The Pattern Pieces

Folder 5

The Pattern Cell

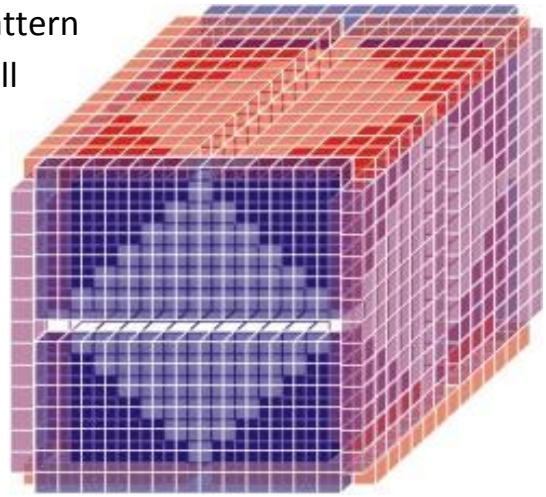
"Life's code was caused by a crystallizing earth."

The Pattern Cell is a model of the elementary component types needed for life, i.e. genes, proteins and membranes. The role of the higher-dimensional duonity in a cell's architecture and functioning is highlighted. A key discovery is that the genetic code could be part of an encoded record (history) of the staged collapse of an original duonity earth.

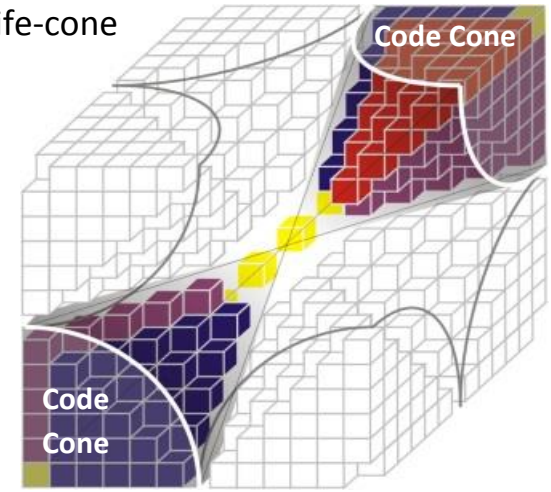
Another name for the Pattern cell is the *Geometric Standard Model of Life Elements*.

This Pattern cell hypothesis is based on the Pattern Cube, which is also the model for the Geometric Standard Model (GSM). The GSM is the proposed architecture for the Standard Model of Elementary Particles, and it is described in the Pattern Pieces Folder 4.

The Pattern Cell



Life-cone



The Pattern cell architecture is based on the Pattern Cube (see Folder 3 *The Pattern Numbers*). The Pattern Cube consists of seven concentric cubes. It is also a cube of cones, three Light-cones and four Life-cones. One of the Life-cones is shown above (see Folder 4 for a diagram of a Light-cone). One Life-cone consists of a pair of diagonal (virtual) code chains inside a pair of code cones.

The Pattern Cell proposes an architecture for the basic structural elements of life, and it should not be taken as the structure of any particular living cell.

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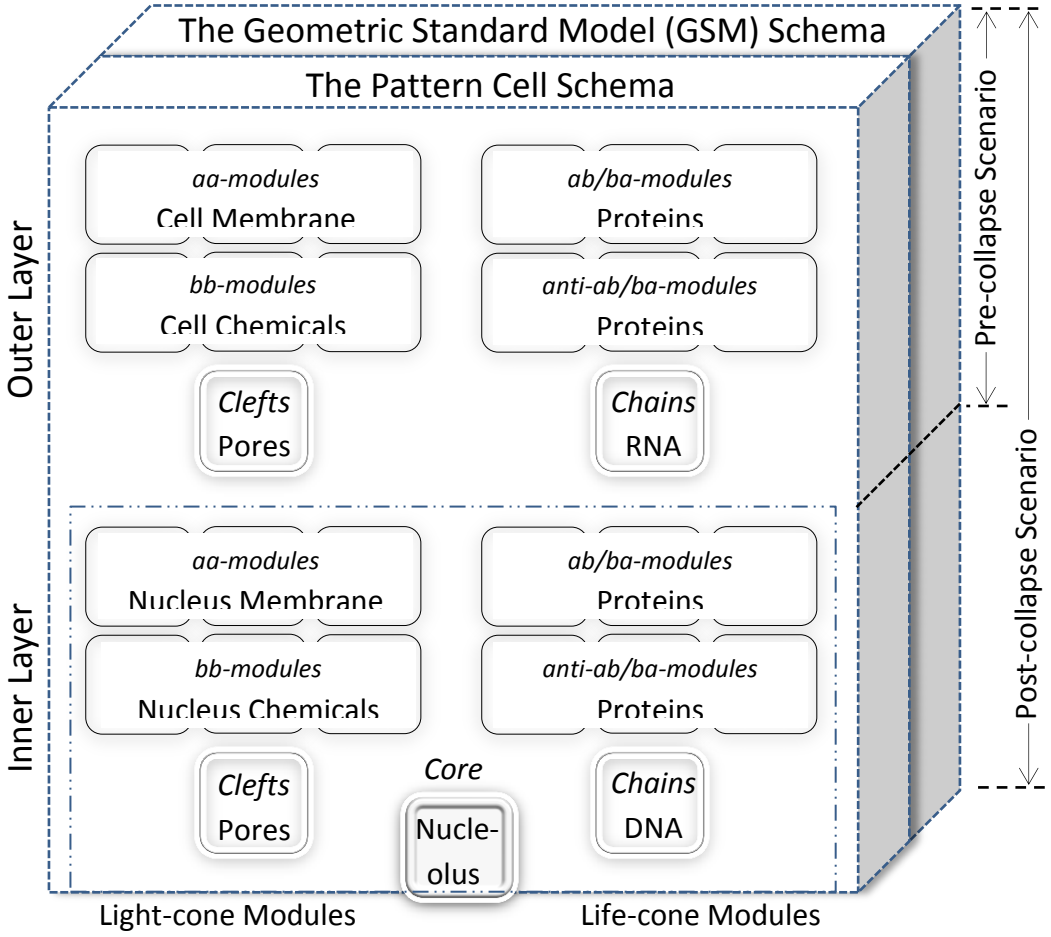
The Pattern Cell Schema

The Pattern Cube, on which the Pattern cell *schema* is based, consists of a cover, a content layer and a core. The postulated collapse of the original creation (see P05:3), however, caused another layer to form by replacing the core with a copy of the Pattern Cube. The extended Pattern cell *schema*, with both an Outer content layer and an Inner content layer, is shown below.

(The collapsed Pattern cell with an Outer layer and an Inner layer is the one referred to in this article unless the contrary is indicated.)



The different modules of the Pattern Cube (aa, ab, ba, bb) are shown together with the types of components of the cell that they represent. (The naming of the modules is explained in P05:4.) Proteins are mechanisms that are composed of the chemicals, but they also use the chemicals.

The elementary component types of life, i.e. genes (code chains), proteins (code cones) and membranes (covers) are analogous to a computer's programs, processors and interfaces. The functioning of a cell could also be compared with the functioning of various parts of a computer. Similarities between cells and computers are highlighted throughout this article.

The Pattern cell *schema* is identical to the Geometric Standard Model (GSM) schema as described in Folder 4.The GSM is a proposed architecture that accommodates and relates all the different components of the Standard Model of Elementary Particles. It also accommodates gravity, which is not included in the Standard Model as well as quantum gravity.

The Pattern cell hypothesis extends the GSM hypothesis into a combined hypothesis for all things that exist, organic as well as inorganic.

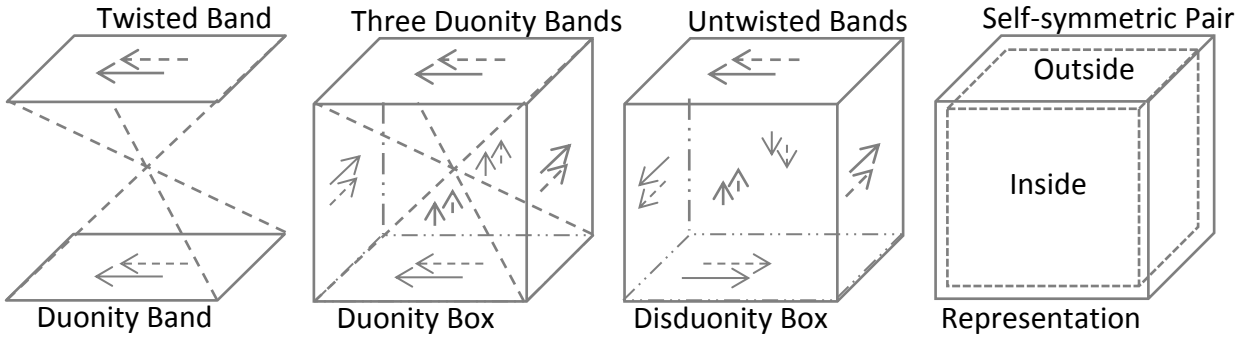
The Pattern Cell Duonity

The Pattern cell *schema* (see P05:2) represents a collapse hypothesis by its pre-collapse and post-collapse scenarios. The pre-collapse scenario refers to a higher-dimensional duonity state while the post-collapse scenario refers to a lower-dimensional disduonity state.

Duonity

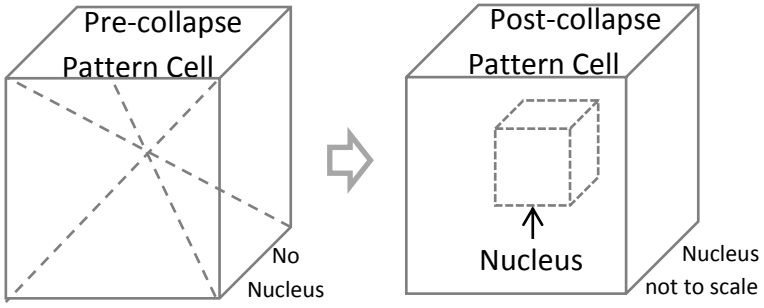
Duonity is the principle of the Pattern, and it is defined as the two-oneness of things, which is a kind of superposition. Duonity objects exist in a dimension higher than do those of its self-symmetric collapsed disduonity components. (The self-symmetry immanent in duonity objects manifests only when a duonity object collapses into disduonity.) Disduonity is defined as the two-ness of things.

The properties of a Mobius (or Möbius) band could be used to illustrate the duonity concept. The twisted band diagram below (left) shows a special type of Mobius band in the shape of a pyramid pair.



The arrows show that the duonity band has one side only. Three such orthogonal twisted bands form a twisted (duonity) box (with adjacent faces of the box that are unconnected). The twists inside the box could be untwisted (collapsed), like Mobius bands that are cut across, and this yields a disduonity box with an outside as well as an inside. These two sides of the box form a self-symmetric pair of which only the outside is 'visible'. A typical representation of this self-symmetric 'pair of boxes' is shown above.

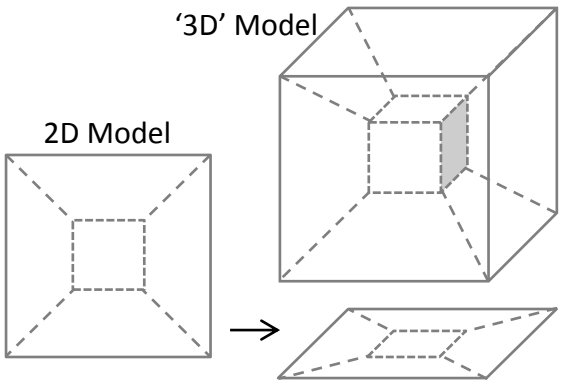
The untwisting of a duonity box (the pre-collapse cell) yields a disduonity box (the post-collapse cell).



The pre-collapse Pattern cell (duonity box) contains the three twists of three bands.
The collapsed Pattern cell (disduonity box) contains a self-symmetric 'nucleus' as the inside box.

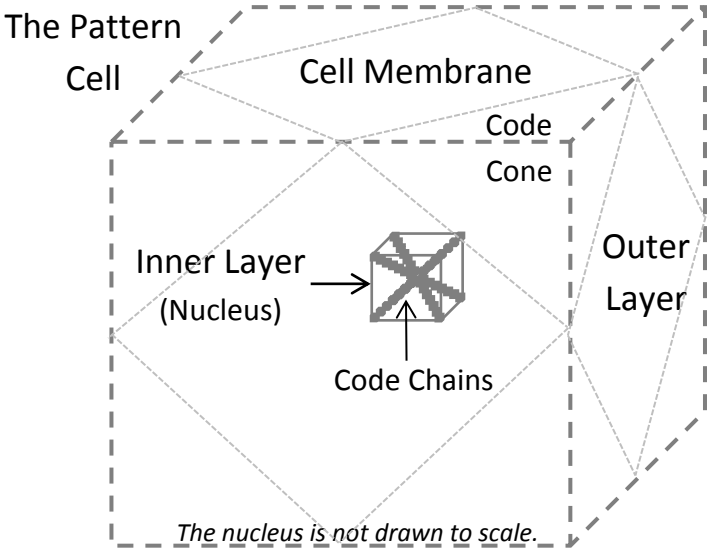
Hypercube (4D Cube)

A drawing (2D model) of a 3D cube (two stacked squares) is shown on the right. The four dotted line diagonals represent the 3rd dimension.
A drawing of a 4D cube (two stacked cubes) is shown on the far right. The eight dotted line diagonals represent the 4th dimension. A 3D model has eight diagonals from the core to the vertices.



The Pattern Cell Inner Layer

The Pattern cell model consists of an Inner layer (the nucleus), the Outer layer (with cytoplasm) and the cell membrane (see P05:2). The nucleus contains the nucleolus at its core. The nucleus also contains the chromosomes with their encoded DNA chains. The diagram below illustrates the components.



The chromosome chains in the nucleus are DNA chains. The chromosomes are kept in a folded state except when replication takes place.

DNA is the same as RNA except that the uracil (U) base is replaced by the thiamine (T) base of DNA. The DNA genes serve as a type of program code that is copied to become tRNA working code. The tRNA is then translated into proteins. Proteins have intricate 3D shapes that fit their functions.

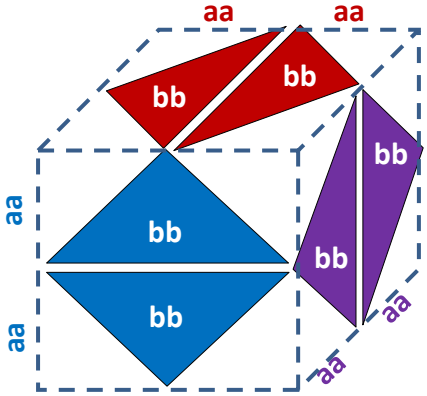
The Learning Cell

The genes of a living cell are kept safely inside the nucleus, but they are accessible for copying and/or switching. Their modification and/or activation depend(s) on the conditions present inside and outside the cell (see P05:6). Gene modification is central to a cell's ability to learn and to reflect changes in conditions affecting the cell. The genes serve as a kind of dynamic reference library that reflects the genetic status of the cell based on the 'learned' conditions that have prevailed. Genes are like the instructions of a computer program and they could also, similarly to program code, be addressed directly based on their loci (their locations).

The core of the (collapsed) Pattern cell can be compared to the nucleolus of a living cell. The nucleolus is inside the nucleus, and it is vital in the process of making working structures, such as ribosomes, from protein. It seems to serve as a kind of brain for the functioning of the cell.

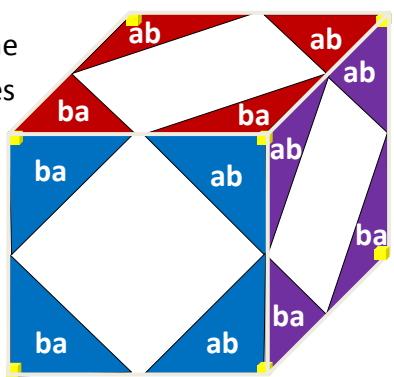
The Pattern Cube Module Naming

The naming of the Pattern Cube's modules is derived from the terms of the squared Pattern equation $(a + b)^2 = aa + ab + ba + bb$. See the Pattern Pieces Folder 3 for detail of the modules.



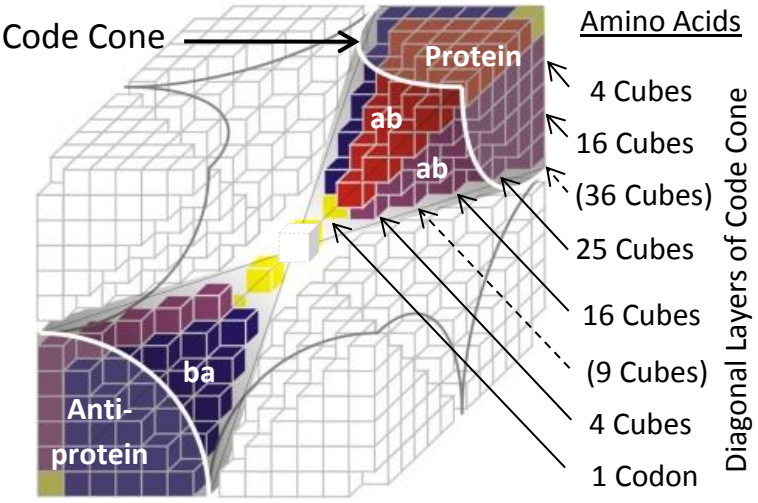
Light-cone Modules

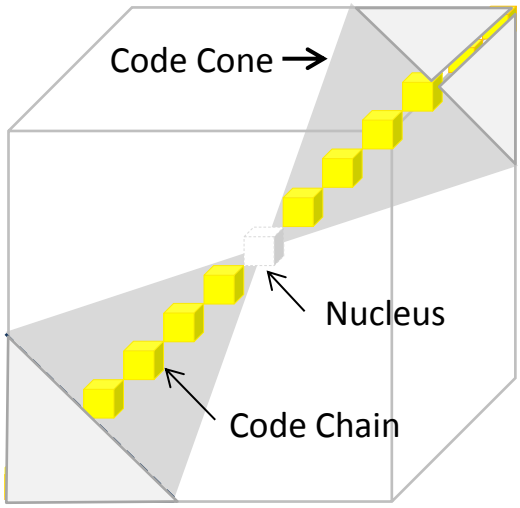
Life-cone Modules



The Pattern Cell Outer Layer

The Outer layer of the Pattern cell is the main working space of the cell. The eight virtual chains of the Outer layer represent RNA genes. The six codons of each gene form the backbones of amino acid side groups. (An amino acid consists of a backbone with a side group – a group of chemical atoms [molecules] that range in size.) The side groups form protein cones that match the ab/ba-modules of the Pattern cell. The cones consist of combinations of three ab/ba-modules, as shown below.

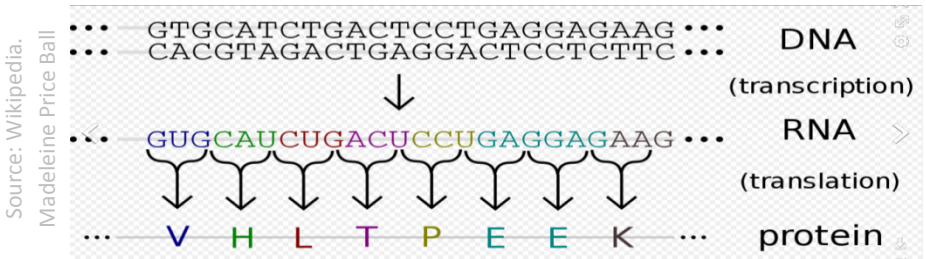




The number of cubes in the diagonal layers of a code cone are 1^2, 2^2, 3^2, 4^2, 5^2, 6^2, 4^2, 2^2. Layers 3^2 and 6^2, however, do not incorporate codon backbones and they, therefore, do not represent amino acids but only side group extensions. Layer 1^2 has only a backbone, but it could be linked to the side group of layer 2^2 and the layer 2 backbone could be linked to the layer 3 side group that has no backbone.

The Working Cell

The processes in a living cell could be simplified as shown below. The RNA codon sequences are working copies of DNA genes. The RNA codons are translated into proteins by proteins, e.g. ribosomes. A ribosome's shape is determined by its code, and its shape determines its functioning. The ribosome's functioning is a good illustration of the key role that geometry plays in a cell's operation.



Life works with codes: code chains and code cones.

Proteins use chemicals in the execution of their functions. Specific chemicals that are used in cells are carbon, hydrogen, oxygen, nitrogen, sulphur and phosphorus. The chemicals are structured according to the GSM, but they are organized in molecules that are suitable for use by the cell's proteins. (In a computer context, protein folding could be compared to the 3D printing of specific geometric shapes.)

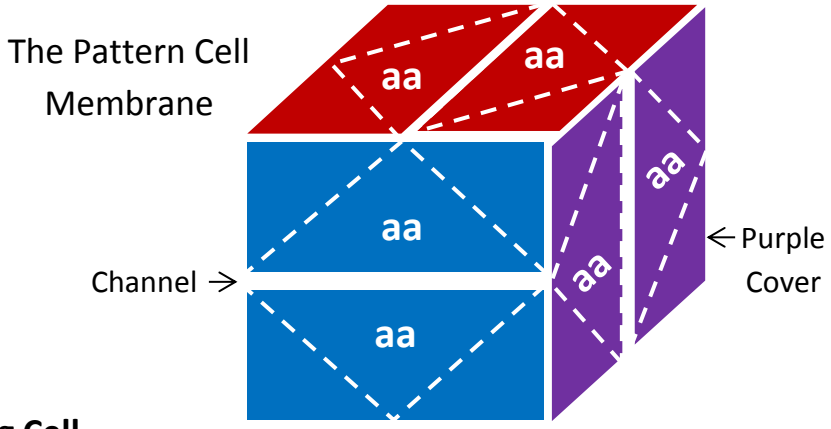
The proteins of the living cell serve as the cell's machinery that makes more machines and more cells.

A living cell could be compared to a robot factory, consisting of robots making robots, that is making more robot factories.

The Pattern Cell Membrane

A living cell's membrane is its interface with the bodily organ of which it is a member. The membrane also protects the cell to create a stable environment for its optimal functioning. It forms a protective barrier similar to skin and has pores that serve as channels between the inside and outside of the cell.

The Pattern cell model's six faces are covered by twelve aa-covers. (Each cover consists of a middle part indicated by dotted lines that is an extension of the bb-module underneath and two symmetric corner parts that serves to extend the ab/ba modules underneath inside the covers.) The covers of opposing faces are red, purple and blue. Each pair of covers is separated by a cleft that represents the pores, or channels, of the cell membrane as shown below.



The Communicating Cell

All living cells communicate and cooperate extensively. The membrane of a cell is its interface between the cell itself and its environment. The spatial awareness maintained by the membrane is vital to the cell's orientation and functioning as part of an organ inside a body.

The ability of the membrane to act as protection, channel, sensor and communicator is key to the cell's survival and role in the cell communities. The cell membrane consists of two layers of phospholipid molecules that contain pores that open and close to allow different types of molecules to enter and to exit. The membrane can even act like a mouth by swallowing materials it wants to 'eat', or absorb.

A cell communicates by signaling and messaging interactively, but it could also broadcast. Spreading morphogen molecules guide the development of organs, such as limbs and also the brain.

Epigenetics

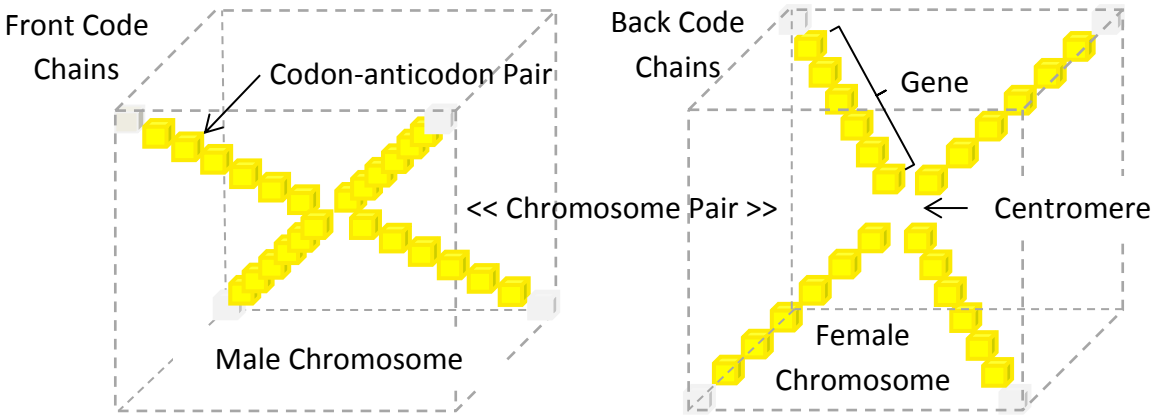
The discovery that inputs from the environment could trigger modifications to the cell's DNA, resulted in a reconsideration of the way life works. The process of modification is called epigenetics (epi means 'above') and the adapted genome of the cell is called an epigenome. Epigenetics seem to have resolved the long-standing nature v nurture conflict. Genes are used (switched, expressed, silenced) based on conditions inside the cell as well as on conditions outside the cell.

The role of the membrane in the selection and conveying of the stimuli from outside is very important. It seems even to exhibit a kind of intelligence in the processing of these signals.

Research into the holographic principle as a possible explanation of the membrane's 'intelligence' could perhaps yield surprises. The holographic principle states that the surface of a black hole, for example, contains all the information of the mass inside the black hole. (The Pattern cell's aa-covers are indeed a compressed [2D] version of the [3D] bb-modules of the inside of the cell.)

The Pattern Cell Couple

The X-shaped chains of the Pattern cell's nucleus match the structure of a living cell's chromosomes. The Pattern cell chromosomes consist of four genes of six codons each. Each link (a virtual cube) of a chain represents one codon-anticodon pair. The six faces of each link cube represent three base pairs. (Three faces of each link cube could also represent only a codon or an anti-codon, like RNA codons.)
The eight code chains of the Pattern cell could be split into two X-shaped chromosomes, one male and one female chromosome, as shown below. Each X-shaped chromosome consists of a replicated chromosome, i.e. a chromosome with its copy.



Each chromosome of the Pattern cell has a centromere where pairs of chromosomes could connect when they are replicated or where spindle fibres could attach during cell division.

The genes of a Pattern cell could be identified by their *loci*. *Loci* are comparable with the Pattern State Identities (PSIs) of the Pattern Cube. The PSI system is based on the quantum numbers and is a GPS-like spatial address for each cube of the Pattern Cube (see *The Pattern of All Things* in thepatternbook.com).

Archaeogenetics is the reconstruction of human history from mutations in genes. Genes could be used as records to be searched for evidence of changes to chromosomes in past generations. Different generations of chromosomes are, therefore, analogous to different versions of computer programs.

The Conducting Core (Cell Type: Basic Cell)

According to the Pattern cell *schema* (see P05:2) the nucleus (the Inner layer) emanated when the original duonity Pattern cell collapsed. The operation of a cell with two layers is much more complicated than a cell with only one layer, and it requires exceptional coordination to function properly. The nucleus seems to be 'cell aware' and knows and controls all that is happening inside the cell. (The nucleus also determines what is happening outside the cell by means of its Hox type genes [see P05:8].)

The types of genes of a cell, their functions and relative positions on chromosomes (their geometrical attributes) are somehow 'known' by the nucleus. The necessary 'knowledge' appears to be encoded in the nucleus.

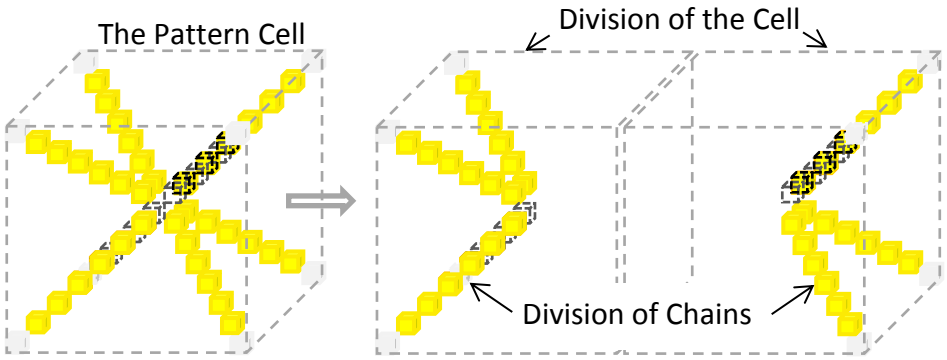
The functioning of the nucleus could be compared to the conducting of an orchestra. The conductor uses a music sheet and has knowledge of each player's role and position in order to conduct the orchestra. The music sheet contains notes of the music code, a 7-layered code with 'do, re, me, fa, so, la and ti' notes that were encoded by the composer.

The conducting core orchestrates a symphonic cell; its every note is played to perfection.

The Pattern Cell Division

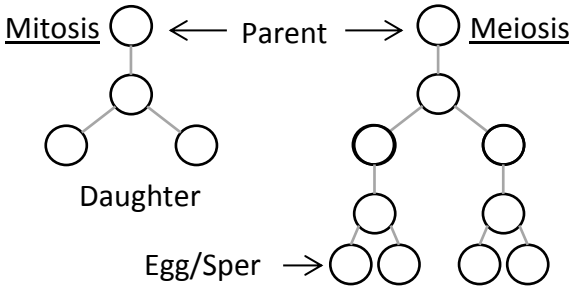
The Pattern cell's architecture facilitates division. The core of the nucleus is the single component that 'glues' all the components of the cell into a cohesive unit.

The diagram below shows the division of the code chains in the nucleus (if the double dotted lines are ignored) and also the division of the cell (if the double dotted lines are not ignored). The division of the code chains enables code copying, which is the replication of the Pattern cell's chromosomes.



Division of a living cell could happen in two ways, by mitosis and by meiosis. Mitosis is the process whereby a parent cell duplicates itself by dividing into two daughter cells, a 'horizontal' division to prepare for the specialization of cells into organs. The 'vertical' division of a cell, for the purpose of creating the new generation, is called meiosis (see also P05:9).

Mitosis is the type of cell division that creates duplicate cells, and meiosis is the type of cell division that creates egg and sperm cells.
Each cell division adds yet another version of lineage information contained in a cell's DNA. DNA, therefore, serves as an hereditary record that could be used to trace a cell's ancestry.



The Conducting Cell (Cell Type: Body Cell)

The nucleus of a living cell conducts the functioning of a cell (see P05:7), and living cells, e.g. eggs, conduct the formation of a whole body. The genes that are responsible for controlling the development of the body plan are the master genes, a special group of genes (tool kit) of which the Hox genes are the most important. Hox genes are limited in number and are highly conserved, which means that they have not changed much since the beginning of life. They are most active at the embryonic stage of a body. The ordering of Hox genes is the same as the ordering of their expression along a body's axis.

The expression of Hox genes in a body, which is a context beyond the cell in which they reside, points to some encoding, or memory, of a bigger whole of which they could have been part in a previous 'existence'. Hox type genes could be a consequence of the segmented Pattern cell (see P05:10).

"The discovery that the same sets of genes control the formation and pattern of body regions and body parts with similar functions (but very different designs) in insects, vertebrates, and other animals has forced a complete rethinking of animal history, the origins of structures, and the nature of diversity."

(From *Endless forms, Most Beautiful*, p71, by Sean B. Carroll published by Wiedenfeld & Nicholson, 2005.)

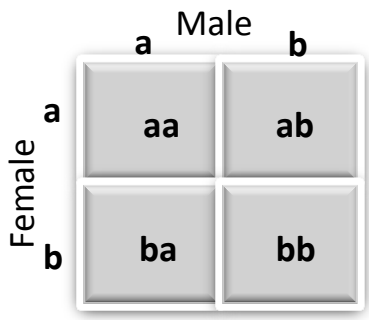
The Pattern Cell Generation

Pattern cells form daughter cells for a next generation and these differ from the parent's cells, possibly to equip the new generation with different capabilities to survive in a different environment.

The Conducting Corpus (Cell Type: Family Cell)

Families are created through procreation by the seed formed by a body (*corpus*). Seeds are the products of a cell division that is called meiosis. Meiosis packages the genetic material of a body inside an egg or a sperm in anticipation of the creation of a new generation.

The characteristics (traits) of the new generation are formed according to hereditary laws. Gregor Mendel was the first to discover these laws by studying the pattern in the traits appearing in the offspring of peas. This pattern is the same as the Pattern (equation) of the Pattern Cube and forms the basis of the Punnett square, a matrix devised by RC Punnett to depict inheritance ratios. The law of heredity that is used here is also the Pattern law (see *The Creation's Pattern* in thepatternbook.com).



The Pattern equation pair: (a + b) = c & c = (b + a)
The Punnett square represents the Pattern equation pair product: (a + b)x(b + a) = aa + ab + ba + bb
The Punnett square also represents a squared Pattern equation: $(a + b)^2 = aa + ab + ba + bb$
The Pattern equation pair could represent an original male-female duonity: (male) = c & c = (female)

The cells of the Punnett square are filled with the possible combinations of specific genetic information from the mother and the father. In the case of a monohybrid cross each parent has the same trait **ab**, where '**a'** indicates the 'dominance' and **b** indicates the 'recessiveness' of the trait. The dominant trait will mask the recessive trait. 75% of the offspring (**aa**, **ab**, **ba**), therefore, will have the trait represented by **a**. The ratio is, therefore, typically 3:1 for the case with only one hybrid cross.

The *Jacob's Tree* example in the duonity.com website shows Jacob and his next generation of twelve sons. Jacob's uniquely male Y-chromosome determined certain sex-related traits in the next generation of sons. The role of Jacob as the 'conducting corpus' extended also to his role as the head of his family.

The Conducting Corporate (Cell Type: Earth Cell)

The conducting corporate is the next level of control. God himself established the conducting corporate in Genesis 1:28. *Then God blessed them, and said to them, "Be fruitful and multiply; fill the earth and subdue it; have dominion over the fish of the sea, over the birds of the air, and over every living thing that moves on the earth."*

After the Fall (see Genesis 3), the family (then a corporate mankind) forfeited their God-given conducting role of the earth. This observation is based on their expulsion from the Garden of Eden.

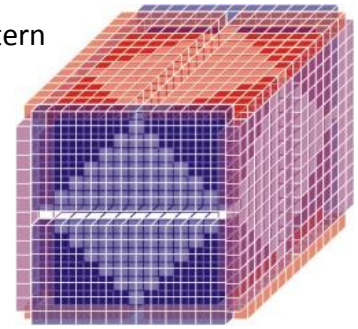
The earth cell idea is an extension of the Gaia hypothesis which proposes that living organisms interact with their inorganic surroundings on Earth to form a synergistic and self-regulating complex system.

The Segmented Pattern Cell

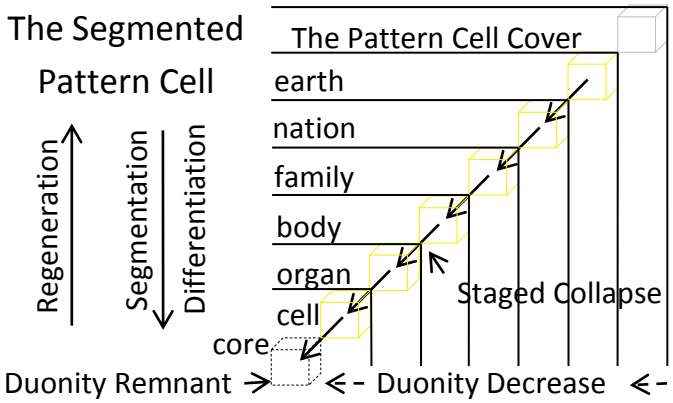
The segmented Pattern cell is derived from the Pattern Cube with its seven concentric cubes. The cell's segments (concentric cubes) could have been formed by a staged collapse process (crystallization) of an original duonity earth cell.

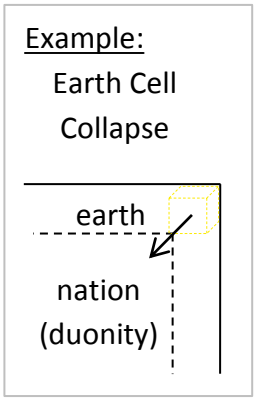
The segments of the Pattern cell could be illustrated by an analogy with concentric strips marked on a Mobius band. The strips of the band could be separated by cutting the band across and lengthwise along the markings. The band would 'collapse' progressively to leave a core duonity strip (if that is not also cut across). The cut strips are in a disduonity state while the core strip remains in the (original) duonity state.

The Pattern Cell



The segmented cells types are, earth cell, nation cell, family cell, body cell, organ cell, basic cell. The staged collapse of the original cell that yields six segments (the concentric cubes) is shown below.





The diagram shows the original earth cell that collapsed in stages until only the duonity core remained.
The individual cell types collapsed progressively as shown by the arrows.

The determination and differentiation of a living cell could be viewed as an encoding process that crystallizes the original, undifferentiated substance of the cell into segments. The earth cell's original duonity content became expressed (decoded), analogously, as segments owing to the staged collapse.

A collapsed cell could be compared to an encoded seed. The seed would grow (be decoded), for example, by a re-duonity (restored duonity) process to yield a new body. The regenerated bodies will, however, collapse again and again because the overall trend is that of entropy. Entropy is a measure of fragmentation. Organisms are, therefore, temporary islands of regeneration in a sea of decomposition.

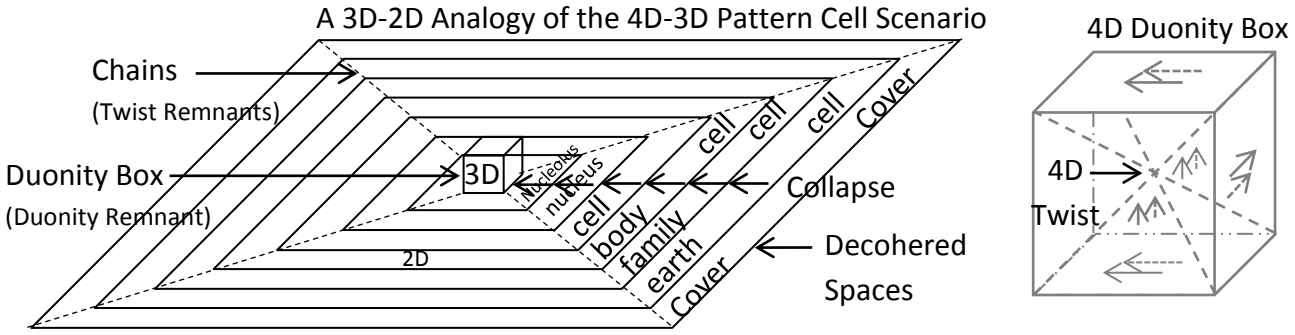
Life in the original earth was likely a kind of womb-life, i.e. composed, cycled and contained (coded, circuited and completed). The strange properties of the quantum world are perhaps the closest we can come to know about life in the original, higher-dimensional duonity creation. The duonity remnant in the core of a cell could be compared to an atom-like quantum object (see P05:11).

Note that the Pattern cell generally refers to the collapsed Pattern cell, the cell with both an Outer and an Inner layer. The segmented Pattern cell, however, is like the Pattern Cube with only an Outer layer.

"Which came first, the chicken or the egg?" The duonity answer to this question is "Both".
(In their higher-dimensional duonity state the chicken is in the egg and the egg is in the chicken.)
The disduonity answer to the question is that the egg is the collapsed (encoded) chicken.

The Quantum Pattern Cell

The properties of the segmented Pattern cell with its duonity core, which is described in P05:10 resemble certain quantum phenomena. The 3D-2D analogy below represents the segmented Pattern cell's 4D-3D staged collapse. The (2D) concentric squares represent the concentric cubes of the collapsed Pattern cell. The duonity box in the centre is a remnant the original higher-dimensional cell.



A **duonity box** is a duonity object that consists of three orthogonal duonity bands that yield a configuration one dimension higher than its environment. The 4D duonity box is shown above, right. The six faces of a duonity box are paired, but adjacent faces are unconnected. (See also P05:3)
A **duonity band** is defined as a twisted face pair (opposite faces) of a cube. (A duonity band is a special case of a Mobius band.) A duonity band is in a **superposition**. A disduonity band is an untwisted band.
Measurement collapses a duonity box by extending a lower-dimensional environment inside the box.
A **life-form** is a re-duonity box. It is a restored duonity, a superposition of previously collapsed objects.
Entanglement is the correlation (the sharing of the twist) between duonity objects, e.g. duonity bands.
Nonlocality is a property of duonity objects. **Coherence** is the state of duonity objects.
Decoherence is caused by the collapse of a duonity object into a disduonity state.

Crossings

A helix type configuration could be seen as being a higher-dimensional [3D] crossing if compared to its compressed X-like 2D crossing. Analogously, the (3D) chromosome pair could, therefore, represent a collapsed 4D twist (like the twist inside the duonity box).

Some curious crossings that are found in the bodies of animals and humans could support the idea of an original higher-dimensional twist that had collapsed. For example, the eyes-to-brain crossing, the lungs-to-body crossing of blood (through the heart) and the brain-to-body crossing (left brain controls right part of body and vice versa) could all point to collapsed versions of an original higher-dimensional twist.

The core (the crossing) of the segmented Pattern cell, the duonity box, remains in a higher-dimensional state. It appears to be atom-like, something in a duonity state that exhibits quantum properties as shown above. The quantum nature of elementary particles was dealt with in the *GSM* (see Folder 4).

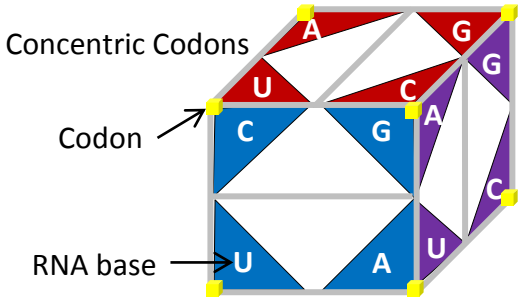
(The node-like nature of the 'twisted' Pattern Cube is explained in some detail in Folder 2, *The Pattern Energy*. The Light-cones of the Pattern Cube are shown to be standing wave node cones.)

Note that the virtual clefts of the Pattern cell are not, as yet, associated with some component or function of a living cell. Further research may well reveal such an association.

"…because the truth always turns out to be simpler than you thought." Richard Feynman

The Geometric Genetic Code

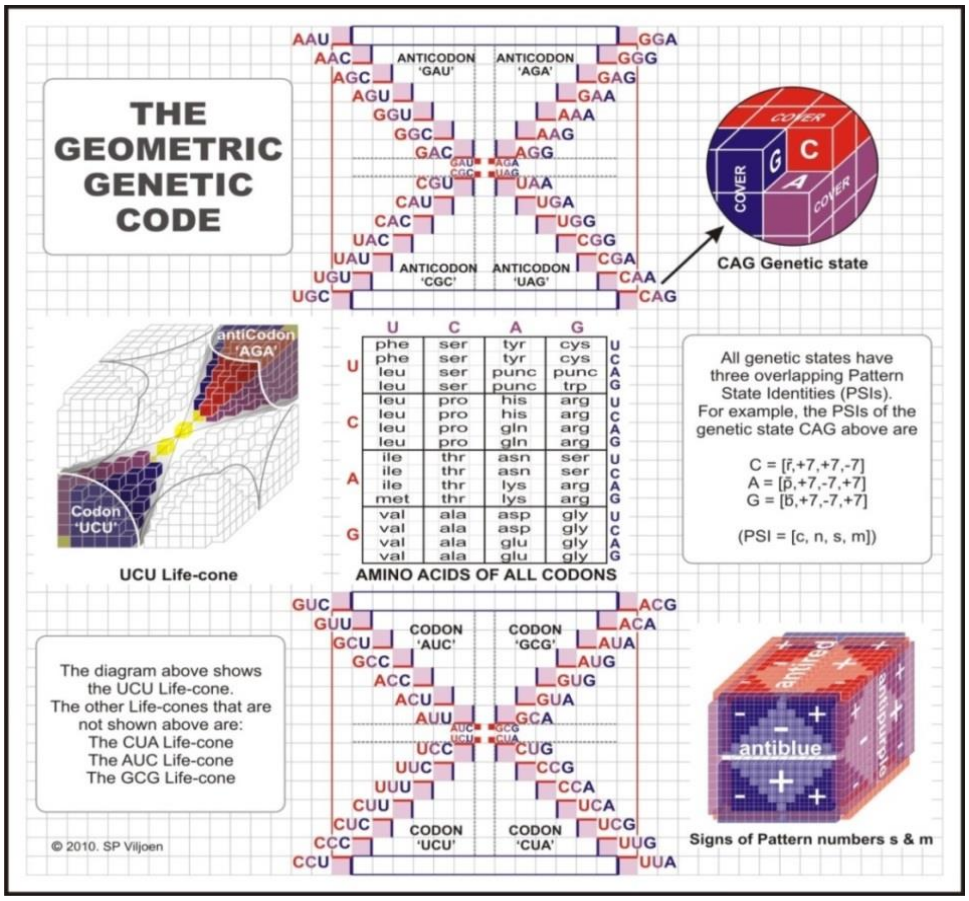
The virtual links of the segmented Pattern cell's chains represent the codons (triplets) of the genetic code, an alphabet of 64 letters, eight chains with eight codons each. Each codon is defined by the three differently-coloured corner plates 'touching' it. The plates of the cell's concentric cubes represent RNA bases. One codon set with its bases is shown below. (Each set of eight codons form one code word.)



The genetic code seems to be a kind of precipitation, or crystallization, of the original all-inclusive earth cell (see P05:10). According to this idea each step of the collapse contributed eight different codons, one codon to each one of the eight code chains that stretch from the core to the vertices of the Pattern cell.

The Geometric Genetic Code map below is from *The Pattern of All Things* in thepatternbook.com.

The genetic code is the alphabet of life.



"Was the genetic code perhaps also the first chromosome pair?

(The two end codons (in the aa-covers) of each genetic code chain are not defined by ab/ba plates as are the other codons. They do not, however, code for unique amino acids and could, therefore, be ignored.)

The codon sets of the genetic code match the stages of collapse of an original earth cell. The genetic code could, therefore, represent an early record, or history, of the universe. This idea is not dissimilar to archaeogenetics where evidence of mutations contained in DNA is used to reconstruct human history.

The Pattern Cell folder completes the three folders (Folder 3, Folder 4 and Folder 5) of *The Encoded Earth* book. *The Encoded Earth* hypothesizes that the current earth is the seed of an original living earth. The Pattern cell as described in Folder 5 is a model of the seed which is the encoded earth.