



## Selenium supplements prevent cardiovascular disorders and cancers of breast and bowel

### KEYWORDS

Proton ordered hydrogen bonds, Ice Xlc, Transport DNA, Selenium.

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### ABSTRACT

**Objectives:** Dietary prevention of hypertension associated morbidity. **Design:** Ice crystallized in liquid nitrogen underwent a phase transition emitting infrared radiation. Phosphodiester bonds absorb its wavelength, suggesting it forged primordial DNA including tRNA analogues, 'transport DNAs' actively transporting substrates through cell membranes. Transport DNAs complement barrels of  $\alpha$ -helices. Extrapolation from animal husbandry explained many ailments and the origin of life. Analysing computer programming languages suggested the 'minion' DNA-protein complex, comprising 189 anti-parallel  $\beta$ -pleated sheet hairpin proteins with alternate A, L, I & V and K, R residues, P forming an asymmetric U-bend binding 1,701 uncoiled DNA base-pairs retaining B-helical overlap and spacing. Evolved to pack and replicate chromosomes efficiently, minions serve as 'brain chips'. They control nine biochemical pathways, facilitating medical diagnosis. Amalgamated data supports my model for blood pressure control. **Setting:** Physical, [bio]-chemical, endocrinological and medical literature supported my deductions. Research on enzymatic catalysis ignores principles evolution's established. Empirical evidence for transport DNAs is needed, they elude sequencers' attention. **Participants:** I work alone, accommodating correspondents' criticisms. Readers may implement proposals in 'Science Uncoiled' (Melrose Press). **Main outcome measures:** Dietary supplements have countered scurvy, beriberi and tooth decay. Breast cancer epidemiology suggests widespread selenium deficiency. Public education and trials would counter opposition. **Results:** The model consistently makes valid predictions. **Conclusions:** Allowing for familial inheritance, better diets could prevent heart attacks, strokes, cancers of breast, colon, prostate and cervix and eclampsia.

### Origin of life

Water's a fascinating molecule, life depends on it. Linus Pauling showed<sup>1</sup> the arrangement manifest in the beautiful shapes of snow-flakes is imperfect, the entropy persisting on cooling to absolute zero,  $-273^{\circ}\text{C}$ . Laue<sup>2</sup> identified 230 ways molecules can be arranged in crystals, ice adopts 16 of them. They all obey the ice rule – each tetrahedral water molecule forms a hydrogen bond with four neighbours. Diamond crystals' strength depends on every carbon atom being a regular tetrahedron – even a matchstick and putty model is robust.

Ignoring the instructions for a physics class at Cambridge in 1967 yielded surprising results. Everyone should have a chance to try it at school. A Thermos flask full of liquid nitrogen is fitted with a silica helium thermometer and water is added to seal the bung. Some trickling down makes nitrogen boil, forming a thin ice film on the bulb. Reducing the pressure with a vacuum pump lowers the boiling point of nitrogen. The Clausius Clapeyron relation dictates that boiling point correlates with pressure, predicting a straight-line graph, I obtained a hysteresis loop.

I read that cubic ice<sup>3</sup> sharing diamond's structure, Figure 1, was the stable form at low temperatures, suggesting irregular tetrahedral water molecules align themselves on crystallizing and the ice film had squeezed and stretched the thermometer. My mentors had read Kurt Vonnegut's apocalyptic science fiction *Cat's Cradle* about the oceans solidifying as ice nine and ridiculed the idea. In 2015, reports of ice Xlc slowly crystallizing with a phase transition at  $72^{\circ}\text{K}$  corroborated it.

The surface temperatures of moons and planets are consistent with ice Xlc crystallizing on Earth's poles during a primordial ice age. Ordinary surface and cloud ice reflects infrared light of wavelength 4  $\mu\text{m}$ , transmitting it like Marconi's trans-Atlantic radio signals. Charles Darwin's warm tropical waters are now known to contain deoxynucleotides. Ferroelectric transitions usually emit latent energy as laser light. Its calculated wavelength,  $\sim 4$ ,

corresponds to phosphodiester bond energy. The synthesis of DNA constituted order emerging from chaos. Polarized by reflection, laser light reaching warm primordial soup created DNA, being more stable than RNA, its accumulation is more probable.

### Chromosome structure

Before discussing the course of evolution from DNA to differentiated metabolism, I introduce a second postulate. Noting that IBM 360 and Commodore PET computers' instruction sets could be reduced to nine machine-code operations was key to understanding how our minds work. How could DNA store intellectual information? I had used Fortran to write simple algorithms and plot 3D stereo diagrams and sought precedents in historic philosophies for reducing thought to combinations of nine abstract concepts.

Occult traditions are replete with parallels. Astrological personality classifications, base-9 numerology, Arabic numerals, language structure, Moses' ten commandments, the prophecies of Nostradamus and the I Ching all imply the existence of a universal infrastructure. Models of uncoiled DNA retaining B-helical base-pair overlap and spacing matched anti-parallel  $\beta$ -sheet geometry, Figure 2. Proline imposed asymmetry yielding 9-coil units dubbed 'minions'. They pack DNA on chromosomes more neatly than nucleosome core particles.

### Life's logic

Minions are 18-rung coiled abaci, each rung having 63 beads, they span  $\sim 103$  octaves, imposing limits on perception corresponding to Heisenberg's uncertainty and Lemaître's age of the universe. They use exponentiation to multiply and divide; transferring patterns between rungs is equivalent to transposing music between keys and impose qualities on stored information. They may be understood by considering life divided into nine seven-year periods, c.f. Shakespeare's

poem, Seven Ages of Man. Used for medical diagnosis, they focus attention on the metabolic system most likely to need attention.

Concentration is prerequisite for chemical reactions. Early X-ray diffraction images of transfer RNA<sup>5</sup> revealed an H-bond-lined hole, see Figure 3. Life's simplest starting point appears to be 'transport DNA', serving to concentrate substrates in Oparin's coacervates.<sup>6</sup> Electric storms established a membrane potential aligning the H-bonds, they absorbed ~ 4 generated by the ice transition. In modern life, exchange of 3 sodium for 2 potassium ions maintains membrane potential and adenylcyclase releases phosphodiester energy from ATP as ~ 4. It excites the H-bonds lining transport DNA pores, driving a ratchet mechanism; the residual electric field propels charged complexes through the membrane.

Model building and literature searches have revealed a family of complexes stable in the electric field pervading transport DNAs. The predicted ~ 2000 transport DNAs residing in every cell membrane, first evidenced by a ring around the entry point of sperm to ovum,<sup>7</sup> have evaded sequencers' attention. Their activity complements and is indistinguishable from that of barrels of -helices. The ratchet mechanism driving active transport is more efficient than conventional schemes invoking diffusion and channels opening and closing.

**Active transport of water**

Eight metabolic pathways accounted for many common ailments, minion logic suggested a ninth. Physicians prioritise measuring pulse rate and blood pressure, the active transport of water maintains steady blood pressure. Lewis Carroll told of life in a treacle well,<sup>8</sup> when surrounded by water, it's hard to control. Plants expend most of their energy constructing cellulose cell walls to retain it. Mitchell based his chemiosmotic hypothesis<sup>9</sup> on the assumption that water diffuses freely through membranes, equilibrating osmotic pressure, membrane potential invalidates it.

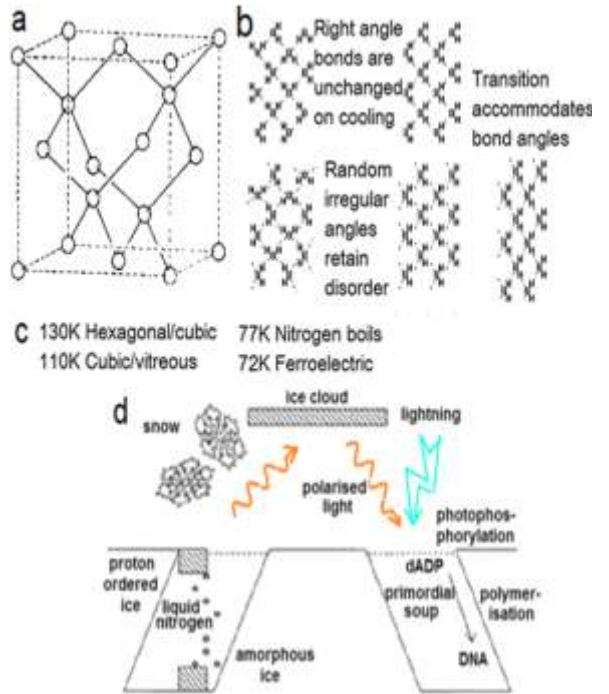
Mevalonate, named after herb Valerian, aka All Heal is the residue of saturated fat breakdown,<sup>10</sup> reversibly forming mevalonolactone. Figure 4 illustrates how transport DNAs exchanges them, transporting water. Posterior pituitary hormones oxytocin and vasopressin incorporate selenium Vitamin E, -tocopherol carries energy as solitons<sup>11</sup> at their target sites, converting selenium from -S-Se- bonds to selenite, SeO<sub>3</sub>=. Selenite delivers Mn<sup>++</sup>, cofactor for enzymes converting excess mevalonate to cholesterol.<sup>12</sup> Oxytocin substitutes for vasopressin during reproduction, prostaglandins may provide osmotic support for sperm, egg and foetus during reproduction.

**Associated pathologies**

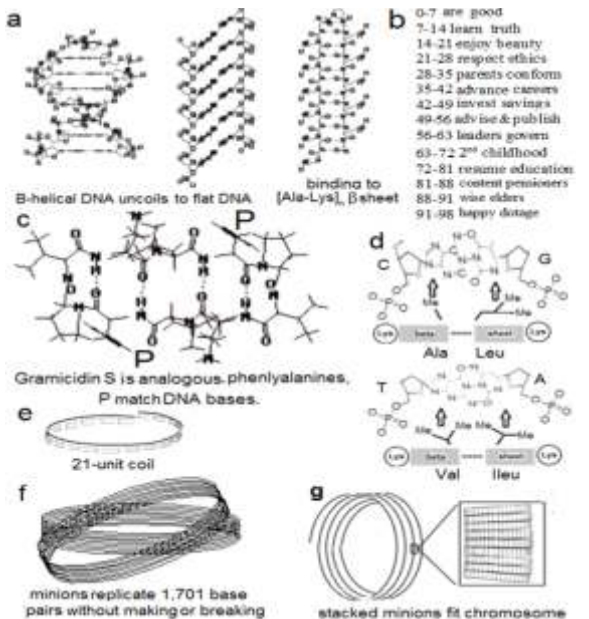
Heart attacks, strokes, cancers of tissues differentiated to pump water (breast, colon, prostate and cervix) and hypertension during pregnancy are attributable to defective water transport. Figure 5 indicates eight stages susceptible to intervention. The Five a day campaign to prevent cholesterol blocking arteries has had relatively little effect on morbidity. Food processing reduces Se availability. Cretaceous rocks include the fossilised remains of early life. After subduction, volcanoes recycle them, introducing selenium to igneous rocks. Hard water and that percolating through volcanic rocks consequently provides more selenium than soft water, as evidenced by the persistent correlation between the incidence of breast cancer and surface geology.<sup>13</sup>

Sea-floor manganese nodules may date from early life. Methyl

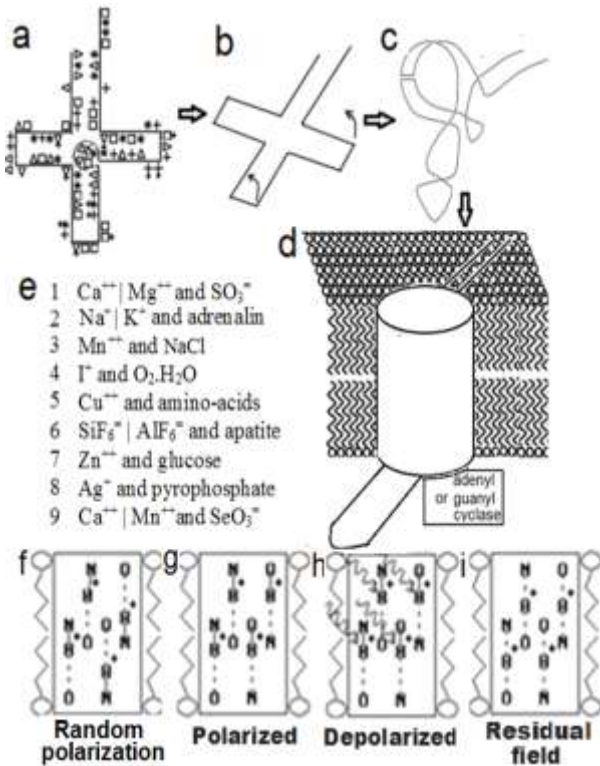
mercury competes with trimethyl-selenium for access to the pituitary. Sulphur in super-phosphate fertilizers reduces selenium availability, causing swayback in sheep. Selenium deficient pigs are liable to heart attacks en route to market. Selenium supplements would be cheaper than complex and expensive pharmaceuticals, surgical operations and other treatments for high blood pressure. Promoting them could counter the pandemic of deaths from selenium deficiency, see www.scienceuncoiled.co.uk.



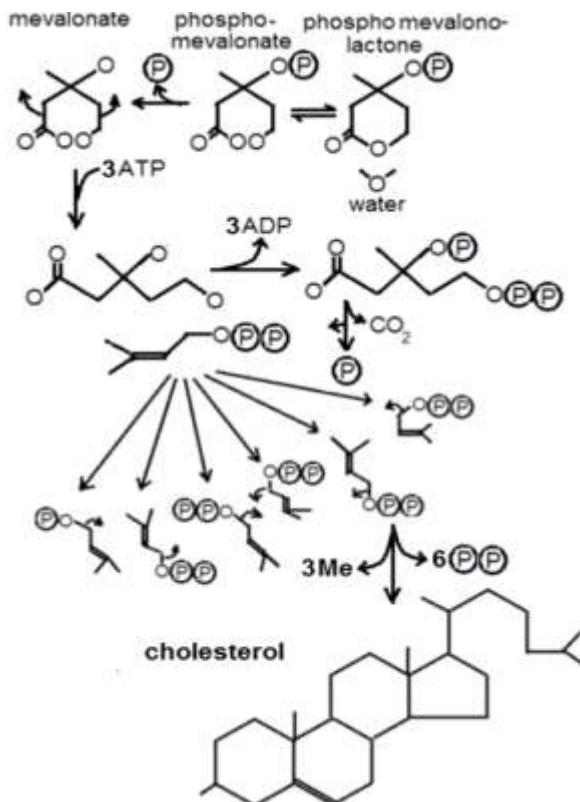
**Figure 1** a Diamond structure, b Two-dimensional representation of phase transition, c Transition temperatures, d Origin of life



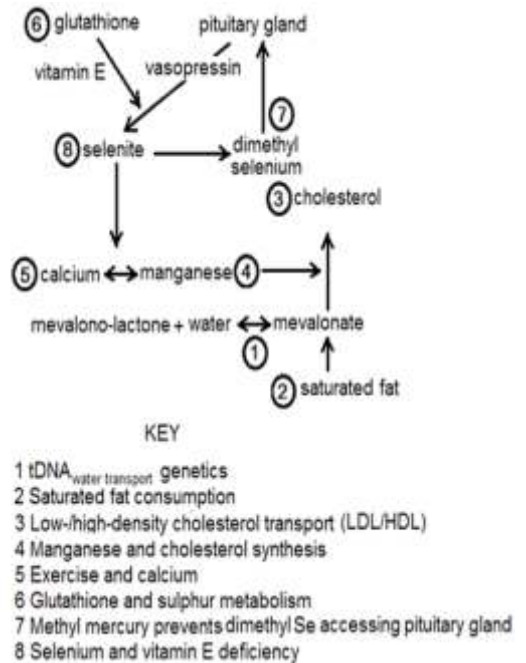
**Figure 2** a DNA binds to  $\beta$ -pleated sheet b Activities versus age c Gramicidin S d Amino acids & bases e Minion coil f Minions copy g Minions pack chromosome



**Figure 3** a-c DNA folds to form transport DNA d Transport DNA in unit membrane e Substrate-carrier complexes f-i Ratchet mechanism



**Figure 4** Phospho-mevalonate and phospho-mevalonolactone transport water, surplus mevalonate is converted to cholesterol.



**Figure 5** Controls on blood pressure

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