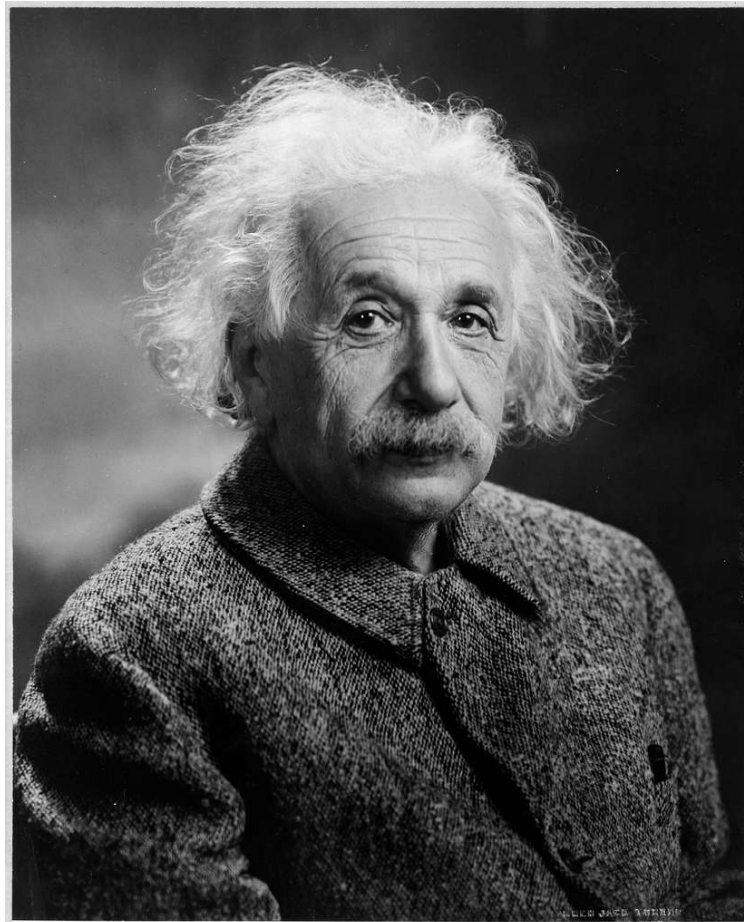


## FEATURE: Frequencies (Part 1) – unearthing the mysteries of life

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*“Future medicine will be the medicine of frequencies.”*



- Albert Einstein

Have you noticed the upsurge of interest in frequency and energy medicine? Have you even been hooked up to a frequency medicine machine of late – or do you know friends or family who have been? Have you wondered which ones have a decent scientific evidence base behind them – and which ones don't appear to?

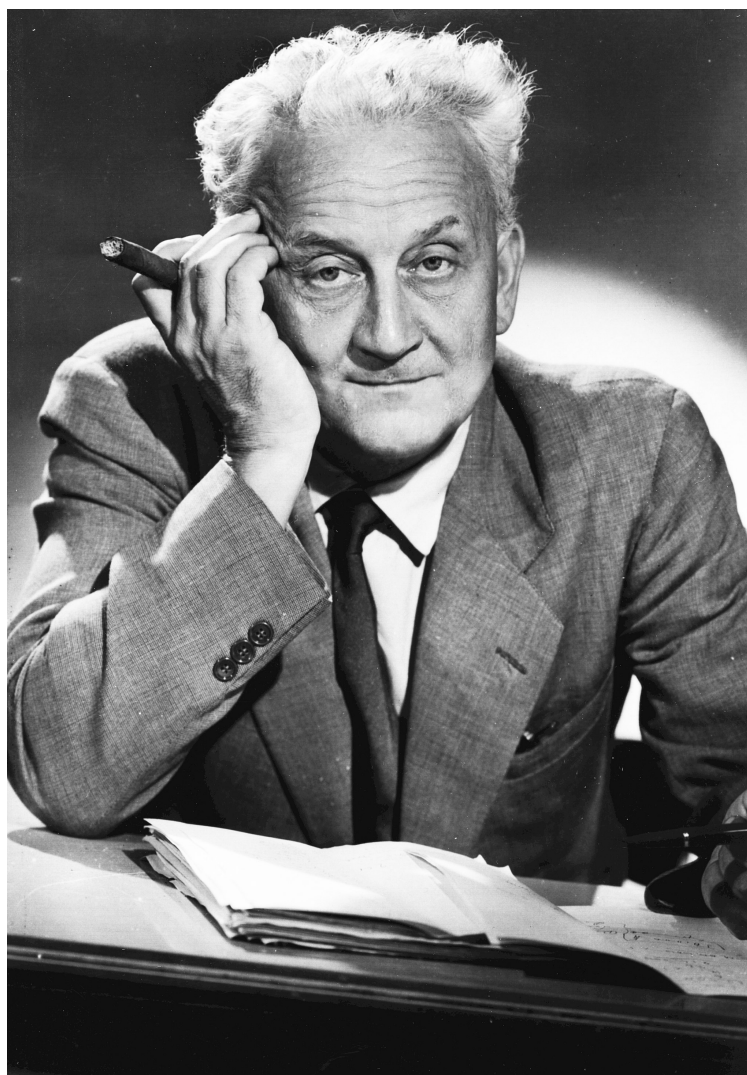
The reality is that frequency medicine is experiencing a renaissance in the wake of the covid-19 pandemic and there is an increasing diversity of technologies being used. Some of it is being foisted on the public, including sectors of those that have been injured by covid-19 vaccines, in an aggressive way, sometimes by way of multi-level marketing enthusiasts with no training or background in the healthcare professions. Others are touted as miracle cures for absolutely any condition.

Could some of these technologies cause harm – and could others represent one of the key missing links in medicine and health care?

In this feature, we take a deeper dive into what's going on in this fascinating and often neglected area of medicine, and we hope it might go some way to helping you sort the (gluten-free) wheat from the chaff.

*“How does energy control life? We don't know that. We often even forget to ask such questions blinded by our successes.”*

- Albert Szent-Györgyi



## Einstein's vision of medicine

Considering it is now nearly 120 years ago that Einstein proposed the theory of mass-energy equivalence encompassed by his general theory of relativity and the world's most famous equation


([https://www.academia.edu/40118789/E\\_mc2\\_A\\_Biography\\_of\\_the\\_Worlds\\_Most\\_Famous\\_Equation\\_by\\_David\\_Bodanis](https://www.academia.edu/40118789/E_mc2_A_Biography_of_the_Worlds_Most_Famous_Equation_by_David_Bodanis)),  $E = mc^2$ , many would argue, us included, that it is remarkable that energy medicine has not by now become the mainstay of medicine as predicted by Einstein himself.

So why is today's mainstream system of medicine not the medicine of frequencies? Is it because the science of energy medicine

hasn't progressed sufficiently, or is it because the scientific basis of energy medicine isn't recognised, or because it hasn't been demonstrated to be clinically effective, at least consistently enough?

It's certainly true that the science hasn't progressed as much as the likes of Einstein, Nikola Tesla

(<https://www.biographyonline.net/scientists/nikola-tesla.html>), **Albert Abrams** (<https://subtle.energy/albert-abrams-radionics-technology/>), **Royal Raymond Rife** (<http://www.royal-rife.com/>) and **Fritz-Albert Popp** (<https://www.iumab.org/prof-fritz-albert-popp/>), who were among the pioneers (see Box below) in the emerging field of bioenergetics in the early twentieth century, might have anticipated.

SELECTED PIONEERS OF FREQUENCY MEDICINE	
	<p><b>Albert Abrams (1863 – 1924)</b></p> <p>After returning home to California with a medical doctorate from the University of Heidelberg and being appointed as professor of pathology at Cooper Medical College, San Francisco, California, Dr Abrams developed machines that helped him to discover that different diseases caused tissues to resonate at different frequencies. Among his pioneering machines were the Reflexophone and Oscilloblast. He claimed that that by reflecting back healthy frequency signals he could cure a wide range of diseases. He referred to the mechanism as ERA (Electronic Reactions of Abrams). He was increasingly discredited and claimed to be a fraud by the medical establishment which was threatened by his findings, often on the basis of spurious evidence. His technology was picked up in the 1950s by Dr Ruth Drown, who renamed it 'radionics', and it was and continues to be used to a limited extent with some claims of success in agriculture, as well as in human health.</p> <p><i>Find out more <b>here</b></i> (<a href="https://subtle.energy/albert-abrams-radionics-technology/">https://subtle.energy/albert-abrams-radionics-technology/</a>). (<a href="https://subtle.energy/albert-abrams-radionics-technology/">https://subtle.energy/albert-abrams-radionics-technology/</a>)</p>



### **Royal Raymond Rife (1888 - 1971)**

Raymond Rife was an American inventor and early exponent of high magnification microscopy including cinemicrography with magnifications exceeding 17,000 times. He was able to view bacteria and viruses with these dark-field Rife microscopes and went on to develop 'beam ray' generators that were claimed to selectively weaken or destroy pathogens, both in laboratory settings and clinically. He developed a particular interest in cancer mediated by such pathogens and subsequently faced the ire of the American Medical Association who tried to discredit him for his claims. His ideas were picked up following the publication of Barry Lyne's 1987 book, *The Cancer Cure That Worked*. This led to the development of a wide variety of so-called Rife 'frequency generators' that claim to be based on Rife's work, some of which, even recently, have been the subject of health fraud claims initiated against sellers by the FDA and District Courts in the USA.

*Find out more **here** (<http://www.royal-rife.com/>).*



**Dr Reinhold Voll (1909 - 1989)** (image source: <https://www.biologicalmedicineinstitute.com/reinhold-voll>)

A German family doctor who developed an interest in traditional Chinese acupuncture and went on to develop electroacupuncture according to Voll (EAV). The method uses the same meridians as traditional Chinese medicine (TCM) along with additional meridians (that Voll referred to as *vessels*). The EAV method relies on measuring skin resistance (electrodermal activity) using an EAV device that includes a negatively charged electrode held by the patient and a positively charged electrode that is used to make contact with the patient's skin by the EAV practitioner. Nosode tests allow the measurement of the energetic characteristics of different drugs, food and supplements and are claimed to help determine tolerability by the patient. Treatments with EAV are considered to enhance the effects of conventional needle acupuncture.

*Find out more **here** (<https://biontologyarizona.com/dr-reinhard-voll/>).*





### Robert O Becker (1923 - 2008)

An American orthopaedic surgeon and researcher in the field of electro-physiology and electro-medicine who became a pioneer in the field of bioelectricity and bioelectromagnetism, the field that seeks to understand how these forces influence biological processes. Becker was among the first to suggest that electric fields contributed to the healing of wounds and bone fractures. He went on to show that regeneration following bone fractures or amputations could be accelerated by applying electrical potentials to the damaged tissues. He also showed that limb regeneration in amputated limbs of frogs and salamanders were controlled by electromagnetic forces (the animals' biofield). Among his most important contributions was the summation of his and others' work in the field of bioelectricity and bioelectromagnetism in his book, *The Body Electric: Electromagnetism and the Foundation of Life* (1976, 1998, William Morrow, 388 pp). He was among the first to show concern over health risks from high voltage power lines.

*Find out more here.* (<https://robertobecker.net>)



### Fritz-Albert Popp (1938 - 2018) (image source: <https://practitioners.neshealth.com/>)

A German theoretical physicist and pioneering quantum biophysicist and biologist, who was appointed as a professor at Marburg University from 1973 to 1980 and went on to establish the International Institute of Biophysics in Neuss, Germany. During the mid-1970s, Prof Popp picked up research by a Russian embryologist, Alexander Gurwitsch, who in 1922 was the first to discover the existence of ultra-weak light emissions in living cells (from onion roots) that he referred to as *mitogenic radiation*. Popp went on to find these ultra-weak light emissions occurred in all living systems and renamed them *biophotons*. Over many years he developed his biophoton theory of life that proposes that coherent light emissions functioning in the quantum plane are the primary controllers of biochemical and molecular processes. The work of Popp's research group found that a cell's DNA was the most important source of biophotonic emission. Popp went on to consider the connection between the cell radiation and consciousness.

*Find out more here*

(<https://www.teravanza.com/documentacion/popp%201.pdf>).

Thanks in large part to the engineers, biophysicists and quantum biologists who pioneered the emerging field of frequency medicine (see box above), most of whom were ridiculed, ostracised or dismissed during their lives or posthumously, there is now an increasing understanding within the scientific community that plausible explanations of life must diverge from the prevailing biochemical, molecular, genetic and Newtonian-Cartesian concepts.

Any exploration that seeks to find better or more complete explanations for life lead one to the field of biophysics – itself a discipline

of huge diversity, about which there is still little general consensus ([https://www.academia.edu/13658751/Introduction\\_to\\_Integrative\\_Biophysics](https://www.academia.edu/13658751/Introduction_to_Integrative_Biophysics)). It's the findings from this rapidly emerging discipline that consistently reveal that the much studied biochemical and molecular processes in all living systems are entirely dependent on electrical and electromagnetic energies, that have been much less well researched. But this is exactly what one might expect from Einstein's general theory of relativity, given the interchangeability of energy and matter.

## You discover what you look for, and remain ignorant of what you ignore

What has slowed progress in our understanding of these complex interactions between energy and matter is the paucity of research in the application of biophysics and quantum biology to medicine. The result has been a corresponding lack of any cohesive and generally accepted body of evidence demonstrating the mechanisms, or the benefits, of medical or health-related technologies that work with the energy systems of the body.

This, in our view, is entirely down to the lack of concerted research effort and funding for energy medicine – as well as the way scientific communication is controlled by the academic and public-facing media.

Why the whitewash?

Nearly all of mainstream research efforts on the body's non-molecular based energy systems (i.e. energy that's not related to the body's biochemical fuel) have been expended on developing specific diagnostic technologies. By contrast, there's been almost no prioritisation of research by major research institutions that aims to explore how different ways of working with the body's energy fields might be able to benefit the treatment of disease – or indeed prevent disease.

Accordingly, with very few exceptions, in very few countries (notably Germany, Austria, Switzerland and Russia), mainstream treatment of disease almost entirely excludes consideration of the body's electromagnetic energy system (biofield).

## We know it's there, but we choose not to see it

By comparison, diagnostics that depend on these energy systems can be found in every hospital. Take, for example, electrocardiographic recordings of the heart's pulse in electrocardiograms (ECGs) and for assessing heart rate variability (HRV), readings from electroencephalograms (EEGs), magnetoencephalography (MEG) of the brain, magnetoneurography of peripheral nerves, or the now very familiar and much-used magnetic resonance imaging (MRI). These diagnostic techniques all exploit the body's bioelectromagnetic system.

It seems that the most viable reason for why this crucial system has been so neglected in terms of its use for treatment is down to the pharmaceutical industry's purposeful anchoring of treatment modalities in the areas of biochemistry and, more recently molecular biology. This limitation has almost certainly been driven by Big Pharma's desire to stick with its business with disease (<https://www.bmj.com/content/324/7342/886.1>) model that has been based heavily on 'medicalising' different states of health while creating extremely lucrative patents for new-to-nature molecules, justified by biochemical, molecular or genetic mechanisms.

The notion that energy, that may be described as *chi* or *prana*, flows throughout and around the body through a biofield network that may be viewed as auras, or interconnected via meridians or chakras, is viewed by most mainstream doctors and health scientists as being too woo-woo to be taken seriously by mainstream medics (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4654786/>). Despite these systems having been recognised for thousands of years.

Modalities like acupuncture, acupressure, reflexology, homeopathy, Reiki, Qigong, distance healing, flower remedies, magnet therapy, phototherapy (to name a few), as well as a diverse range of frequency medicine machines, all work with the human energetic biofield (<https://www.liebertpub.com/doi/10.1089/10755530260511711>). However, they continue to be largely consigned to the fringe worlds of traditional systems of medicine, such as traditional Chinese medicine (TCM) or Ayurveda, or alternative medicine.

Each year, much effort is expended by proponents and defendants of the pharmaceutical model, as witnessed by content on websites such as Science-Based Medicine ([https://sciencebasedmedicine.org/?s=energy+medicine&category\\_name=&submit=Search](https://sciencebasedmedicine.org/?s=energy+medicine&category_name=&submit=Search)) and Quackwatch ([https://quackwatch.org/?s&\\_sf\\_s=energy+medicine](https://quackwatch.org/?s&_sf_s=energy+medicine)), to ensure such modalities are viewed as pseudoscience or quackery.

This might keep those who are wedded and trusting of the mainstream medical model away – but the millions who are open to energy medicine continue to use elements of it based mainly on their own positive experiences with it. Others appreciate there is a very long history of safe use of different energy medicine modalities and that the science is only recently starting to emerge.

At the heart of the attacks on energy medicine are claims that these modalities lack a plausible or known mechanism of action. Many fail to recognise that these proponents, as the great Greek philosopher Socrates alluded, don't know what they don't know. We could take it one step further, even; they choose not to investigate what they don't know – especially when it comes to the field of bioenergy medicine.

## Frequencies are fundamental to all living systems

Frequencies are vibrations or oscillations of energy. Energy can be transferred in a variety of ways, principally in electrical, electrochemical or electromagnetic forms.

Let's start at the beginning.

**Electricity** runs whole cities and factories and provides the energy for lighting and powering most people's homes. But it also exists in nature, both within and without living systems. It is, in essence, the flow of electromagnetic energy through negatively charged sub-atomic particles (<https://health.howstuffworks.com/human-body/systems/nervous-system/human-body-make-electricity.htm>), called *electrons*, along a conductor, such as a nerve fibre or a copper wire. Electricity exists in every living being. Our hearts wouldn't pump, our brains wouldn't work, and our nerves wouldn't fire without it. But electricity also exists in nature outside living systems, such as in the form of lightning.

Electricity – or this electromagnetic energy flow involving negatively charged electrons – can also induce chemical changes. The scientific field that studies the interconversion of chemical and electrical energy is called **electrochemistry** and our bodies rely on electrochemical gradients every time a nerve impulse is transmitted. These nerve impulses vary in speed from rates (<https://hypertextbook.com/facts/2002/DavidParizh.shtml>) of less than 1 metre per second for a pain signal, through to over 100 metres per second (<https://hypertextbook.com/facts/2002/DavidParizh.shtml>) when we activate muscle fibres. This is much slower than the flow of electricity in a copper wire in a typical domestic residence (typically around 200 million metres per second, around 90% of the speed of light). While we know this happens (<https://health.howstuffworks.com/human-body/systems/nervous-system/human-body-make-electricity.htm>) through the changes in membrane potential that occur through polarisation and depolarisation of nerve fibres caused by the influx and efflux of positively charged sodium, potassium or calcium ions via voltage-gated ion channels, there may be other mechanisms at work as well. This includes the possibility (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7862265/>) that biophotons (particles of light energy emitted by all living organisms) trigger such reactions and act as quantum controllers of life. More on this later.

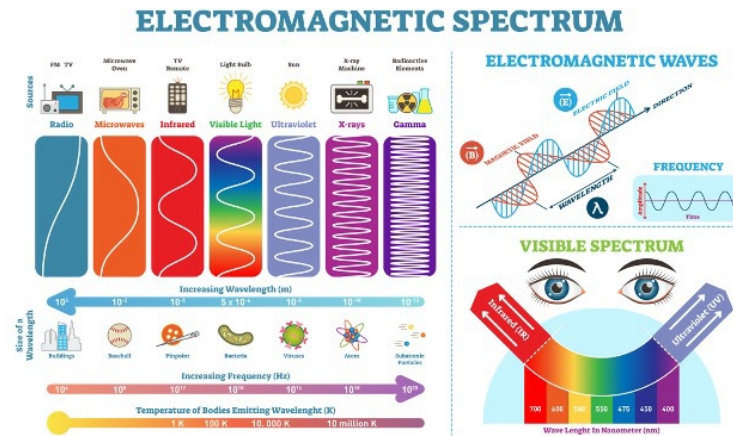
**Electromagnetism** is a type of energetic force that acts between charged particles that is a combination of both electrical and magnetic forces (<https://byjus.com/physics/electromagnetism/>). Electromagnetic waves, unlike sound waves, can travel through a vacuum (including space) because they are massless. Electromagnetism has been exploited in a wide range of technologies, from the creation of the loudspeaker, induction hobs, through to radio, television and wireless radiation, and in x-ray machines.

**Electromagnetic waves** are propagated by oscillating electric and magnetic waves at right angles to each other (see Fig. 1 below). Many will be familiar with some of their properties, such as interference (e.g. of radio or television signals) and diffraction (e.g. when you see the rainbow colours in a crystal or on the surface of a CD).

Key features of electromagnetic waves are the wavelength, which is the distance between wave peaks (measured in nanometres, metres or even kilometres), the amplitude (height) of wave, generally related to power and measured in Gauss units, and frequency i.e. the number of waves (cycles) that pass a given point per second, measured in cycles per second using the Hertz (Hz) unit, where 1 Hz = 1 cycle per second.

As you'll see in the figure below, visible light is a form of electromagnetic wave. The speed of light (nearly 300 million metres per second) is faster than anything we know of in the universe – because a light wave, like any electromagnetic wave, is itself massless.

Electricity, by contrast involves the transfer of electromagnetic forces between sub-atomic electrons that are particles with mass, albeit miniscule. In the copper wiring of a house, the electricity wave might move at around two-thirds this speed, say 200 million metres per second. The electrons themselves actually move very slowly, as well as in multiple directions, colliding with each other, generating the familiar heat associated with electricity in a wire. The average net speed of movement, taking into account collisions and the backwards and forward movements in AC electrical systems as developed by Tesla, result in typical electron drift velocities of considerably less than 1 millimetre per second in the copper wire of your household electrical system.



**Figure 1. Left:** The electromagnetic spectrum – from radio waves to ionising (radioactive) gamma waves.

**Top right:** In the case of electromagnetic waves, electric (*E*) and magnetic fields (*B*) run perpendicular to each other, and to the direction of the wave vector. The wavelength ( $\lambda$ ) is the distance between wave peaks and the frequency refers to the number of wave peaks transmitted per second (1 Hertz per second = 1 wave peak (cycle) per second).

**Bottom right:** the visible light spectrum (400-700 nm).

## Music to your ears

To help avoid any confusion, while sound can be measured as a frequency because it involves the vibration of particles of matter, it is not a form of electromagnetism, in contrast to light and electricity which, as we've discussed, are.

That's why we can see light through space, yet space is silent to the human ear as there are no particles to vibrate. That's not to say that sound and its resonances, including music, cannot be beneficial in healing. In fact there's a great deal of experimental and clinical evidence to suggest particular resonances that are both heard through the ears – and heard by vibration receptors within the body – can be highly beneficial. This explains in part at least why the human love of music is so universal and why animals are so reliant on different sounds, not just to communicate, but to also improve their quality of life.

The human ear in a healthy, young person can typically detect sound at frequencies of between 64 and 23,000 Hz ([https://www.researchgate.net/figure/The-approximate-hearing-ranges-of-24-animals-using-data-extracted-from\\_fig29\\_267625336](https://www.researchgate.net/figure/The-approximate-hearing-ranges-of-24-animals-using-data-extracted-from_fig29_267625336)). But we can feel 'sub-sonic' sounds at and below 20 Hz, at the very bottom end of the frequency range of some of the best, commercial subwoofer speakers. By comparison, the audible range of a bat is between 7,000 and an astounding 200,000 Hz (<http://gbssalotea.blogspot.com/2018/03/can-you-hear-that-summary.html>).

## 'Essential' electromagnetic fields (EMFs)

Now to the nub of what frequency medicine is all about (as distinct from sound healing). Electromagnetism, just like electricity, is fundamental to all living systems. But here's the thing: it increasingly appears from emerging science and the most viable theories that attempt to explain life (such as those contained in reviews here (<https://www.tandfonline.com/doi/abs/10.3109/15368379809030740>), here (<https://www.tandfonline.com/doi/abs/10.1080/15368378.2016.1194293>) and here (<https://www.extrica.com/article/22787>)), that electromagnetism isn't just a by-product of the function of living systems. It may actually be the form of energy that makes life happen, by causing the composite molecules, atoms and sub-atomic particles of living systems to move in ways that allow us to describe the organismal matter we see and sense as a living being.

Non-coherent patterns of electromagnetic energy – ones that are affected by, say, interference – may also be drivers of dysfunction and so may be associated with disease or even death. Simply understanding the importance of electromagnetism in living systems should be reason enough to question the ever greater reliance humans have on wireless information and communication systems and the electrosmog they create. These technologies expose us (and other animals, plants and microbes) to novel frequencies as well as amounts (doses) of low frequency EMF radiation that are increasingly way in excess of background thresholds (<https://www.hilarispublisher.com/open-access/electromagnetic-fields-and-life-2332-0796-3-119.pdf>) experienced during the course of the evolution of life on Earth. 5G rollout in the absence of safety testing and a transition towards the so-called Internet of Things (<https://link.springer.com/article/10.1186/s40537-019-0268-2>) (IoT) must be regarded as probably the largest uncontrolled experiment ([/news/the-5g-disconnect-the-biggest-next-gen-uncontrolled-experiment/](https://news.the-5g-disconnect-the-biggest-next-gen-uncontrolled-experiment/)) ever conducted by humans. One that doesn't just affect one species, but potentially all of



life on the planet.

>>> Find out more about harmful EMFs from cell phones, wireless systems, power lines and other sources of low frequency-EMFs in the Bioinitiative Report 2012 (<https://bioinitiative.org/table-of-contents/>) and the British Society for Ecological Medicine conference on 5G and health in 2019 (</news/there-are-no-safety-studies-say-5g-experts/>)

In a world in which the medical profession has yet to come to accept the intimate relationship between electromagnetism and life, the importance of transitioning away from a molecular and biochemical model to one that includes EMFs and the human biofield may be an idea that's something of a horse pill to swallow.

So let's now move on to look at some key pieces of evidence that, once digested, might make the current biochemical and molecular basis of life look (to keep the equine metaphor cantering) blinkered, at the very least (Fig. 2).



**Figure 2.** Mainstream science's blinkered approach to medicine has meant that energetic processes in the body are viewed primarily as being driven by biochemical (including molecular and genetic), electrochemical or bioelectric – but not electromagnetic – processes.

## Why do we think electromagnetism is essential to life?

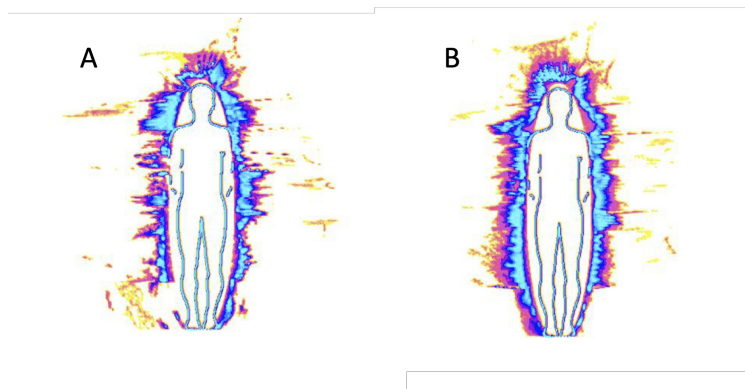
One could write a book about this subject and, indeed, luminaries such as Robert O Becker MD & Gary Selden ([https://www.goodreads.com/book/show/277641.The\\_Body\\_Electric](https://www.goodreads.com/book/show/277641.The_Body_Electric)), James Oschman PhD ([https://www.goodreads.com/book/show/168369.Energy\\_Medicine](https://www.goodreads.com/book/show/168369.Energy_Medicine)) and Donna Eden & David Feinstein PhD (<https://edenenergymedicine.com/product/energy-medicine-10th-anniversary-edition-award-winning-book/>) have done just that. For those interested, we strongly recommend all three of these books.

But I'd like to pull out 6 facts about bioelectromagnetism that I think provide very persuasive evidence for its intrinsic relationship with life.

**1. Every human (and other living organism) has a measurable biofield that can be influenced by energetic systems.**

There is now unequivocal evidence that an energy field (biofield) exists within and outside our bodies. This is logical given the proven existence of bioelectric and bioelectromagnetic forces within the body (see above) – both of which generate electromagnetic fields. The human biofield can be visualised using technologies such as Kirlian electrophotography or its digital successor, gas discharge visualization (GDV) as developed by Dr Konstantin Korotkov (<https://newearth.university/members/dr-konstantin-korotkov/>) following the work of Dr Peter Mandel (<https://www.iumab.org/dr-peter-mandel/>) in Germany. It has long been known that some people have a sense of perception sensitive enough to visualise (<https://www.quora.com/Is-it-true-that-people-can-see-auras-What-do-they-mean>) the biofield (aura).

Korotkov undertook a range of studies, ably summarised in a book chapter by Beverley Rubik PhD (<https://www.korotkov.co/archive/wp-content/uploads/2014/04/2002-Rubik-Scientific-Analysis-of-the-Human-Aura2.pdf>) of the Institute for Frontier Science (Oakland, California), showing how therapies that induced mind-body changes such as therapeutic touch (Fig. 3), hypnosis and qigong produced changes (greater coherence) in energy emission patterns in the biofield post-intervention.



**Figure 3.** Composite aura for normal healthy female (50) before (A) and after (B) administering therapeutic touch therapy.

The human biofield can be readily visualised using the commercially available Bio-Well system (<https://intranet.newearthnation.org/assets/docs/contributors/2014-01-Book-BioWell.pdf>) which utilises Korotkov's GDV camera. This can be very useful as a means of detecting changes to the biofield caused by interventions or different emotional or physical states.

The biofield is a network that allows energy to flow along invisible channels, points and centres that coincide with the meridian system of traditional Chinese medicine (TCM) and the *nadis* of Ayurveda. Both these traditions have given names many thousands of years ago to the energy that flows through these channels and points, these being referred to as *qi* and *prana* in TCM and Ayurveda, respectively. Our contemporary perception of the human biofield is also consistent with the Jainist concept of the interactive karmic field called *kārmaṇa śarīra* ([https://en.wikipedia.org/wiki/Types\\_of\\_Karma\\_\(Jainism\)](https://en.wikipedia.org/wiki/Types_of_Karma_(Jainism))) which refers to a subtle energy body that emanates from and surrounds the soul and interacts with consciousness and emotions to allow the soul to experience life as we know it in the material universe.

>>> For more information on the human biofield, read Beverley Rubik's 2002 paper in the *Journal of Alternative and Complementary Medicine*, 'The Biofield Hypothesis: Its Biophysical Basis and Role in Medicine' ([https://www.researchgate.net/publication/10875131\\_The\\_Biofield\\_Hypothesis\\_Its\\_Biophysical\\_Basis\\_and\\_Role\\_in\\_Medicine](https://www.researchgate.net/publication/10875131_The_Biofield_Hypothesis_Its_Biophysical_Basis_and_Role_in_Medicine))<sup>1</sup>.

## **2. Every cell of every living organism emits light as biophotons which appears to be critical to cellular communication within the body.**

Some of the pioneering work of Gurwitsch in the 1920s, and that of Fritz-Albert Popp in the 1970s, that led to Popp's biophoton theory, has already been touched on above (</news/feature-frequencies-unearthing-the-mysteries-of-life/#popp>). We are literally (like all living organisms) beings of light! Extensive research is ongoing in the field of biophysics, although only some of this relates to work on biophotons.

There is increasing scientific recognition that biophoton emissions are critical to cellular information transfer (<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0005086>) and communication (signalling) within the body, these emissions likely functioning in the quantum domain. This is evidenced by research that shows long-range effects (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC555573/>) without any physical contact between molecules, in contrast to biochemical molecular notions of signalling.

The almost complete reliance on a biochemical and molecular view of human biology by pharmaceutical companies may explain in part the lack of effectiveness of many drugs as well as their propensity to induce harms, or so-called side effects.

It is becoming increasingly well accepted in the scientific literature (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3786266/>) that cell-to-cell communication can occur in the absence of any biochemical or physical signals, suggesting the role of ultra-weak electromagnetic forces or so-called subtle energies. It also opens the door to theories such as those proposed by the Scottish mathematician and scientist, James Clerk Maxwell, who developed the classical theory of electromagnetic radiation and the notion of “action-at-a-distance” (<https://arxiv.org/abs/hep-th/9510052>)” which was later associated with quantum mechanics and entanglement theory.

The practical application of the work of Popp’s past research team has been picked up by Dutch economist-turned-biophysicist, Johan Boswinkel, who founded the Health Angel Foundation (<http://www.biontology.com>). Boswinkel and his team have developed Biophoton Light Therapy, also known as Biontology, along with associated devices (e.g. Chiren 3.0) that have their roots in electroacupuncture according to Voll and rely on a footplate and handrods to allow interactions with the body’s energy system. Boswinkel upholds that disease begins with a lack of light and maintains, as did Popp, that coherent light within the body contributes to health, while chaotic light induces disease. His team’s work has also shown that the biophoton emission in cancerous cells is around half that in healthy cells.

Find out more about Biophoton Light Therapy in an interview with Johan Boswinkel published by Biontology Arizona.

### **3. DNA strands have the ability to recognise similar DNA strands from a distance and the specific pairing of nitrogenous bases that make up DNA appears to be driven by electromagnetic energy.**

In 2008, a ground breaking study (<https://pubs.acs.org/doi/pdf/10.1021/jp7112297>) by Baldwin and colleagues at Imperial College London and the US National Institute of Child Health in Bethesda, USA, published in the *Journal of Physical Chemistry B*, showed that intact, double-stranded DNA has the ability to recognise similar strands from a distance. Not only that, the nitrogenous bases of the 4-letter alphabet of DNA comprised of adenine (A), thymine (T), cytosine (C) and guanine (G) pair up and bond to make up new DNA in very specific and predictable ways, A to T and C to G, as discovered years before (<http://henge.bio.miami.edu/mallery/lec/150/gene/chargaff.htm>) by the biochemist Erwin Chargaff, but not through biochemical or physical attraction.

The experiments confirmed that the process is not driven by biochemical attraction between proteins or physical contact as was previously thought, but rather through an independent self-seeking process that has been referred to as ‘telepathic’ (<https://phys.org/news/2008-01-genetic-telepathy-bizarre-property-dna.html>). When one takes note of biophotonic emissions from DNA, as shown by Popp and others, as well as evidence from researchers Nina Schwalb and Friedrich Temps at Kiel University of differing light sensitivities of DNA according to base sequences, it seems more than likely that these effects are driven by electromagnetic interactions functioning in the quantum domain, although this has yet to be proven.

Once again, this is yet more evidence pointing towards the crucial role of quantum entanglement, a central pillar of quantum mechanics, sometime referred to as “spooky action at a distance” (<https://www.livescience.com/what-is-quantum-entanglement.html>). But let’s remember, things are only spooky when we don’t understand them properly.

### **4. Life on Earth has evolved with our planet’s magnetic fields and Schumann resonances.**

Given that life on Earth has evolved on a magnetic planet (hence the north pole, and south pole, that periodically flip (<https://www.sciencefocus.com/planet-earth/earth-magnetic-field/>)), and all of life is continuously exposed to electromagnetic forces both from Earth, and from the sun, it is highly improbable that the human body would be insensitive to electromagnetic processes.

Prof Winfried Otto Schumann of the Technical University of Munich deduced in 1952 (<https://www.degruyter.com/document/doi/10.1515/zna-1952-0202/html>) that the Earth must have a pulse given our negatively charged planet exists within a positively charged ionosphere (hence the existence of lightning).

Schumann and colleagues found that the fundamental frequency of the Earth, what is now regarded as the first harmonic of the Schumann resonances (<https://schumann-resonance.earth/>), of approximately 7.5 Hz, is a product of the interactions between the speed of light and the Earth’s circumference. Subsequent harmonics have been revealed that are separated by intervals of about 6 Hz. There is a remarkable similarity in the shapes and patterns of these Schumann resonances and the patterns recorded by EEG from the human brain (see here ([https://www.researchgate.net/publication/277934441\\_Quantitative\\_Evidence\\_for\\_Direct\\_Effects\\_between\\_Earth-Ionosphere\\_Schumann\\_Resonances\\_and\\_Human\\_Cerebral\\_Cortical\\_Activity](https://www.researchgate.net/publication/277934441_Quantitative_Evidence_for_Direct_Effects_between_Earth-Ionosphere_Schumann_Resonances_and_Human_Cerebral_Cortical_Activity)) and here ([https://www.researchgate.net/publication/279743125\\_Schumann\\_Resonance\\_Frequencies\\_Found\\_within\\_Quantitative\\_Electroencephalographic\\_Activity\\_Implications\\_for\\_Earth-Brain\\_Interactions](https://www.researchgate.net/publication/279743125_Schumann_Resonance_Frequencies_Found_within_Quantitative_Electroencephalographic_Activity_Implications_for_Earth-Brain_Interactions))).

It has become increasingly evident that these electromagnetic resonances have profound effects on life on Earth and interact with a wide range of bioregulatory processes as well as the human mind and even consciousness.

>>> Find out more about Schumann resonances and their effect on bioregulation [here](#)

(<https://www.biologicalmedicineinstitute.com/post/2019/09/20/schumann-resonances-and-their-effect-on-human-bioregulation>)

## 5. Water (that is so vital to life) isn't just a bunch of independent H<sub>2</sub>O molecules.

According to a quantum-field theoretical approach, liquid water isn't comprised of a collection of independent or randomly bonded H<sub>2</sub>O molecules. Instead it is made up of large assemblies known as coherence domains (CDs) of molecules

(<https://pubmed.ncbi.nlm.nih.gov/21185545/>), kept phase-correlated by electromagnetic coupling.

This is consistent with the theory of the fourth phase of water, or EZ water, proposed by Prof Gerald Pollack at the University of Washington, about which my colleague Meleni Aldridge wrote an article ([/2018/07/18/ez-water-the-water-that-makes-us/](#)) after I had the opportunity to speak at a conference on water at the Royal Society of Medicine alongside Prof Pollack and the late Prof Luc Montagnier ([/2018/07/18/will-homeopathy-be-saved-before-its-too-late/](#)).

Water also readily transmits electromagnetic energy, and so it makes sense that it is a vital medium in which to store and transfer energy and information, including the information comprising the genetic code of life held within DNA. This view was held by Montagnier and offers support for a mechanism of action of homeopathy. It is also supported by experimental evidence

(<https://waterconf.org/wp-content/uploads/2022/04/Transduction-of-DNA-Information-Through-Water-and-Electromagnetic-Waves-Prof-Dr-Montagnier.pdf>).

Bound water layers on the collagen fibrils provide conduction pathways for rapid intercommunication throughout the body via subatomic particles such as protons, enabling the organism to function as a coherent whole.

>>> Find out more about collagen water structure in an article by the late Dr Mae-Wan Ho [here](#) ([https://www.i-](https://www.i-sis.org.uk/Collagenwaterstructurerevealed.php)

[sis.org.uk/Collagenwaterstructurerevealed.php](https://www.i-sis.org.uk/Collagenwaterstructurerevealed.php)).

## 6. The tails of Salamanders tell a story.

I would like to wrap up these six points that support the intimate relationship between electromagnetic fields, quantum entanglement and life with a tale of a tail. That of a salamander.

The story is based on discoveries by orthopaedic surgeon and biophysicist, Dr Robert O Becker ([/news/feature-frequencies-unearting-the-mysteries-of-life/#becker](#)) in his work on frogs and salamanders, details of which are described in his book, *The Body Electric: Electromagnetism and the Foundation of Life* (1976, 1998, William Morrow, 388 pp) (<https://www.amazon.co.uk/Body-Electric-Robert-Becker/dp/0688069711>) that I'd mentioned earlier.

Becker's work on salamanders, showing that the regeneration of legs, tails and even the spinal cord following amputations or deliberate injury in his lab, wasn't unique in itself at the time. It was already well known that salamanders have amazing regenerative powers. What was ground breaking was the measurement of the electrical potentials following injury and during regeneration.

Becker and co-workers found that when a limb or spinal cord was damaged, the damaged area would develop an electronegative (increased) charge, this representing the salamanders upregulation of the healing response that would in turn trigger the regeneration process. However, when a positive electrode (that would steal bioelectrical energy from the site) was placed at the site of damage, limbs or the spinal cord would not regenerate. It was as if the healing current had been removed, a notion that was verified when a negative electrode (that acted as a voltage donor) was placed at the site, causing the limbs to regenerate faster than without the electrode.

Becker's work went on to be able to show that this regeneration was triggered by the bioelectromagnetic currents converting what would, in other animals, be scar tissue cells, to stem cells that would revert to their embryonic state so kicking off the regeneration process. Not only that, Dr Becker pioneered work that showed that silver ions had the ability to accelerate this process, one that he called the Iontopheretic System for Stimulation of Tissue Healing and Regeneration (<http://www.rexresearch.com/becker/becker1.htm>) that was subject to patents. This bioelectromagnetic enhancement led to the common practice today of silver impregnation of wound dressings, and the less common application of silver-based liquids and gels directly to wounds, an incredibly effective method that is now threatened by regulators who see fit to protect their paymasters, the pharmaceutical industry.

Among Becker's other findings was the relationship between an animal's complexity and capacity to regenerate, and its incidence of cancer. As amphibians, salamanders are among the least specialised land vertebrates, they have incredible regenerative capabilities, they very rarely get cancer, and cancer is very difficult to induce in them in the lab. Frogs, by comparison, are much more specialised



for their amphibious way of life, they regenerate very little, and commonly suffer a range of different cancers.

With this in mind, humans, with our complexity and very poor regenerative capacity, are highly susceptible to cancer, such that more than one in every four of us are expected to die from cancer (<https://www.cancerresearchuk.org/health-professional/cancer-statistics/mortality/all-cancers-combined>).

That is perhaps unless we can make our energy biofields more coherent, something that's hard (but far from impossible) to do in a world increasingly exposed to human-made, novel low-frequency radiation and new-to-nature chemicals to which we have not been exposed through the majority of our species' evolution.

## End note

Having hopefully, in this feature on frequencies (Part 1), made a reasonable case for the crucial importance of electromagnetism to life, in the next part (Part 2), to be published on our website ([/](#)) in a couple of weeks, we will be taking a deeper dive into frequency-based technologies used for health and wellbeing. Some of these technologies aim to measure and assess the state of the human biofield, and many also offer treatments that aim to improve its coherence with a view to preventing or treating disease.

This really talks to the modality of frequency medicine that Einstein alluded to around a century ago. We should recognise that many of these technologies are at different stages of development. Some have been evaluated clinically or under laboratory conditions much more extensively than others, while others have been little publicised owing to concerns by their makers or sellers that medical regulators will shut them down.

Others still, have been pushed aggressively by zealous marketeers, sometimes with little or no evidence of benefit, and even without the support of any plausible mechanism. Presently – it has to be said – we are living in something of a Wild West when it comes to frequency medicine devices, and the German-speaking countries that have had the longest tradition of research and development in this field, still lead the world globally. But as the field gains popularity all over the world, it is surely high standards of ethics and self-regulation that will offer the best chance of suitable, safe and effective technologies becoming accessible to the millions who might benefit.

There is no doubt in our minds that Einstein was right in that the medicine of the future will be the medicine of frequencies. But to get there, we still have a long way to go in helping sufficient numbers of people, including doctors and other health professionals, to first understand that electromagnetism currently offers the best explanation for the driving force of life.

**In this light (excuse the pun), please do what you can to share this feature as widely as you can, and we look forward to sharing Part 2 with you in two weeks time.**

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