(A) What is the probability that a single protein formed when 100 amino acid randomly joined together?

1. There are 20 different amino acids that make up the proteins in living things. (Remember, these had to form by chance in the first place).

2. ∴ there are 20^{100} different proteins that can be made from 100 amino acids

3. This is ≈ 10^{130} different proteins

4. ∴ the probability that a 100 amino acid protein will form by chance
= 1 in 10^{130}

5. This means (according to probability) that to form one specific 100 amino acid protein, 10^{130} will need to form randomly before the right one forms.

(B) Evolution proposes that many of these proteins came together by chance and then evolved into cells.

1. But, for a cell to form in the primordial soup:-
(i) The many proteins that make it all had to form by chance, &
(ii) Each protein had to form by chance right next to each other

2. The probability that numerous things will occur by chance is the multiple of each occurring.

3. ∴ the chance that 2 different (but correct) proteins form by chance = the chance of each forming multiplied together.

4. This = $10^{130} \times 10^{130} = 10^{260}$

5. So, as a cell is made up of many proteins, it isn't hard to see that the chances are impossible.

viz — $10^{130} \times 10^{130} \times 10^{130} \times 10^{130} \times 10^{130} \times 10^{130} \times 10^{130} \times 10^{130}$ .....

This is an unimaginable number. It is now easy to see why Sir Fred Hoyle doesn't believe that life evolved on Earth:-

"[T]here are about two thousand enzymes, and the chance of obtaining them all in a random trial is only one part in $(10^{20})^{2000} = 10^{40,000}$, an outrageously small probability that could not be faced even if the whole universe consisted of organic soup."

F. Hoyle & C. Wickramasinghe (1981), "Evolution From Space", J.M. Dent & Sons: London p:24

(C) How big is a pile of 10^{130} protein molecules – a bucket full??

1. What would be the size of the 10^{130} rubbish proteins that would need to form by chance to create just 1 (one) specific protein of 100 amino acid?

2. If we average out the weight of the 20 amino acids to 100 Daltons each, then...

a protein made of 100 amino acids would weigh 100x100 Daltons on average

3. This = 10^4 Daltons

4. $\therefore 10^{130}$ proteins would weigh 10^{130} x 10^4 Daltons

5. This = 10^{134} Daltons

6. To turn Daltons weight into grams weight, divide by Avogadro's number – 10^{24}

7. $\therefore 10^{134}$ Daltons = $10^{134} \div 10^{24} = 10^{110}$ gm

8. 10^{110} gm in kilograms = $10^{110} \div 10^{3} = 10^{107}$ kg

9. Let's assume that the density of the proteins is the same as water (ie 1 gm/cm^3)

10. So, as there are 1000 gms in a kilogram, then 1 gm/$cm^3 \equiv 10^{-3}$ kg/cm^3

11. $\therefore 10^{107}$ kg occupies a volume of $10^{107} \times 10^{-3}$ $cm^3 = 10^{104}$ cm^3

12. Now, 1 $km^3 = 10^5 \times 10^5 \times 10^5$ $cm^3 = 10^{15}$ cm^3

13. $\therefore$ the volume of these 10^{130} proteins = $10^{104} \div 10^{15}$ $km^3 = 10^{99}$ km^3

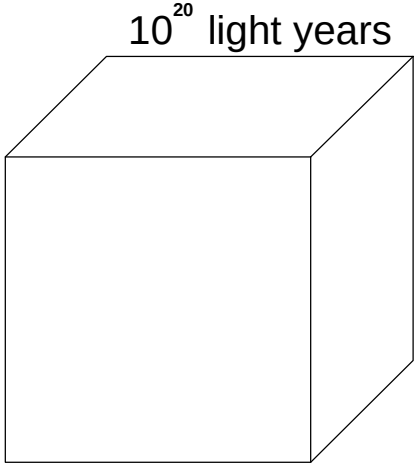
14. If these proteins formed a solid cube, each side would measure $\sqrt[3]{10^{99}}$ kilometres

15. This = 10^{33} km

16. How long is 10^{33} km?

If 1 light year = 10^{13} km, then 10^{33} km = $10^{33} \div 10^{13} = 10^{20}$ light years

This means that 10^{130} proteins would form a cube with 10^{20} light year sides



AND THIS IS TO FORM JUST ONE TINY PROTEIN MOLECULE

Imagine how much rubbish protein would need to form by chance over millions of years before the right ones formed (next to each other), — before evolving into the first cell?

***SOURCE*: Professor F. de Angelis, "The Origin of Life by Evolution: an obstacle to the development of science" (English translation), F. de Angelis: Camucia (Italy) 1995 p:104-105**