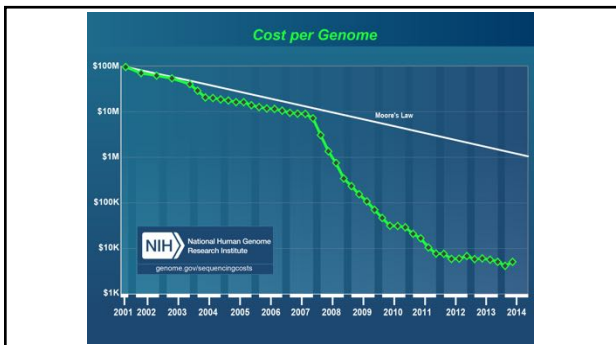
---

---

---

---

---




---

---

---

---

---

---

---

---

---

---