The complexity of a living cell.

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- According to most science text books the first life appeared on Earth at least 2.5 billion years ago.
- That is they claim that life started from non-living chemicals.
- This is called "Chemical Evolution"

- However most text books do not explain how this could happen!

- Every living organism on earth is constructed by molecular machinery which can read an instruction manual written in a special language. This language consists of four specific tiny molecular structures which are the “letters” of the language.
- Every different living organism has a different instruction manual – called DNA.

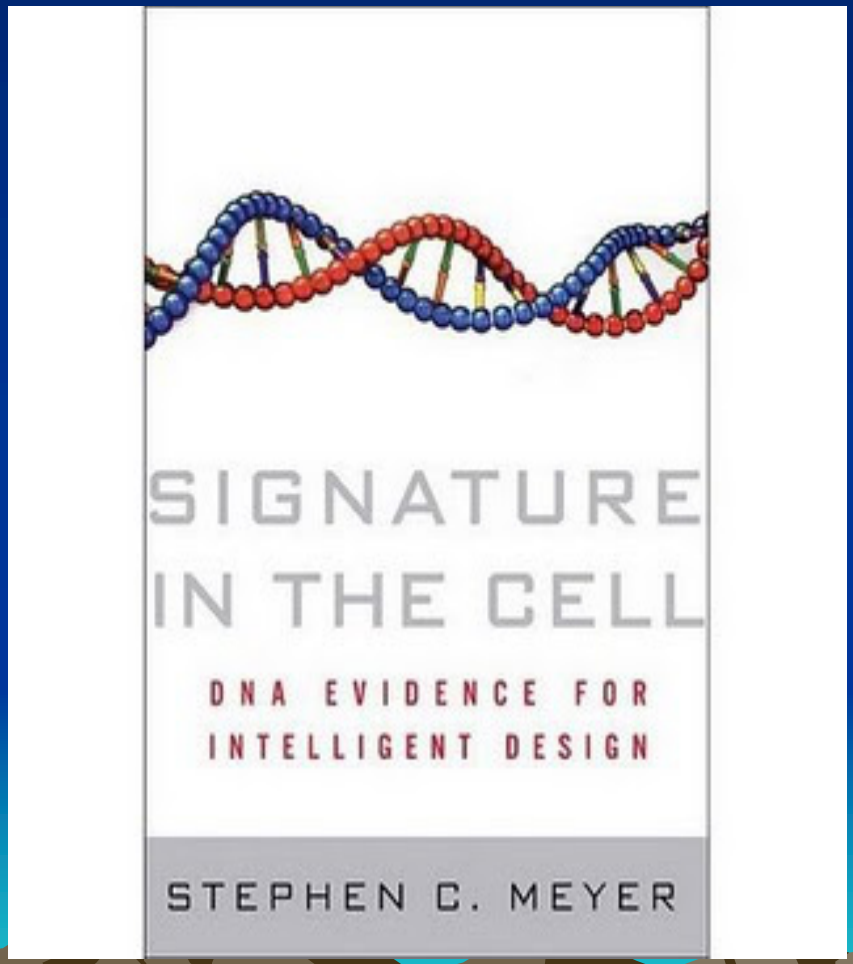
- **The Theory of Evolution requires** :

- The molecular machines to form by chance chemical reactions.
- The DNA language to form by chance.
- The instruction manual (DNA) for the construction of each different organism to form by chance chemical reactions.
- A non living molecular structure to be somehow made alive.

- An attempt to explain how life could form from chemicals was proposed in 1969 by Dean H. Kenyon Professor of Biology at San Francisco State University.
- However he came to realise that the DNA code and code reading system for life is too complex to arise by chance chemical reactions.
- He now believes life must have been created by God.

- Google: Dean Kenyon Darwin
- And go to “The Charles Darwin of our Time” youTube 9.56 min
- or
- http://www.youtube.com/watch?v=y_VYPy_BW68

- Dr S.C. Meyer PhD
- (Cambridge)



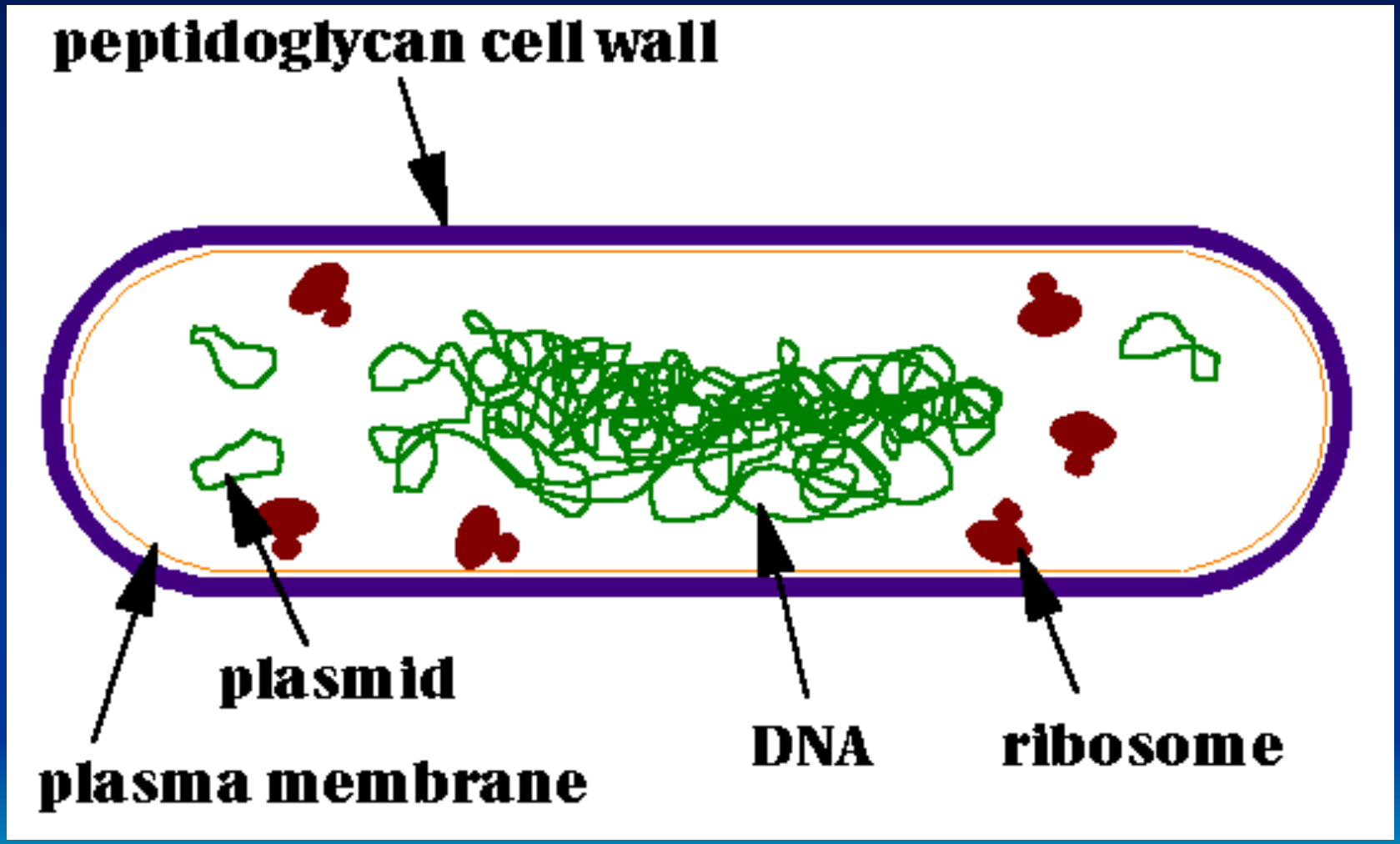
- So why do these leading scientists reject chemical evolution as the origin of life?
- Because biochemically it is **IMPOSSIBLE** for a living cell to arise by chance chemical reactions.

- Living cells are amazingly complex self reproducing chemical factories.

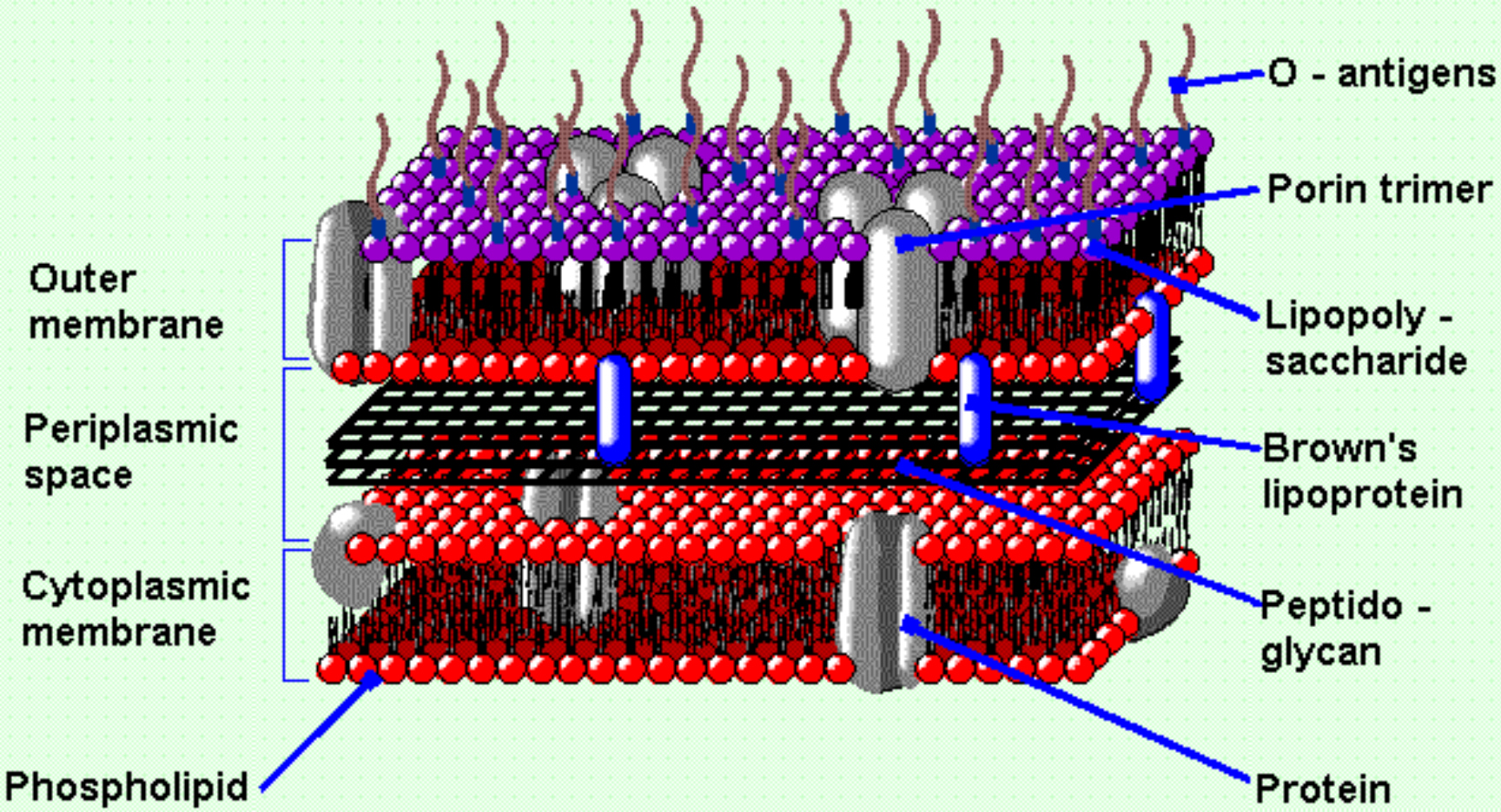
Requirements for a simple cell to form

- Biopolymers have to form
- DNA coding information has to form
- Code reading & protein production mechanisms have to form
- Hundreds of chemical reactions have to be put out of balance by just the right amount – all at the same time to start the life process.

- Examples of the types of huge long chain-like biopolymer molecules that have to form – not just one but millions of molecules have to form to make enough material for the components of just one cell - include :
- proteins,
- polysaccharide (long chains of sugar type molecules).
- Lipid (or fat) molecules.


peptidoglycan cell wall
plasmid
plasma membrane
DNA
ribosome

The Gram - negative Envelope



- For example the smallest known cell, *Mycoplasma genitalium** contains millions of individual molecules, consisting of hundreds of different types of chemicals, arranged according to specific functions, and which take part in hundreds of different simultaneous chemical reactions, to give life to the cell. The DNA code contains 580,000 pieces of code arranged as 471 genes.

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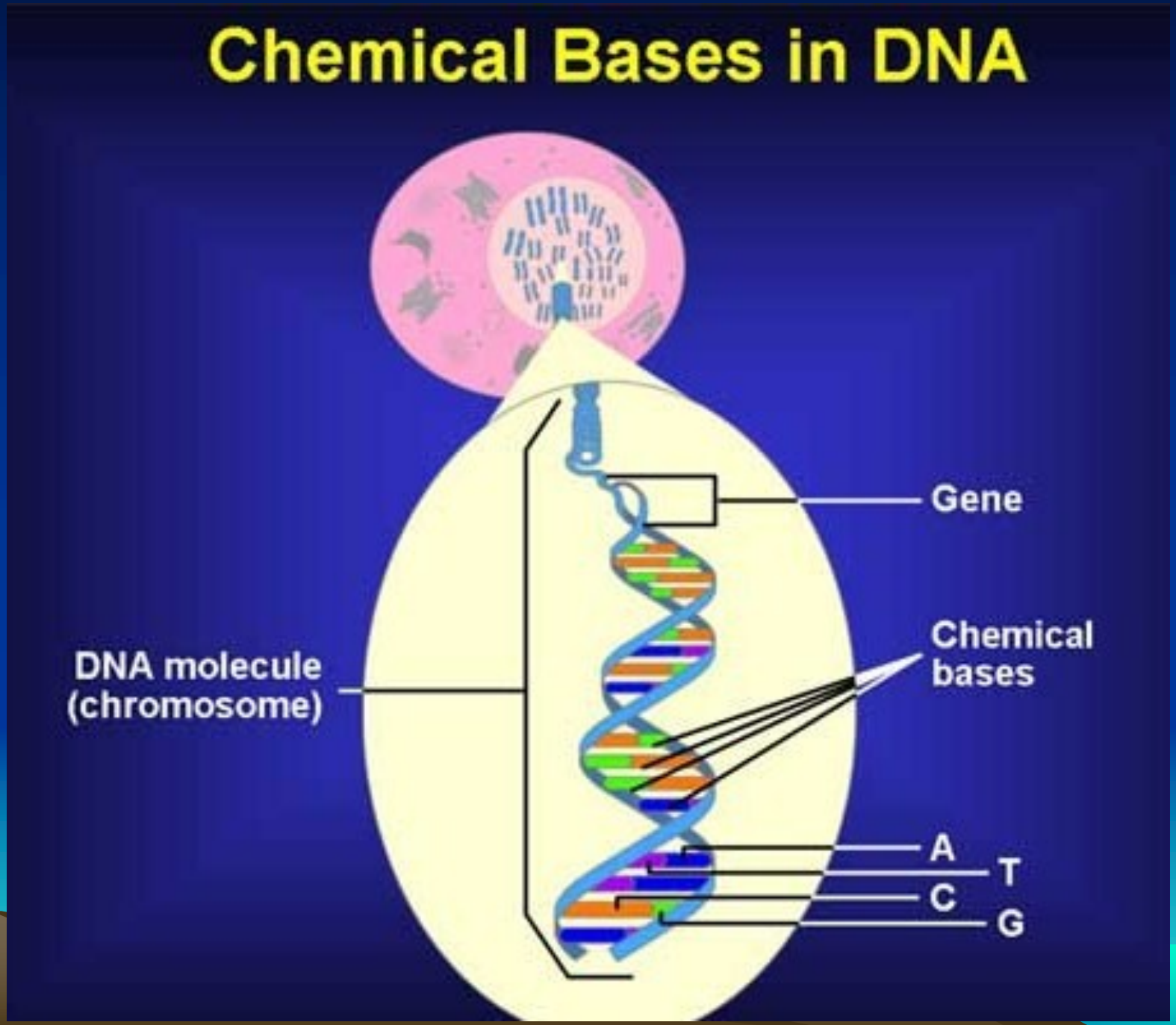
- A probability of less than 1 in 10 with 150 zeros is regarded as **impossible**.

- The probability of one small gene forming by chance is less than 1 in 10 with190 zeros
- And this is just for 1 gene let alone the extra 471 genes required for the simplest life.

Chemical Bases in DNA



ماهی
دوزیستان
خزندگان

Zivis

Abinieku

Rāpulis

Codes

fish

amphibian

reptile

The ribosome is a code reader machine that reads the DNA code and uses the information to construct new molecules which make up the molecular components of living cells.

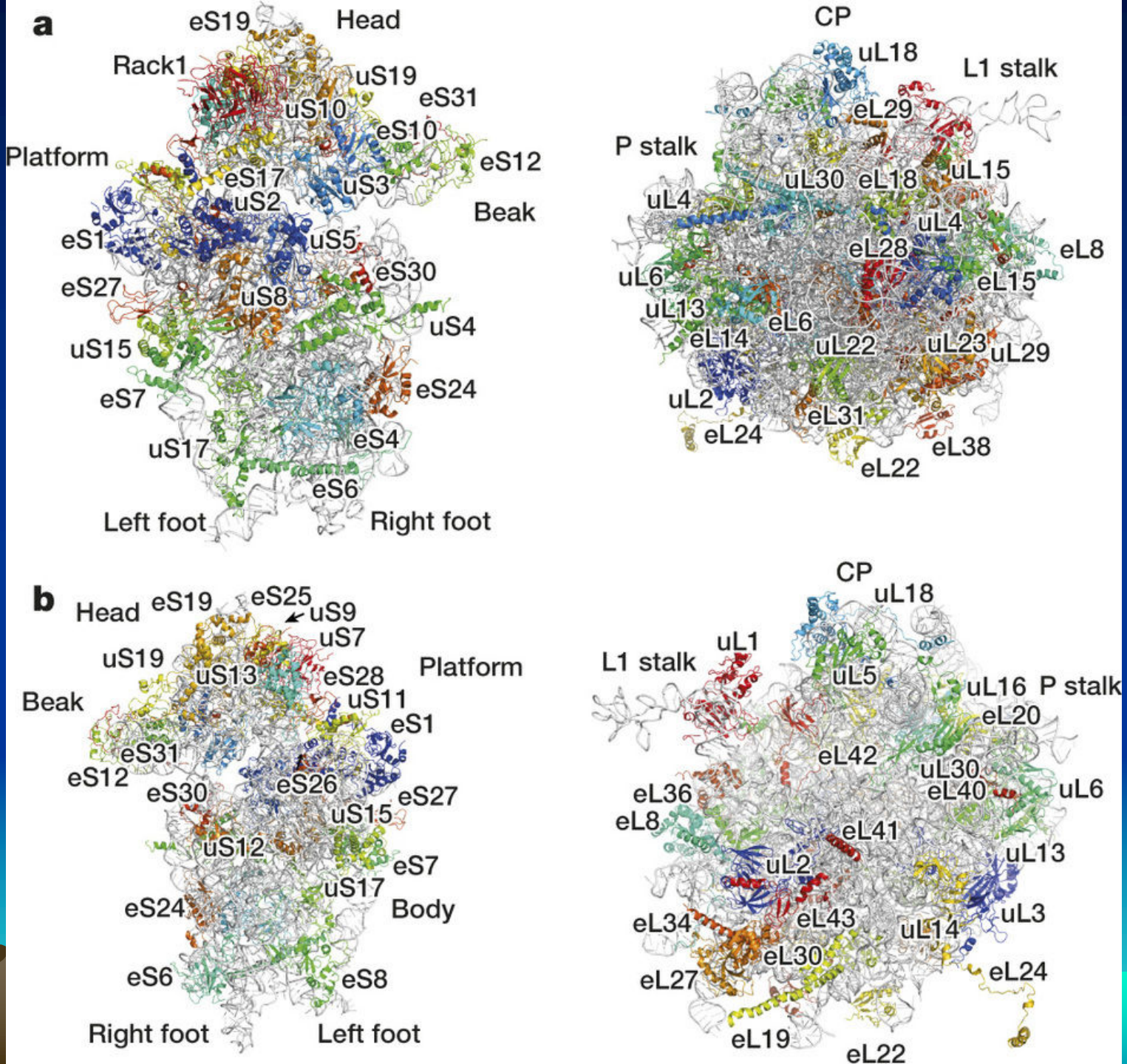
The Chemists that worked out the molecular structure of a ribosome received the Nobel Prize for Chemistry in 2009. This structure contains hundreds of thousands of atoms.

Evolutionists have to believe this code reader machine arose by chance. **Without it DNA is useless**!

This year's Nobel Prize in Chemistry awards **Venkatraman Ramakrishnan**, **Thomas A. Steitz** and **Ada E. Yonath** for having showed what the ribosome looks like and how it functions at the atomic level.

All three have used a method called X-ray crystallography to map **the position for each and every one of the hundreds of thousands of atoms that make up the ribosome.**

Inside every cell in all organisms, there are DNA molecules. They contain the blueprints for how a human being, a plant or a bacterium, looks and functions.
But the DNA molecule is passive. If there was nothing else, there would be no life.
The blueprints become transformed into living matter through the work of ribosomes.


a
eS19
Head
Rack1
uS19
eS31
uS10
eS10
Platform
eS12
eS17
uS3
uS2
Beak
eS1
uS5
eS30
eS27
uS8
uS4
uS15
eS24
eS7
eS4
uS17
eS6
Left foot
Right foot
CP
uL18
L1 stalk
eL29
P stalk
uL30
eL18
uL15
uL4
uL4
eL28
eL8
uL6
eL15
uL13
eL6
eL14
uL22
uL23
uL29
uL2
eL31
eL24
eL38
eL22
b
Head
eS19
eS25
uS9
uS7
uS19
uS13
eS28
Platform
Beak
uS11
eS1
eS31
eS12
eS30
eS26
eS27
uS15
uS12
eS7
uS17
eS24
Body
eS6
eS8
Right foot
Left foot
CP
uL18
uL1
L1 stalk
uL5
uL16
P stalk
eL20
eL42
uL30
eL40
uL6
eL36
eL8
eL41
uL13
uL2
eL34
eL43
uL14
uL3
eL30
eL27
eL24
eL19
eL22

- A single living *E. coli* contains around 2.4 million protein molecules made up of approximately 4,000 different types of proteins.
- Along with these proteins the cell contains around 255,000 nucleic acid molecules made up of 660 different types of nucleic acids.

- Along with these nucleic acids are around 1.4 million polysaccharide (long chains of sugar type molecules) molecules made up of three different types of polysaccharides.

- Along with these polysaccharides are around 22 million lipid molecules made up of 50 to 100 different types of lipids.
- Along with the lipids are many millions of metabolic intermediate molecules made up of about **800 different types of compounds** which have to be at just the right concentration otherwise the cell will die.

- For example, the DNA of *E coli* contains 4,288 genes each containing about 1000 pieces of code. The functions of some of these genes have been identified as follows:-

Function involved	**Number of genes**
Amino acid metabolism	131
Biosynthesis of cofactors etc	103
Cell envelope	195
Cellular processes	188
Central intermediary metabolism	188

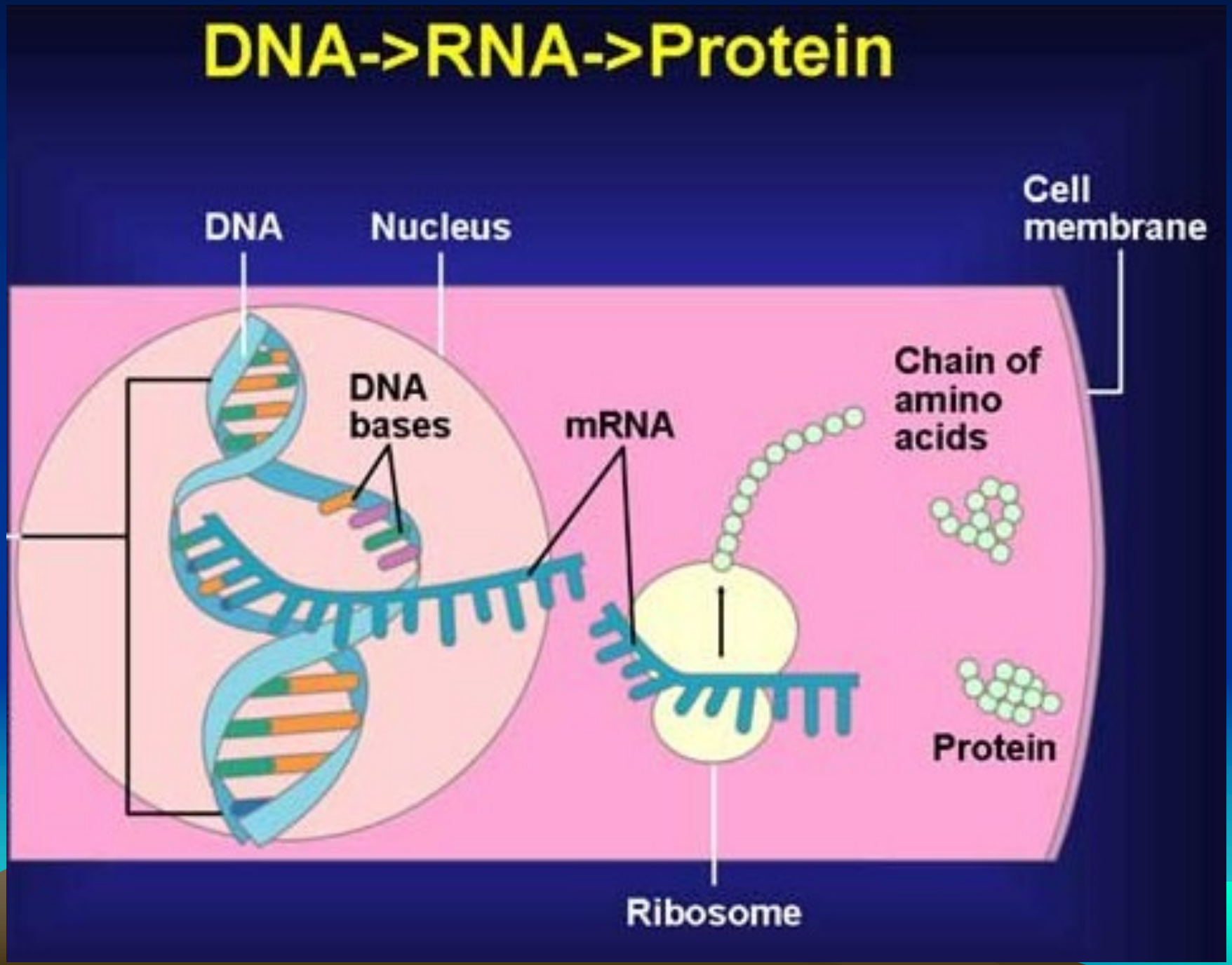
Function involved	Number of genes
Energy metabolism	243
Fatty acid and lipid metabolism	48
Nucleotides and related molecules	58
Regulatory functions	45
Replication	115
Transcription	55
Translation	182

- Only the function of 1,551 genes out of the total 4,288 genes in a simple cell are accounted for here. The reason being that at the time of publication of the genome sequence, the function of the remaining 2,737 genes had not been identified. Chemical evolution requires this complex information system to arise by chance!

Reading the DNA code and replicating the cell components

- The DNA code reading mechanism is truly amazing and involves complex molecules which unwrap and copy the DNA code – and transport the copy to a protein making factory. The complex molecules involved could not form by chance.

- DNA replication youtube video
- Google DNA replication WEHI
- Or
- http://www.youtube.com/watch?v=4PKjF7OumYo


DNA->RNA->Protein
DNA
Nucleus
Cell membrane
DNA bases
mRNA
Chain of amino acids
Protein
Ribosome

- For such a complex structure of molecular polymers and chemicals all at the right concentrations and with just the right base code to co-ordinate function, to form by chance has been shown to be absolutely impossible by Dr S.C. Meyer and many other scientists. For details see: http://www.discovery.org/a/2184

- For life to start from non living molecules we would need:

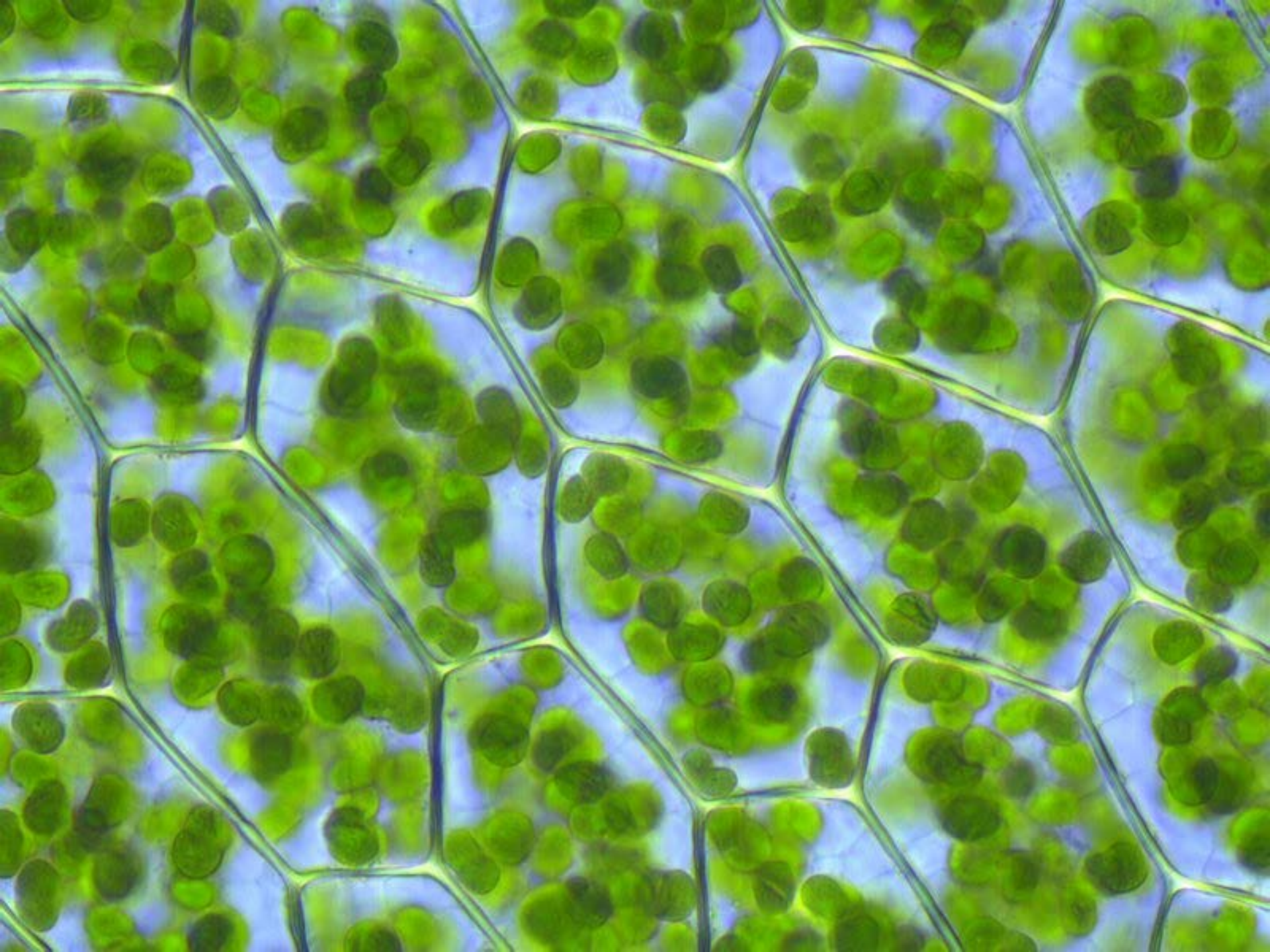
1. formation of bio-monomers
2. formation of biopolymers including DNA
3. formation of connected metabolic pathways
4. formation of a live cell, where the chemical reactions are in a steady state of non-equilibrium.

Step one has been achieved in the laboratory by scientists but not in nature.

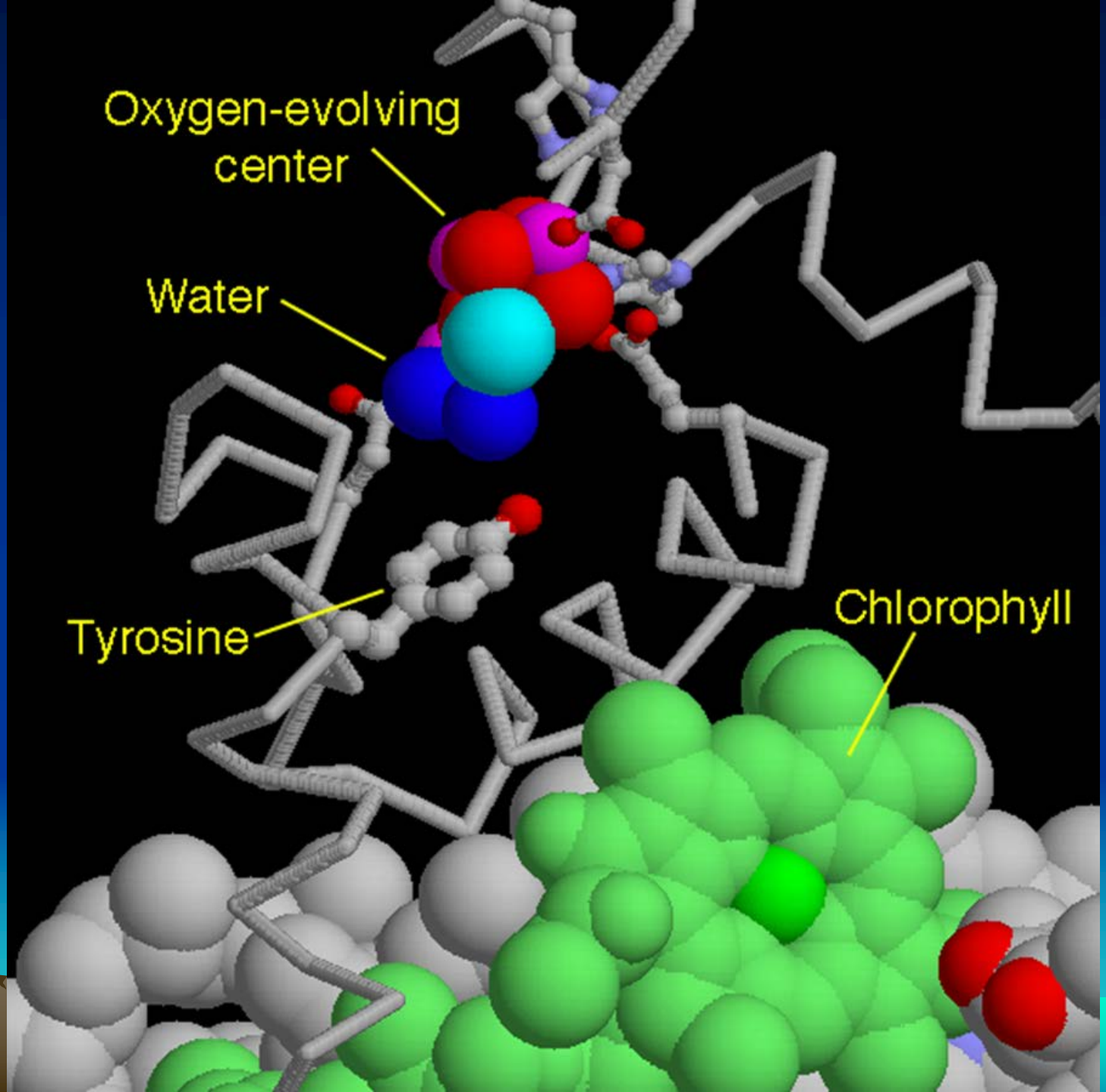
To this day it has not been possible to perform step two in the laboratory despite the best efforts of intelligent scientists.

On the basis of our current knowledge, steps three and four are impossible to make happen even in a laboratory.

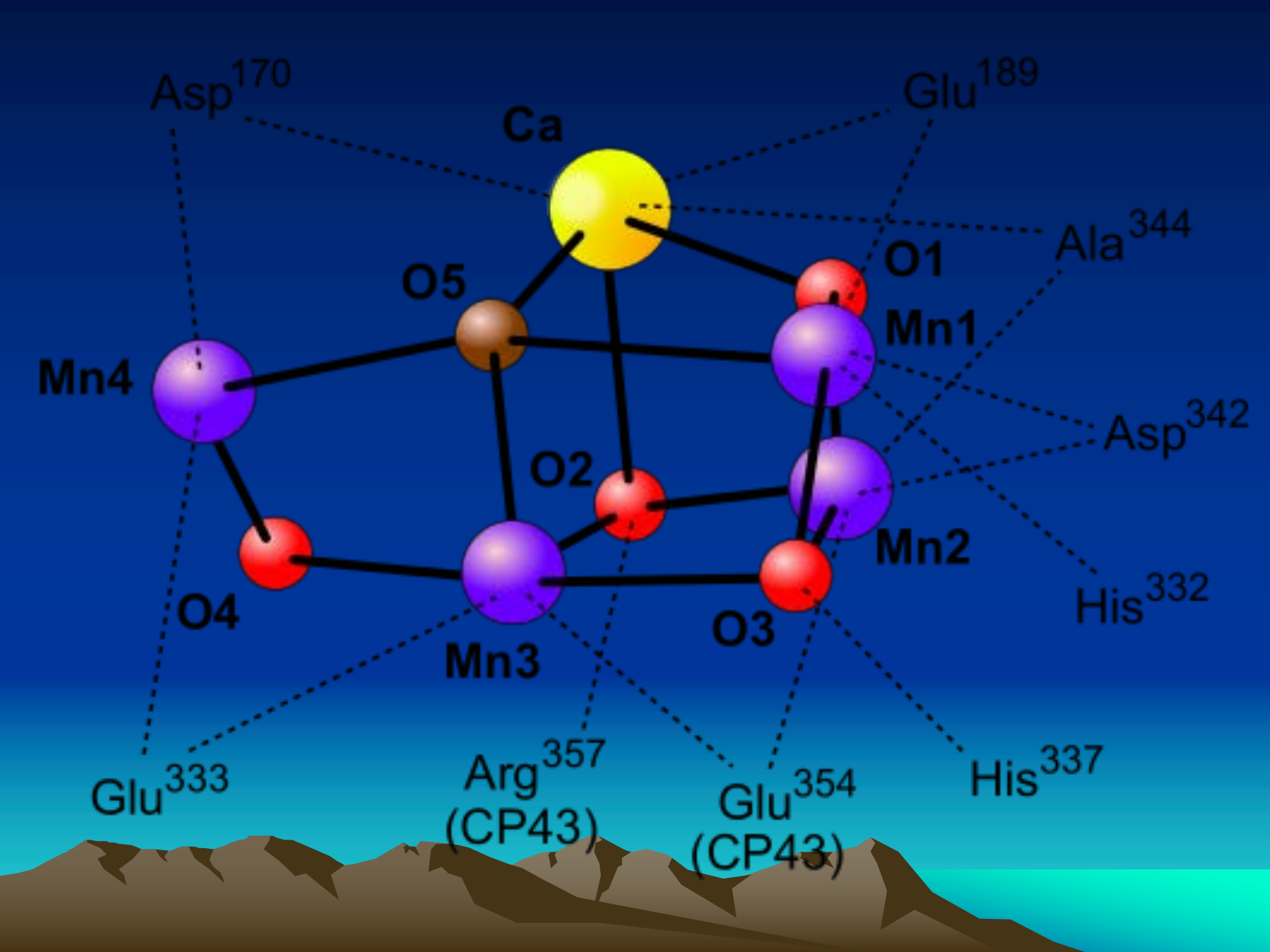
A living cell cannot form by chance !!!



- Photosystem II (the story from a Rutgers/ UC San Diego – biology & medicine teaching site)
- “Three billion years ago, our world changed completely. Before then, life on Earth relied on the limited natural resources found in the local environment, such as the organic molecules made by lightning, hot springs, and other geochemical sources. Everything changed when cyanobacteria discovered a way to capture light and use it to power their internal processes. With this new discovery, cells could take carbon dioxide out of the air and combine it with water to create the raw materials and energy needed for growth.”


Oxygen-evolving center
Water
Tyrosine
Chlorophyll

- The oxygen-evolving center of photosystem II is a complicated cluster of manganese ions (magenta), calcium (blue green) and oxygen atoms (red). It grips two water molecules and removes four electrons, forming oxygen gas and four hydrogen ions.
- The actual binding site of the two water molecules is not known for certain. The tyrosine shown in the middle forms a perfect bridge between the water site and the light-capturing chlorophyll. (the green pigment in plants).


Asp170
Glu189
Ca
Ala344
O1
O5
Mn1
Mn4
Asp342
O2
Mn2
O4
His332
O3
Mn3
Glu333
Arg357
(CP43)
Glu354
(CP43)
His337

- For me , the molecular complexity of living cells is compelling evidence for a supernatural creator God.