

3/27/69

① Final Talk at Howard Genetic & Neural Codes.

1. ~~Info~~ Biochemistry

1. Flow of Information
2. Energy
3. Info.
 1. M.D. Binding
 2. Info processing by genetic apparatus
Neural.

2. Info retrieved from genes. Intracellular vs. external, all
Problem.

1. E. coli

3. $\sim 1.5 \times 10^6$ molecules of protein / chromosome
2. $\sim 3,000$ kinds of protein
1. ~ 400 AA / protein
4. 20 min generation time.
5. 500×10^6 AA ordered in protein

2. How is info stored & retrieved?

1. Memory resides in specific molecule
2. amt of info E. coli
Man.
3. Linear tape, 4 kinds of characters
↓ transcript

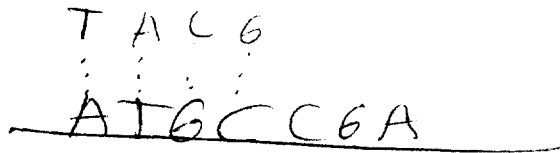
RNA
↓ Translation

3. Coding Problem
Protein Polypeptides
↓ Fold
3 dimensional Protein

E. coli

(2)

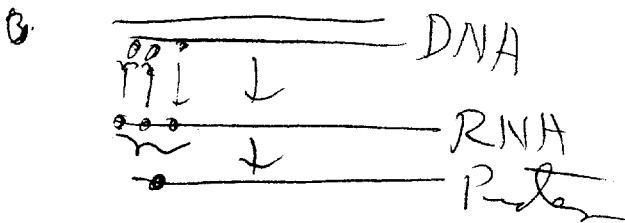
4. Template function



1. ¹ Molecule - selected
2. Relative Position
3. Relative Time

Template & Clock.

5. Turing Machine Principles



7. Few 3rd kind of units. Vary sequences
Diversity & Complexity

8. Capital investment - 75% output, E. coli
Efficiency - speed. 25% output

1. 20-30 AA/sec/min.

2. Serial or Parallel operations

1. ~~Serial~~ serial operations

2. Nouns & Verbs.

3. ~~Serial~~ sequential operations. Independent
operations

3. ~ 15,000 molecules/cell/min. Growth Rate

4. Polymers.

5. 1 message read many times.

9. Reliability

10. Accuracy

(3)

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Thoughts on info. flow Genetic vs Neural info processing for Howard University

1. ~~Thoughts on info. flow~~

1. Origin vs Evolution

A. Genetic code originated at all levels

1. ~~Genetic code~~ as 1st cell evolved

2. Oldest fossils 3×10^9 yrs. - Origin: Frequency of genes

0.6×10^9
 0.15
 0.18

} - Evolution

2. Universality - Variations in molecular recognition steps and mechanisms

3. Code fixed. Base mechanism

4. Genetic Code must have originated ~~early~~ ~~early~~

5. ~~neural code~~

B. Neural Code - Info Processing

1. Evolved after genetic code.

Pre-cellular Chemistry

1. Genetic Code \rightarrow 3000-400 $\times 10^6$ yrs.

2. ~~single cells~~ \rightarrow ~~4000-5000~~ $\times 10^6$ yrs.

3. ~~single cells~~ \rightarrow ~~4000-5000~~ $\times 10^6$ yrs.

4. ~~single cells~~ \rightarrow ~~4000-5000~~ $\times 10^6$ yrs.

2. Chemistry of cell

3. Origin of ~~neural code~~

Molecular mechanisms must have been selected from population of precursor mechanisms.

1. Mech. Enzymes - Molecular Biology

2. Molecular mech. Amplification

1. Amt. of catalyst - Hormones

2. Efficiency of catalyst

1. activate - Hormones

2. inhibit - Hormones

3. Amt. of substrate

1. building block

2. Effect - energy supply

4. Cell excitation & growth

4. ~~Reliability~~
1. Hacking's Breakdown.

10. ~~Summary~~

11. Selective expression of info.

12. ~~Learning~~ - Memory Mech.

- 1. Genetic
- 2. Immunology
- 3. Mind.

- 1) Instructive theories
- 2) Selective "

Linda Delbeck ext. SM.

B. Evolutionary Biological Cycle

Gen → Mind