New results about dark DNA inspired by the model for remote DNA replication

M. Pitkänen
Email: matpitka6@gmail.com.
`http://tgdtheory.com/`.

February 21, 2020

Abstract

Two objections against TGD based view about DNA and genes are discussed.

TGD predicts two dark variants of genetic code realized as dark codons (DDNAs) identified either as dark proton triplets or dark photon 3-chords. The objection against dark photon 3-chords (3-photon states) is that the simultaneous emission of 3 dark photons is extremely non-probable. The proposed solution of the problem is that dark photons carry number theoretic color associated with Z_3 sub-group of Galois group. Number theoretic color confinement would imply that only 3-chords can appear as asymptotic states analogous to baryons as 3-quark states. If also the dark protons form number-theoretic color triplet, dark codons must consists of 3 protons and therefore also ordinary codons would have 3 letters.

The findings of Gariaev's group and Montagnier et al suggest the possibility or remote replication of DNA. The fact that dark codons do not decompose into letters like chemical codons poses strong constraints on the replication and transcription if one assumes DDNA-DNA-pairing. These constraints strongly suggests that the nucleotides in the water environment of DNA are not actually free but form loosely bound triplets representing codons bound with DDNAs. Replication is predicted to occur in codon-wise manner: this has been observed to be possible for RNA. It might be that the loose nature of exotic DNA codons allows this to occur quite generally.

Remote replication in this framework reduces to ordinary replication in TGD sense if also dark genes are present and formed by attaching flux tubes characterizing dark codons to a long flux tube associated with gene. Remote replication requires that the portion of dark gene accompanying ordinary gene is transferred from chamber A to chamber B in the experiment of Montagnier.

1 Introduction

In TGD inspired vision about quantum biology relying on the notion of magnetic body (MB) carrying dark matter as phases of ordinary matter with effective Planck constant $h_{eff} = n \times h_0$ one ends up with the notion of dark DNA realized as sequences of dark protons and to the surprising finding that dark proton triplets realize vertebrate genetic code and basic biomolecules DNA,RNA,tRNA, and amino-acids [L4, L6].

The objection against dark photon 3-chords (3-photon states) is that the simultaneous emission of 3 dark photons used in communications as 6-bit unit is extremely non-probable. A possible solution of the problem is that dark photons carry number theoretic color associated with Z_3 sub-group of Galois group. Number theoretic color confinement would imply that only 3-chords can appear as asymptotic states analogous to baryons. If dark protons are also number theoretic color triplet, dark codons must consists of 3 protons and therefore also ordinary codons have 3 letters.

The findings of Montagnier et al [I1] (`http://arxiv.org/abs/1012.5166`) raise the possibility of remote replication of DNA. Montangier's experiment involves two chambers A and B. A contained water and genes and B water and DNA nucleotides. There were channels between the chambers but so thin that DNA could not get through. Besides this there was present em field with 7 Hz frequency. Same genes as in A appeared also in B. As if remote replication of genes in A had happened in B. I have written an articles about Montagnier's findings [L11, L2]. Gariaev

has reported similar phenomenon already before Montagnier et al: we wrote together an article discussing TGD based model for the finding [L12].

How did the genetic information pass to B and how the remote replication took place? Somehow the radiation made the remote metabolism possible or at least more probable. Clearly the information about gene - not only about codons but also about their order and relative positions - should have been communicated from A to B. I have already earlier considered this problem but found no satisfactory solution to it.

Concerning the role of the 7 Hz frequency, there are two hints.

1. The nominal value of the lowest Schumann frequency is 7.8 Hz, not far from 7 Hz. Could one think that macroscopic quantum coherence in the scale of Earth was involved. 7.8 Hz correspond to wavelength equal to circumference of Earth.

   "Endogenous" magnetic field $B_end = .2$ Gauss identifiable as the monopole flux part of the Earth's magnetic field $B_E = .5$ Gauss explains the findings of Blackman [J1] and others about quantal looking effects of radiation at frequencies seem to be multiples of cyclotron frequencies of biologically important ions.

   The problem is that the energies of cyclotron photons are ridiculously small for ordinary value of Planck constant. This was one of the motivations for the hypothesis that dark matter corresponds to phases of ordinary matter with effective Planck constant $h_{eff} = n \times h_0$ [K4, K2, K3]. The cyclotron frequency of K ion is $f_c(K^+) = 7.1$ Hz. The flux tubes with length of corresponding cyclotron frequency are also of the order of Earth circumference.

This raises several questions.

1. Did water generate flux tubes with magnetic field with frequency equal to $f_c(K^+) = 7.1$ Hz and strengthening coupling to a radiation with Schumann frequency or K cyclotron frequency or both so that the communications with the MB of Earth or/and layer of MB corresponding to K cyclotron was strengthened? The TGD based mechanism of water memory [K1] would be involved.

2. Did this make the remote replication more probable? How?

3. What DNA actually looks like in TGD Universe? What actually happens in DNA replication? What could happen in remote DNA replication?

In the sequel the questions whether cyclotron frequency or Schumann frequency or both were involved and how their presence made possible remote replication remain without detailed answer although it is clear that the presence of dark photons with this frequency should make possible the control by MB generating coherence of ordinary matter in the scale determined by the sizes of the chambers. These questions however led to a considerable increase in the understanding of dark variants of genetic code predicted by TGD [L4, L1, L9].

1. To understand remote replication one must understand replication. Dark codons do not decompose into letters like chemical codons: this poses strong constraints on the replication and transcription if one assumes DDNA-DNA-pairing. These constraints strongly suggests that the nucleotides in the water environment of DNA are not actually free but form loosely bound triplets representing codons and bound with DDNAs. This means a new variant of genetic code realizing codons as loose triplets of nucleotides in the water environment.

2. This proposal brings in mind TGD based model for viruses, which can decompose into pieces shared between several host cells and re-combine later as also the observation that the dense states of bacteria population have resemblance to multi-cellular embryos. The common TGD inspired explanation [L10] would be that the pieces of virus and cells of bacterial population are connected by magnetic flux tubes and form a single loosely bound unit at the level of MB. The prediction is that replication occurs in codon-wise manner: this has been observed to be possible for RNA [L13]. It might be that the loose nature of exotic DNA codons allows this to occur quite generally.

3. Remote replication in this framework reduces to ordinary replication in TGD sense if also dark genes are formed by attaching flux tubes characterizing dark codons to a long flux tube associated with gene. Remote replication requires that the portion of dark gene accompanying ordinary gene is transferred from chamber A to chamber B in the experiment of Montagnier.

1.1   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) [L3] realize dark genetic code. Dark DNA (DDNA) codon would correspond to 3-proton triplet assignable to closed flux tubes attached to a a long flux tube by U-shaped flux tube appendix giving rise to dark gene (http://tinyurl.com/jgfjlbe). Attaching means formation of U-shaped appendices from long flux tube and DDNA codon which reconnect to a pair of flux tubes. 3-proton states define dark analogs of DNA, RNA, tRNA, and amino-acids (DDNA, DRNA, DtRNA, DAA) [L4, L6]. 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 [L1, L8, L9] (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 [L7].

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 letterwise but but codon-wise. Amazingly, there is evidence that DNA replicates in codon-wise manner during RNA era: I have commented this in [L13].

   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 and might kill the model.

A model of replication based on this picture generalizes to remote replication suggested by the findings of Montagnier [I1]. 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. After that the replication would proceed as usual.

1.2   An objection against bio-harmony

There is a serious objection against the realization of dark genetic code in terms of bio-harmony. The emission of 3 dark photons simultaneously looks extremely non-probable process.

Number theoretical physics suggests a solution of the problem. Number theoretical physics [L5] (http://tinyurl.com/zylrd7w) is a central part of quantum TGD and quantum biology and provides physical correlates for cognition. It explains dark matter as $h_{eff} = nh_0$ phases of ordinary matter with n identified as order of Galois group of extension of rationals and as dimension of extension. This picture predicts automatically evolution as increase of n in quantum jumps.

1. There is analogy with color confinement. Baryons consist of 3 quarks. Color symmetry is a symmetry of strong interactions and quarks form color triplets. Free quarks do not appear in the final states, which givs rise to color confinement: only color singlets, in particular baryons consisting of 3 quarks and mesons consisting of quark and antiquark are possible.

   This suggests that also now there must be a symmetry such that dark photons have new quantum numbers, which vanish for physical states such as dark photon triplets.

2. What these quantum numbers could be? The only candidate, which comes in mind are discrete quantum numbers related to the Galois group of extension of rationals defining number theoretic symmetry. For ordinary $h = 6h_0$ Galois group has $n = 6$ elements and equals to $Z_6 = Z_2 \times Z_3$.

   It appears as subgroup of higher Galois groups for which $h_{eff} = n \times h = 6nh_0$ one would have extension of extension. Z_3 confinement would require 3-photon states, which are Z_3 singlets with number theoretic colors summing up to zero. One would obtain only 3-chords. Ordinary photons would be Z_3 singlets.

3. Also the 3 protons of DDNA codon could form Z_3 triplet. Number theoretic color confinement would allow only 3-proton triplets. Genetic code is predicted correctly and the number letters in the codons is predicted to be 3.

This raises two interesting questions.

1. Quantum-classical correspondence (QCC) is a exact part of TGD. Therefore I have considered the possibility that all physical symmetries could have number theoretical space-time correlates. However, at space-time level one cannot have representations of color group with non-vanishing triality $t = 0, \pm 1$. Same applies to spin half-odd integer representations of rotation group. Could $SU(2) \times SU(3)$ representations with triality $t = \pm 1$ and spin half-odd integer have triplet representation of Z_3 and double representation of Z_2 as space-time correlates? Z_6 would be the minimal Galois group allowing to realize spin and color for quarks.

2. Number theoretical physics predicts that Galois group for any extension of rationals acts as new hidden discrete symmetry. Could number theoretical confinement implying new selection rules be true quite generally? The larger the degree n of extension (h_eff), the larger the scale in which confinement holds true, is. For instance, genes could be analogs of color singlet many particle states for a larger subgroup.

This is not the only option. I have already earlier considered with Peter Gariaev [L12] a proposal in which dark photons would communicate the genetic information from A to B. The problem is how the massless extremals (MEs) [K5] associated with them can be parallel and of same length: this would require that they form a quantum coherent entity. Could one consider a modification of the above proposal assuming that gene is an entity of N codons confined number theoretically? Could one can speak about dark photon genes as composites of N dark photon 3-chords? The information would be sent by dark photon gene representing entire music piece, as one might say. In chamber B energy-frequency resonance would generate a linear configuration of exotic codons, which would reduce to DDNA-DNA pair when h_{eff} is reduced.

2 DDNA-DNA, DDNA-DDNA, DDNA-exotic DNA pairings

The idea about MB as boss of BB suggests that DNA is accompanied by DDNA. DDNA would be the fundamental DNA and ordinary DNA emerged later as a kind of mimicry and there would be DDNA-DNA pairing.

The basic problem problem is that DDNA codons do not allow decomposition into letters like DNA codons. It seems that replication and transcription must occur codon by codon rather than letter by letter. For translation of mRNA this is indeed the case: tRNA are the basic objects. Could this be true in modified sense also for replication and transcription? In fact, RNA can replicate in codon-wise manner [L13]. Could this occur quite generally, and could the codons for replication believed to occur letter-wise be present in a latent manner?

2.1 DNA and DDNA codons

At least 3 new kind of codons are predicted (`http://tinyurl.com/yygqen5g`).

1. Also ordinary DNA codons involve flux tubes. Valence bonds between nucleotides of DNA strand and hydrogen bonds in double strand involve flux tubes or pairs of them.

2. DDNA codons are paired with ordinary DNA codons of DNA strand. DDNA codons would correspond to dark proton triplets at flux loops being analogous to tritium and ^{3}He. The model for remote replication requires that DDNA codon loops are connected to long closed dark gene flux loop by U-shaped appendages - attached to dark gene.

   If DDNA and DNA codons are paired with ordinary DNA by energy resonance there is no need for flux tube contacts between the triplets.

3. Dark codons as dark photon 3-chords are predicted. Couple to DDNA by energy-frequency resonance and to DNA by energy-resonance.

4. Exotic DNA codons are required by the model of replication. DNA nucleotides in environment would combine to exotic codons paired with DDNA codons.

2.2 What various pairings do look like?

There would be 3 kinds of pairings. This would predict that nucleotides appear as apparently free entities in the water environment.

1. DDNA-DNA pairing in DNA strand. Different values of h_{eff} do not allow flux tubes contacts. Energy resonance only.

2. DDNA-DDNA pairing in DNA double strand is not necessary in geometric sense as flux tube connections because hydrogen bonds pair DNA codons and energy resonance pairs DDNA strands to DNA codons. DDNA codons could be however located along dark gene flux tube and attached to it by flux tube pairs.

3. DDNA-exotic DNA pairing would take place in environment. Nucleotides of exotic DNA would be attached to closed DDNA codon flux tubes. h_{eff} would be larger than for DDNA codon in double strand. There would be no valence bonds between nucleotides. The ordering of letters would be forced by flux tube containing the dark codon and energy resonance. One obtains correct codon if the orientation of the flux tube matters (ABC and BCA correspond to different energies in energy resonance). Strong parity breaking allowed by TGD and realized in living matter would imply it.

   This would solve the basic problem. Codon would be secretly present since there would be no valence bonds, which together with small string tension would mean that nucleotides are effectively free.

4. It is of course not clear whether this is enough to explain experimental findings. If one can demonstrate experimentally that the build-up of DNA strand in replication really occurs in letter-wise manner, the proposed model must be modified (not of course clear whether this is possible). The codon-wise coding, which can occur for RNA [L13] could be understood if the value of h_{eff} for DRNA strand can be same or nearly the same as in RNA strand.

REFERENCES

Biology

[I1] Montagnier L et al. DNA waves and water. Available at: `http://arxiv.org/abs/1012.5166`, 2010.

Neuroscience and Consciousness

[J1] Blackman CF. *Effect of Electrical and Magnetic Fields on the Nervous System*, pages 331–355. Plenum, New York, 1994.

Books related to TGD

[K1] Pitkänen M. Homeopathy in Many-Sheeted Space-Time. In *Bio-Systems as Conscious Holograms*. Available at: `http://tgdtheory.fi/pdfpool/homeoc.pdf`, 2006.

[K2] Pitkänen M. Quantum Model for Bio-Superconductivity: I. In *TGD and EEG*. Available at: `http://tgdtheory.fi/pdfpool/biosupercondI.pdf`, 2006.

[K3] Pitkänen M. Quantum Model for Bio-Superconductivity: II. In *TGD and EEG*. Available at: `http://tgdtheory.fi/pdfpool/biosupercondII.pdf`, 2006.

[K4] Pitkänen M. Quantum Mind, Magnetic Body, and Biological Body. In *TGD based view about living matter and remote mental interactions*. Available at: `http://tgdtheory.fi/pdfpool/lianPB.pdf`, 2012.

[K5] Pitkänen M. About Preferred Extremals of Kähler Action. In *Physics in Many-Sheeted Space-Time: Part I*. Available at: `http://tgdtheory.fi/pdfpool/prext.pdf`, 2019.

[K6] Gariaev P Pitkänen M. Quantum Model for Remote Replication. In *Genes and Memes: Part I*. Available at: `http://tgdtheory.fi/pdfpool/remotereplication.pdf`, 2019.

Articles about TGD

[L1] Pitkänen M. Geometric theory of harmony. Available at: `http://tgdtheory.fi/public_html/articles/harmonytheory.pdf`, 2014.

[L2] Pitkänen M. More Precise View about Remote Replication. Available at: `http://tgdtheory.fi/public_html/articles/dnabobs.pdf`, 2014.

[L3] Pitkänen M. Pollack's Findings about Fourth phase of Water : TGD View. Available at: `http://tgdtheory.fi/public_html/articles/PollackYoutube.pdf`, 2014.

[L4] Pitkänen M. About Physical Representations of Genetic Code in Terms of Dark Nuclear Strings. Available at: `http://tgdtheory.fi/public_html/articles/genecodemodels.pdf`, 2016.

[L5] Pitkänen M. p-Adicization and adelic physics. Available at: `http://tgdtheory.fi/public_html/articles/adelicphysics.pdf`, 2017.

[L6] Pitkänen M. About the Correspondence of Dark Nuclear Genetic Code and Ordinary Genetic Code. Available at: `http://tgdtheory.fi/public_html/articles/codedarkcode.pdf`, 2018.

[L7] Pitkänen M. Emotions as sensory percepts about the state of magnetic body? Available at: `http://tgdtheory.fi/public_html/articles/emotions.pdf`, 2018.

[L8] Pitkänen M. New results in the model of bio-harmony. Available at: `http://tgdtheory.fi/public_html/articles/harmonynew.pdf`, 2018.

[L9] Pitkänen M. An overall view about models of genetic code and bio-harmony. Available at: `http://tgdtheory.fi/public_html/articles/gcharm.pdf`, 2019.

[L10] Pitkänen M. Multilocal viruses. Available at: `http://tgdtheory.fi/public_html/articles/viralstrange.pdf`, 2019.

[L11] M. Pitkänen. DNA and Water Memory: Comments on Montagnier Groups Recent Findings. *DNA Decipher Journal*, 1(1), 2011.

[L12] M. Pitkänen. Quantum Model for Remote Replication. *DNA Decipher Journal*, 1(3), 2011.

[L13] M. Pitkänen. Did RNA Replicate in Codon-Wise Manner during RNA Era? *DNA Decipher Journal*, 8(2), 2018.