DNA Sequencing	
GAL AGA	
T GET LEC AA	
Ionathan Weissman	
UCSF HHMI	
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•1944 Avery and colleagues show that DNA is responsible for the transmission of heritable characteristics: DNA is the "blueprint" of life.

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•1953 Watson and Crick solve the structure of the DNA double helix providing a mechanism for copying the DNA blueprint	
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Sanger sequencing using dideoxy chain termination	
ATGC	
12 - F	
G	
C	
7 Image source Wikinedia	





Sizes of different genomes	
 Virus a few thousand base pairs (bp) up to 100 000bp 	
E. coli bacteria ~5 million bp	
Simple eukaryote (baker's yeast)	
12.5 million bp	
me) 3 billion bp	
10	000

Scaling up and automation made largescale genome projects possible





One human genome is not enough: the \$1000	0.00 aenome
challenge	
All land 1	
L Craig Venter source of the	
first individual human genome	
1 ³	Image source Wikipedia



Impact of "next-gen" sequencing	
Current cost per base ~ \$1x10 ⁻⁶ /bp	
\bigcirc Capacity throughout ~ 1 x 10 ⁹ bp/	
day vs. $\sim 1 \times 10^6$ bp/day ABI 3730xl	
Cost of resequencing the numan	
(10 000x fold cheaper than the	
original genome) and dropping	
rapidly	
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The era of personal genomic is here
Determining who will
benefit (or have
unacceptable side effects)
from a given drug
Identifying disease genes
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