

Programming of Life

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“Love the Lord your God with all your heart and with all your soul and with all your mind.” Mt. 22:37

Topics for This Presentation

Review terms related to PoL

Review cell's computers & computer programs

Computer, coding systems, & algorithmic requirements

Undirected naturalism's unanswered information questions

Evolution's acceptance problem and atheistic solutions

Information Requirements

Contingency: could be otherwise (not law determined)

A physical property isn't usually information since it has no contingency (unless constraints are controlled), e.g. -- Temperature of an object, radiation from a star, or a dark cloud with rain can be transduced into information

Chance contingency (random or biased) produced by stochastic process, e.g. -- recordation of coin flips, die rolls, non-biological amino acid chirality

Choice contingency (purposeful, meaningful, intentional) needed for all known functional information, including codes and algorithms (a challenge for science)

Bioinformatics Definitions and Implication

(4iam.org links peer-reviewed “Biocybernetics and Biosemiosis” paper)

Bioinformatics: information of life & its processing

Biocybernetics: life's hardware and software systems that use digital information processing to control, integrate, and maintain life's processes

Biosemiosis: life's independent worlds of signs and meanings connected by a code's formal conventions

Physical science (chemistry/physics): determined by law and initial constraints (no contingency except probability, e.g. radioactive decay)

Biology is an information science since it's determined by the flow of information that controls the chemistry and physics involved (it's not complex organic chemistry)

Interesting Observations

“The mechanism of heredity by gene action is insufficient to explain observations... The algorithm must be written in some abstract language... No currently existing formal language can tolerate random changes in the symbol sequences”

M. Eden "Inadequacies of Neo-Darwinian Evolution as a Scientific Theory," Mathematical Challenges to the Neo-Darwinian Interpretation of Evolution, Wistar Institute, 1966

“Each nucleus ... contains a digitally coded database larger, in information content, than all thirty volumes of the Encyclopedia Britannica”

Dawkins, *Climbing Mt Improbable*

“Biology is the study of complicated things that give the appearance of having been designed for a purpose.”

Dawkins, *The Blind Watchmaker*, p. 1

“Although they claimed to be wise, they became fools and exchanged the glory of the immortal God for images made to look like man and birds and animals and reptiles.” (Rom 1:22)

Life as Computer System? Mechanical computer designed 1837

“The machine code of the genes is uncannily computer-like. Apart from differences in jargon, the pages of a molecular biology journal might be interchanged with those of a computer engineering journal.” Dawkins *River Out of Eden*, p17

“Human DNA is like a computer program but far, far more advanced than any software we’ve ever created.” Bill Gates, *The Road Ahead*, p.228.

“Life is basically the result of an information process, a software process. Our genetic code is our software.” Craig Venter, 2010 Guardian interview.



What is A Computer?

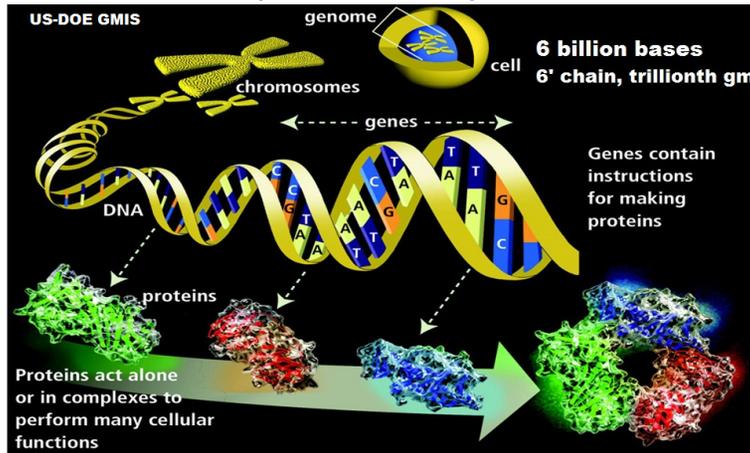
Necessary and sufficient requirements for a functional computer (mechanical, electronic, or biological) are:

- Input (or embedded data)
- Memory and internal data transfer
- An instantiated algorithm (program)
- Processing capability
- Capability to produce meaningful output

Electronic and biological computers have multiple components

- DNA/RNA can store program instructions to be executed
- Proteins can be processing and communication components
- Proteins and cellular controls are examples of output

Simplified Genetic Code for Protein Construction Life is “fearfully and wonderfully made” Ps 139:14



Simplified View of Life’s Incredible Complexity

Life is “fearfully and wonderfully made” Ps 139:14

25,000 genes (many overlapping to produce >100,000 proteins)

“A single gene can potentially code for tens of thousands of different proteins... It's the way in which genes are switched on and off, though, that has turned out to be really mind-boggling, with layer after layer of complexity emerging” Le Page, "Genome at 10," New Scientist, 6/16/10.

Genome: Digital (base 4) self-correcting encoded information

Group of 3 1-of-4 bases (ACGT): $4^3 (= 64)$ possible codons

20 amino acids for proteins redundantly codon-specified

Information in 1 teaspoon of DNA: all people + all books

Information density is 1.88×10^{21} bits/cm³

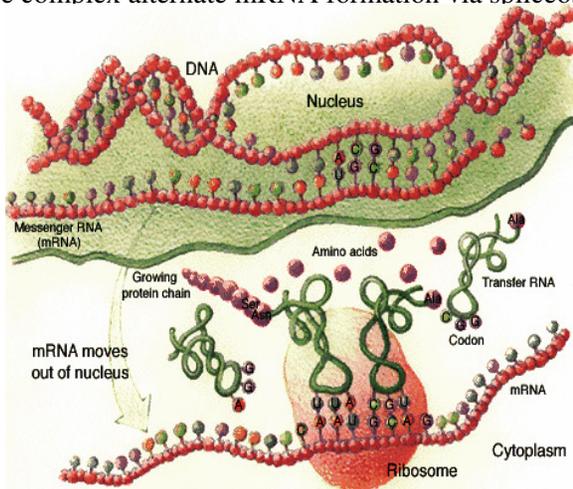
Even "simplest" organism's DNA has >150,000 nucleotides

DNA, proteins, etc. must be fully-formed/functional

>2000 enzyme proteins enable reactions

Slowest non-enzymatic reaction would take a trillion yrs

Simplified DNA Transcription/Translation Process
(more complex alternate mRNA formation via spliceosomes)



Algorithmic Prescriptive Information (PI) in Life

DNA gene sequences are real computer programs
Chance & law can't explain decision nodes (choice)

PI is intrinsically formal, but implemented physically
Abel, "The Biosemiosis of Prescriptive Information," *Semiotica*:174-1, 2009, p1-19

A nucleotide can be in multiple (e.g. 12) prescriptions

"No rational scientific basis exists for blindly believing in a relentless uphill push by mere physicality toward formal algorithmic optimization" Abel & Trevors, "Self-Organization vs Self-Ordering events in Life-Origin Models," *Physics of Life Rev*:3, 2006, p211-228.

"The Origin-of-Life Prize® ... will be awarded for proposing a highly plausible natural-process mechanism for the spontaneous rise of genetic instructions in nature sufficient to give rise to life."

Information Systems in Life

Biosemiotics: Arbitrary cybernetic sign-system
Information transfer from protein to RNA is impossible
(20 to 64 symbols exceeds Shannon channel capacity)
Life's initial alphabet was at least that of codon alphabet

In each cell, there are multiple OSs, multiple programming languages, encoding/decoding hardware and software, specialized communications systems, error detection/correction mechanisms, specialized input/output channels for cell component control and feedback, and variety of specialized "devices" to accomplish the tasks of life.

Harmful mutations limit life's existence
current 60 per newborn human -- extinction in <10ky
Fitness declines by 1-2% per generation (1995 J. Theo. Biol.
Paper title: "Why have we not died 100 times over?")
>300 generations would cause certain extinction!

Neo-Darwinian Biology: Random mutation/Selection

Richard Dawkins: "Each successive change in the gradual evolutionary process was simple enough, relative to its predecessor, to have arisen by chance... Even if the evidence did not favour it [evolution by natural selection], it would still be the best theory available!"
Blind Watchmaker, "Mutation is not an increase in true information content, rather the reverse." *Information Challenge*

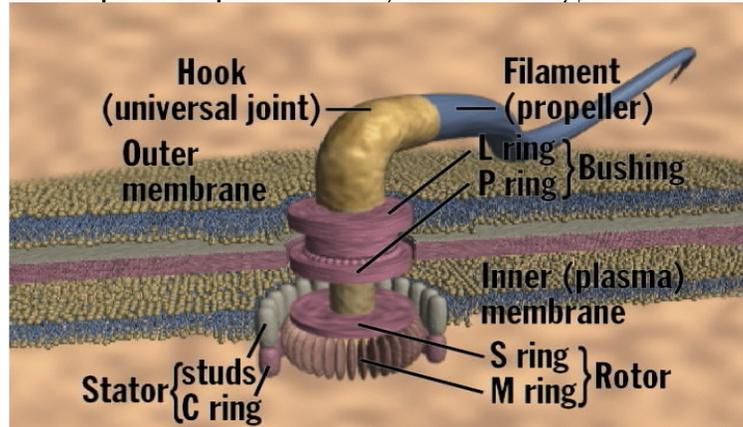
"The failure to observe even one mutation that adds information is more than just a failure to support the theory. It is evidence against the ... neo-Darwinian theory." Spetner, *Not By Chance*, p160

Randomly modifying an existing functional biological program sometimes produces a better program!? Natural selection doesn't change the genome (just favors an existing one).

Bacterial Flagellum: Irreducibly Complex

48+ proteins (>30 unique): <1 in $10^{5,250}$ probability

Each protein produced by PI of an algorithm



Life: “fearfully and wonderfully made” (Ps 139:14)

- “The complexity of biology has seemed to grow by orders of magnitude... Biology’s new glimpse at a universe of non-coding DNA has been fascinating and befuddling... the signaling information in cells is organized through networks of information rather than simple discrete pathways. It’s infinitely more complex.” E. Hayden, “Life is Complicated,” *Nature*, 4/10, p664-7
- <2% of the genome codes for protein, the rest was considered to be “Junk DNA”
- “Creationists might spend some earnest time speculating on why the Creator should bother to litter genomes with untranslated pseudogenes and junk tandem repeat DNA.” Richard Dawkins, “The Information Challenge,” 2004
- 30 papers published In Fall of 2012 shows KNOWN function of >80% of DNA (it’s NOT junk!)

Darwinism Doubted by Thousands of Scientists

“Much of the vast neo-Darwinian literature is distressingly uncritical... Natural selection has shown insidious imperialistic tendencies.” Fodor & Piattelli-Palmarini, “Survival of the fittest theory: Darwinism’s limits,” *New Scientist*, 2/3/10

“Natural selection is not a mechanism, it’s the process by which the results of evolution are sorted.” Bruce Runnegar, p188 of *The Altenberg 16: An Exposé of the Evolution Industry*, 2010 (Mazur)

“Stunningly, information has been shown not to increase in the coding regions of DNA with evolution. Mutations do not produce increased information... the amount of coding in DNA actually decreases with evolution” [Abel, “The GS (genetic selection) Principle,” *Frontiers in Bioscience*, 1/1/09, p2959-2969]

“The number of biologists calling for change in how evolution is conceptualized is growing rapidly... Yet the mere mention of the EES [extended evolutionary synthesis] often evokes an emotional, even hostile, reaction among evolutionary biologists.” Does evolutionary theory need a rethink? *Nature*, 10/8/14

Evolution via Natural Genetic Engineering

“Molecular cell biology has revealed a dense structure of information-processing networks ...The natural genetic engineering functions that mediate genome restructuring are activated by multiple stimuli...One of the traditional objections to Darwinian gradualism has been that it is too slow and indeterminate a process to account for natural adaptations, even allowing for long periods of random mutation and selection ... natural genetic engineering ... employs a **combinatorial search** process based upon DNA modules that already possess functionality ... Such a **cognitive component** is absent from conventional evolutionary theory because 19th and 20th century evolutionists were not sufficiently knowledgeable about cellular response and **control networks**.” James Shapiro, “Mobile DNA and evolution in the 21st century,” *Mobile DNA* 1/25/10 (Book: *Evolution: A View from the 21st Century*)

Science Needs to Provide Plausible Mechanisms to Explain **How did nature:**
 write the prescriptive programs needed to organize life's metabolism?
 formally solve life's other complex problems and write the programs?
 develop the operating systems and programming languages?
 develop the arbitrary protocols for communication and coordination
 among the thousands (or millions) of computers in each cell?
 develop alternative generation of prescriptive messages using
 techniques such as overlapping genes, messages within messages,
 multi-level encryption, and consolidation of dispersed messages?
 defy computer science principles by avoiding software engineering's
 top-down approach required for complex programming systems?
 produce complex functional programs without planning by randomly
 modifying existing algorithms?
 simultaneously modify multiple such programs to result in the
 production of irreducibly complex structures?
 (from "Programming of Life" -- www.programmingoflife.info)

Summary

Life has the necessary & sufficient computer requirements
 Life is incredibly complex & information rich (codes & PI)
 Each (of 100,000) protein is a real computer program output
 Scenarios proposed inadequately address information

- Assertions for origins of life & species need verification
- Other avenues may provide more fruitful paths

Darwinism is doubted by thousands of scientists
 Darwinism is a faith-based religion, at war with
 Christianity

"For our struggle is not against flesh and blood, but against the
 rulers, against the authorities, against the powers of this dark
 world and against the spiritual forces of evil in the heavenly
 realms" (Eph 6:12)

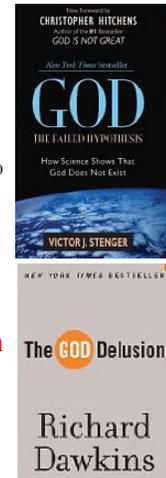
"The God who made the world and everything in it is the
 Lord of heaven and earth." Acts 17:24

(PDF of presentation available through link at www.4iam.org)

Atheistic Scientists' Religious Attacks

Sam Harris: "Letter to a Christian Nation"
 Christopher Hitchens: "God is Not Great"
 Richard Dawkins: "The God Delusion"
 Victor Stenger: "God, the Failed Hypothesis"

- "Defeating Creationism in the Courtroom,
 But Not in the Classroom," (Berkman/Plutzer, Science, 1/28/11)
 Those "who cannot accept evolution as a
matter of faith to pursue other careers...
 [Their plan] would reduce the supply of
 teachers who are especially attractive to the
 most conservative school districts."
- "Science, Religion, and Society: **the Problem
 of Evolution in America**" (J Coyne, Evolution, pages 2654-2663, 8/2012)
 "America's resistance to evolution is truly a
 byproduct of America's extreme [theistic]
 religiosity"



Useful ID References

Probability's Nature and Nature's Probability, Don
 Johnson (2 versions: 2009 Lite/2010 revised Scientists')
 Programming of Life, Don Johnson, 10/10&5/15, Video 8/11&7/15
 The Privileged Planet, Gonzalez & Richards, 2004
 Darwin's Black Box, Michael Behe, 1996
 Signature in the Cell, Stephen Meyer, 2009
 Darwin's Doubt, Stephen Meyer, 2013
 Uncommon Dissent, William Dembski, 2004
arn.org, intelligentdesign.org, uncommondescent.com,
scienceintegrity.org (PDFs available at www.4iam.org)

Creation/Biblically-based References

answersingenesis.org, creation.com, icr.org, reasons.org
 The Case for A Creator, Lee Strobel, 2006
 I Don't Have Enough Faith to Be an Atheist, Geisler, 2004