

Three variants of genetic code

The notions of MB and view about dark matter leads to 3 **variants of genetic code**.

1. The notion of MB suggests that dark proton sequences assumed to explain **Pollack effect** (<http://tinyurl.com/gwasd8o>) realize dark genetic code. DDNA codon would correspond to **3-proton triplet** assignable to closed flux tubes attached to a long flux tube by U-shaped flux tube appendix giving rise to **dark gene** (<http://tinyurl.com/jgfjlbe>). 3-proton states define **dark analogs** of DNA, RNA, tRNA, and amino-acids (**DDNA, DRNA, DtRNA, DAA**). The numbers of **DDNAs coding for given DAA** are same as for **vertebrate genetic code**.
2. Second dark code is needed for communications and realizes genetic codons as **dark 3-photon states - 3-chords of bio-harmony** (<http://tinyurl.com/yad4tqwl>). The model emerged from a model of musical harmony based on **icosahedron and tetrahedron. 12-note scale** is identified as a **Hamiltonian cycle** - a path going through **all 12 vertices** of icosahedron - such that going from vertex to neighbor corresponds to quint. Hamiltonian cycles have cyclic group Z_n , where $n = 0, 2, 4, 6$ is the order of the group, as symmetries. $n = 0$ corresponds to chaotic orbit and disharmony. Each of the 20 faces - triangles - corresponds to a chord of given harmony.

One identifies the **orbit of given face as DAA** coded by faces (DDNAs) at the orbit. By combining 3 harmonies with $n = 6$, $n = 4$ and $n = 2$ one obtains 20+20+20 chords and the numbers of DNA coding given AA are essentially those in vertebrate code. By gluing tetrahedron to one face one obtains 4 additional chords (DDNAs) and 1 additional note very near to one of the notes of Pythagorean scale, whose problem is that it does not quite close. The numbers for analogs of DNA codons coding for for given DAA are same as for vertebrate code.

The chords would be represented as “**music of light**” as states of 3 dark photons. Music expresses and creates emotions and bio-harmony would provide a physical correlate for **emotional states at molecular level**.

3. Dark codes would be fundamental and chemical code would be their mimicry. One expects **DDNA-DNA pairing** with DDNA codons represented as dark proton triplets. DDNA codons and dark photon chords have **no decomposition to letters** (chinese and western languages provide an analog). This suggests that **DNA replication and transcription cannot take letter-wise but but codon-wise**.

Nucleotides/letters in the water environment of DNA double strand should appear as loosely bound but correlated triplets of nucleotides associated with closed flux tubes containing dark DNA codon. They would represent **exotic DNA codons**. This would force fixed order of nucleotides essential for the code. By absence of valence bonds between nucleotides they would be effectively free but strongly correlated. This representation of the code would be crucial for replication and transcription.

These 3 codes allow to understand replication and transcription of DNA replaced in TGD with DDNA-DNA pair. The prediction is that the replication takes place codon by codon.

A model of replication based on this picture generalizes to **remote replication** (Montagnier et al). The DDNA codons of ordinary DNA strand would be attached with a long side of closed flux tube as **dark gene**. In remote replication h_{eff} of dark gene would change and

dark gene would be transferred to chamber B from A. Replication would proceed as usual after that.