More questions than answers

by Karin Mont

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Synergy happens when separate elements combine and collaborate, creating a potentially powerful new force or entity, which is greater than the individual parts could ever be if they were taken in isolation. The sum is, and always will be, greater than the parts – this is the essence of holism, and we see it at work in numerous different guises, throughout the living world. The field of scientific inquiry is evolving at a speed unimaginable just half a century ago, and the instruments now used to explore, view, measure and monitor life on earth are highly sophisticated, often relying on artificial intelligence (AI) for precision targeting, or to analyse reams of data accurately and quickly. This means that we are discovering new and sometimes quite extraordinary facts on almost a daily basis. Obviously, it's good to expand and extend our knowledge base whenever possible, but there is one small problem: Because we have suddenly found out more about a particular process, we tend to think we know everything about it, and fail to fully consider all the elements of which, as yet, we know very little. In fact, we're not very good at admitting what we don't know. Once a new discovery has been acknowledged, accepted, and a level of basic understanding has been reached, there is a tendency within the scientific community, to look for ways to monetise that discovery, before we properly address our knowledge gaps.

There is an assumption that we have an absolute right to use emerging scientific knowledge to increase our control over natural processes, and the field of medical science in particular provides rich pickings. Past mistakes are all too frequently either overlooked, or covered-up and dismissed altogether. We find it hard to acknowledge that the more we know, the more we know we need to know, and if we don't know the answer to a question, we just ignore the question! For example, most pharmaceutical products work by manipulating and controlling natural processes which have taken millions of years to evolve. The basis upon which modern medicinal drugs are developed is to remove the faulty 'part' from the 'whole', and force it to deviate from its original course. It is an approach that may be life-saving in emergency situations, and it can result in the rapid relief of predominant symptoms, which makes it popular with patients – after all, who wants to put up with unpleasant symptoms if popping a pill will fix it? However, as we know, the long-term use of any pharmaceutical product may well result in negative, often unforeseen consequences. This is what happens when partially understood phenomena are viewed in isolation, instead of being recognised as diverse components of a highly complex whole.

The discovery in 1953, by James Watson and Francis Crick, of life's most crucial building block, deoxyribonucleic acid (DNA), was a ground-breaking event which precipitated molecular biology into a new and exciting era. As greater understanding of the structure and function of DNA evolved, the possibility of altering basic genetic coding in order to modify a living organism became apparent, and the process of gene editing was born. Initially, this gave rise to ethical concerns, in case the technologies developed to undertake gene editing might be used to create 'designer babies' in the future. However, the commercial potential of gene editing food to increase yield, size, disease-resistance, and other apparently desirable characteristics, swiftly overcame the ethical issues, and the biotech industry were free to take genetic modification to a new level.

Currently, an ever-increasing amount of the food products we consume originate from crops that have been genetically modified by gene editing, a series of processes used to develop a particular 'desirable' trait. However, as we don't yet fully understand the bigger picture, there is a risk of introducing unintended, or even harmful, traits through gene editing, and that risk increases with every edit. This means that when multiple genes are targeted (as opposed to just one single gene), the likelihood of multiple errors occurring is highly likely. This is a well-known fact, and one which is of major concern to researchers. There is another problem; new gene-editing technologies give researchers access to parts of the genome normally protected against mutations, which means that, when an edit goes wrong, it can negatively impact upon a different, even vital, function.

Our ability to manipulate genes has given rise to a whole new area of research, loaded with commercial potential. One such possibility is the development of new 'precision' medicines, which can be used to treat humans for just about any condition. In fact, over the last two and a half years, we've witnessed the largest experimental medical trial ever undertaken; the roll-out of the 'jab', a so-called vaccine which uses a gene-edited substance as its active pharmaceutical ingredient. We know that things haven't gone according to plan, and we know that some things have gone badly wrong, but we have yet to learn the full extent of the damage.

What we do know is that we took our 'partial' knowledge of the form and function of DNA out of the context of the greater whole, and we manipulated it into doing something it wasn't naturally primed to do. Simply put, the jabs hijack our cells, and turn them into a virus-creating factory – we have succeeded in tricking our own genome, which is normally programmed to protect us, to turn against us. This is a highly risky strategy. Research focussed on the alteration and control of our genes is almost exclusively funded by biotech and the pharmaceutical industry, who stand to reap rich rewards for each new innovation which can be turned into a patented seed, or a marketable medicine. By contrast, little or no effort seems to be focused on identifying the conditions needed to optimise effective DNA functionality. There are no profits to be made from supporting or enhancing a natural process.

Another 'part' which plays a significant role in regulating the 'whole' of us healthwise, is our microbiome. We only started to appreciate its importance in the late 1990s and, as with the discovery of DNA, the more we find out, the more we begin to recognise its complexity. We know we have a lot of microbes which live on or inside of us, and they comprise bacteria, fungi, protozoa and viruses. The microbiome is the genetic material of all these different microbes, which outnumber our regular human cells by an estimated ten to one. Theoretically, this makes us more microbe than human!

Apart from helping us to digest our food, the microbiome is involved with our development, regulates our immune system (in synergy with our DNA), protects us against disease-carrying bacteria, produces vitamins such at vitamin B12, thiamine, riboflavin, and vitamin K, which is essential for blood coagulation. We also know that the gut microbiome exerts a powerful influence on human neurophysiology and mental health because the brain and the gastro-intestinal tract are intimately connected. Dysfunction of the microbiome can be the product of mental or emotional distress and, conversely, mental / emotional stress can be the cause dysfunctionality of the microbiome. This fact has significant implications because a defective microbiome is associated with a number of autoimmune diseases, such as diabetes, rheumatoid arthritis, muscular dystrophy, multiple sclerosis and fibromyalgia. Interestingly, a pre-disposition to autoimmune disease appears to be passed to the next generation via the microbiome, not via DNA inheritance. Mapping the human microbiome is an ongoing process, which has so far led to the identification of new species of microbes, so therefore new genes. Generally speaking, researchers studying the microbiome acknowledge its intricacies, and admit they don't really understand how an individual's specific microbiome is established in the first place. We know that antibiotics frequently have a negative impact upon the microbiome, but it is less clear if the microbiome might have a negative impact upon some medication, either by rendering it less effective, or by enhancing the likelihood of an adverse reaction occurring. One thing is abundantly clear: a healthy microbiome is good news for our overall health, so we need to focus on supporting the function of the microbiome, through using natural approaches wherever possible.

There is (at least) one other entity that plays a vital role in ensuring functionality within all living organisms: the electrome. Unlike DNA or the microbiome, the electrome has no physical mass – it is literally immaterial, but the energy it produces via electricity powers, regulates, directs and controls every process essential to life itself. In short, the electrome is the electricity which courses through the 40 trillion cells in our body, and transmits those encoded instructions which govern every life process within us. We've known about the existence of 'bodily battery power' (now more appropriately referred to as 'bioelectricity') for over 200 years. In the late 1780s, Luigi Galvani conducted a series of experiments where he demonstrated that applying an electrical connection to a nerve in the leg of a specially 'prepared' frog specimen could stimulate an observable physical reaction, such as to make the leg twitch. Electricity was the medium necessary to carry and connect the messaging, which resulted in the leg's unmistakable reaction. Since those early experiments, we have learned that all our cells act as mini-batteries, which emit ion-driven micro voltages, all of which are measurable. Now here lies the problem: If something is measurable, it can also be altered and manipulated, in a manner similar to what happens to DNA, when it is subjected to gene-editing.

Experiments involving the alteration of the natural form and function of the electrome have already taken place, resulting (for example) in the creation of a frog with eyes located in its stomach, and a two-headed worm. As grotesque as these aberrations may seem, they pale into insignificance when compared to how artificially-induced changes to the electrome can affect or alter normal human behaviour. In America, the Defense Advanced Research Projects Agency (DARPA) have been exploring how best to harness the cellular battery power present within all of us, and convert it into a military advantage. This can be achieved by fine-tuning a soldier's brain with carefully targeted electrical surges, using a process known as transcranial direct-current stimulation (tDCS), so they become a more effective and efficient killing-machine. The process is supposed to result in mind-enhancement, but the ethical considerations this field of study opens up are massive. If we add to that the fact that we still know very little about the electrome's relationship with (for example) our DNA, and our microbiome, we can see the potential for these experiments to go disastrously wrong.

There is another side to our evolving understanding of the form and function of the electrome, and this 'other side' is both mind-blowing and life-affirming, in equal measure. A recent article published in the *New Scientist* (25 February 2023), described the remarkable observations made recently by the experimental biologist Dany Spencer Adams. She was studying ion-channel dependent signalling (a process which takes place within the electrome) in vivo, using frog embryos as her subject matter. She was videoing the development of the frog embryo using a specialised photographic technique. When she checked the video she saw the following:

> **The frog embryo busily dividing to become a tadpole. Then, this tiny smooth blob began to light up. Electrical patterns flashed a series of unmistakable images across it: two ears, two eyes, jaws, a nose. These ghostly projections didn't last long. But two or three hours later, exactly where they had glimmered, the real things appeared: two ears, two eyes, jaws, a nose.**

This extraordinary observation confirmed a theory which Dany Adams (and others) had been working on for the last decade; **that the blueprint which determines the shape and form of our physical body is created by a series of carefully coordinated electrical patterns**.

Shaping the developing organism is just one of the many roles that electricity plays in biology. We still have a lot to learn about the science of bioelectricity, the microbiome and our DNA and, at the moment, there are a lot more questions than answers. In all probability it is unlikely that we will ever fully understand how all these highly complex entities which oversee essential life-processes, interrelate. However, we do know that they are pre-programmed to harmonise and synchronise their actions, in order to create and maintain a healthy state. To 'tinker' with the functionality of one life-process influencer, without fully understanding the impact that might have upon the whole, is a high-risk strategy, and that stark fact needs to be properly acknowledged by the scientific community. □