

EPIGENETICS – WE ARE MORE THAN OUR GENES



The Way Forward

Epigenetics literally means ‘control above genetics’. This new science has profoundly changed our understanding of how life is controlled. In the last decade, the research in this area has established that the DNA blueprints passed down through genes are not set in concrete at birth (Prey 2004; Silverman 2004), something that has been described as pleomorphism i.e., there are many possibilities. In other words, genes are not our destiny. They are a factor in the human story, but they do not set us on an inevitable course that cannot be changed. The other factors that modify our genes without changing the actual blueprint, are emotions, stress, nutrition, and other environmental influences.

These modifications can be passed on to future generations as surely as DNA blueprints (Reik and Walter 2001; Surani 2001). Epigeneticists are helping us to understand that there are 2 mechanisms by which organisms pass on hereditary information i.e., through nature (genes) and nurture (human behaviour). If we only look at one of these, we miss the influence and power of the other. For example, we now know that emotions create a myriad of neuropeptides, which influence and can alter the destiny (the behaviour) of the cell. Food has a similar influence, which is why we keep referring you back to *The Story of Health* (see our Philosophy and Approach). Also see the work of Candace Pert Ph. D. and Bruce Lipton Ph. D., to further enhance your understanding in this area.

The story of epigenetics is the story of how environmental influences and signals influence and control the activity of genes. In other words, there is an environmental signal which goes to a

regulatory protein (which directs the activity of genes) and only then does it go to the DNA (which represents the cells' long-term memory) and the RNA (which is the active memory). The end product is a protein (proteins are the driving force of the human organism – our bodies are literally protein machines). So, everything taking place within the body depends on the protein interactions (it takes over 100,000 different types of protein to keep us alive).

All of this is really helping us to see that we can no longer use genes to explain why we are at the top of the evolutionary ladder, because if we were to look at ourselves purely in genetic terms, the results of genome projects show that humans have roughly the same number of genes as rodents! (Blaxter 2003, Celniker et al 2002). And yet the differences in our capacities are there for us all to see. Other genome projects have also highlighted this important truth, when it was expected that it would take at least 120,000 genes to manage all aspects of human physiology and function, geneticists, in fact, found that the entire human genome consists of approximately 25,000 genes (Pennisi 2003; Pearson 2003; Goodman 2003). So, you can see there are other factors at play.

Our Programming Really Matters – Even Before We Are Born

You will have gleaned from our philosophy and approach that we have a holistic and integrative approach and some of our pre-occupation with the past exists because we know that we are all by-products of our pasts. In some quarters of the psychotherapeutic movement, the role and relevance of the past is considered to be out-dated and inconsequential. We would want to stress that looking to the past for its own sake or treating it as a self-indulgent pastime, is not only unhelpful but self-limiting. However, to understand the role the past plays is crucial - and the new face of biology is bearing testimony to that. The latest research is showing us that parents act as genetic engineers, and this process begins even before conception.

In the final stages of egg and sperm maturation, a process called genomic imprinting adjusts the activity of specific groups of genes that will go on to shape the character of the child yet to be conceived (Surani 2001; Reik and Walter 2001). This research suggests that what is going on in the lives of parents during the process of genomic imprinting has a profound influence on the mind and body of their child. Which is why the work of Verney and Weintraub (2002) has helped state what many of us would consider to be obvious, which is that parents do better when living in a calm and stable environment supported by family and friends and free of addictions.

The developing child receives far more than nutrients from the mother's blood. Along with nutrients the foetus absorbs excess cortisol (a stress hormone) if the mother is chronically stressed. As the stress hormones pass through the placenta the distribution of blood flow in the foetus alters, which in turn affects the developing child's physiology. A good example of this is the fact that excess cortisol switches the mother's and the foetus's system from a growth state to a protective posture, which at the time of foetal development is psychologically and emotionally restrictive. This puts the foetus in a state of anxiety and hyper-vigilance, hardly a desirable position for an unborn child. The nephron cells, which are involved in the regulating of body salt and the control of blood pressure, are equally handicapped by excess cortisol (Lesage, et al, 2004; Christensen 2000, Arnsten 1998; Leutwyler 1998; Sapolsky 1997; Sandman, et al, 1994). This is just one example of how a biological chemical can affect the growth and development of the child, even before birth. Once the child is then born, the stakes are raised even further.

The Relevance of The Past to The Present

Mendizza and Pearce (2001) concluded that children need parents who can playfully foster their curiosity and creativity in order to encourage the 'wonder' that accompanies their children into the world. If we are to bring the best out of our human potential, then what we are doing to our children really matters. We are all a result of our nurturing. Mary Carlson, a neurobiologist, famous for the work she did with the Romanian orphans, concluded that the lack of touching and attention severely stunted the children's growth and adversely affected their behaviour. Her research showed that the more stressed a child was the more cortisol was found in the blood, and the worse the outcome for the child (see The 3 'A's and Child Centred Awareness – Reach resources).

There is an enormous body of evidence underlining the importance of touch and social contact. What we can conclude so far is that those subject to such conditions have abnormal stress profiles and are therefore more likely to become violent sociopaths (Prescott 1996). So, the growing brain of a young child depends heavily on the social and emotional context in which it lives. These experiences influence the expression of genes, which in turn determine how neurons in the brain connect to one another, creating the neuronal pathways that give rise to our mental tendencies (Rita Carter 2001). And so, what happens to us in the past is indeed relevant to the present and understanding this can help us reclaim the now. If we are to understand that much of what has influenced the way we perceive ourselves has been passed down through various 'filters of perception', and have often been imbibed as the 'truth', we may as adults choose to scrutinise and analyse our beliefs more thoroughly, to see if what we are bound by does indeed reflect who we are and where we are striving to go. It's vital to reclaim our self-awareness, to sit back on the thrown of our consciousness. Our lives only belong to us when we exercise the gift of choice and free will.

The Ghost in The Machine?

Could it be the 'ghost in the machine' that Descartes referred to, the soul, a spiritual force that transcends matter and yet brings its presence to bear on the way human atoms and molecules behave? This is a question that epigenetics does not provide any conclusive answers to, but it certainly is inviting us to look at what is really going on in the universe at a much more subtle and invisible level. It is helping us to break free of the notion that our DNA, in other words our genetics, is responsible for all of human life. We, at Reach, do believe in the 'ghost in the machine', a soul, a higher self.

The amazingness of the mind-body system, we believe, points to a consciousness greater than matter. Despite the miracle of the body (matter) there is 'something' that influences and directs it. Who is it that creates the thought that instructs the brain to produce the neuropeptide (the molecule of emotion)? What is the catalyst for the millions of activities taking place simultaneously in the body? (See The Story of Light 1 & 2 – Resources page). What is the wisdom that can enable a multitude of activities to happen unconsciously whilst you're engaged in quiet, thoughtful reflection?

The magnificence of life is driven by something beautiful, and it seems to us that when 'it' is in control life is magical and wonderful, and when it is not the lottery of nightmares begins. We believe you are the ghost in the machine, the one who is reading, interpreting, and understanding these words, the one behind the eyes, listening through the ears, speaking through the mouth. The one who sits in the heart of the brain, juggling the colossal energy and phenomenal information that

makes life at all levels possible. Why not try connecting with your ghost? In other words, start listening to your heart, start honouring your truth and you may find it's not a ghost at all... It is you.

Good and Bad Vibes

You're all familiar with the idea of good and bad vibes, which really is the story of energy waves. And although this language smacks of 'new ageism', all it is really doing is explaining the truth that every atom has both negative and positive charges, coupled with a spin rate, which generates a specific vibration (Oschman 2000). As different energy fields come into contact with one another, they 'interfere' with each other's resonance. Imagine a pebble being dropped into a body of water and as the pebble collides with the water, a series of ripples is formed. Now imagine two stones being dropped at the same time into the same body of water and the ripples that they independently create come together causing something described as 'constructive interference'. This is also known as a harmonic resonance. This affect leads to a doubling of energy where the ripples 'interfere' with each other. If you now imagine 2 stones being dropped at different times, when their ripples come together, they would not be resonating at the same rate and therefore would not be in harmony. This is described as 'destructive interference', which leads to a cancelling out of energy. In destructive interference, what you have is a situation where the atoms' vibrations cause the other atoms to stop spinning (Chu 2002).

This concept of constructive interference would explain an awful lot of things when talking about good vibes and bad vibes. Clearly good vibes make us feel twice as good because we are in harmony with that thing or that person, whatever the stimulus might be. So, the marriage of those vibrations leads to 'double benefit'. Equally, when there is destructive interference, which we can call bad vibes, there is a cancelling out of energy, which may leave us feeling anything from neutral to awful. A good example of constructive interference can be found in allopathic medicine with regard to the treatment of kidney stones. Kidney stones are crystals whose atoms vibrate at specific frequencies and doctors non-invasively focus a harmonic frequency on the kidney stone. Constructive interference results when the focused energy waves interact with the atoms in the kidney stones. The kidney stones in turn vibrate so quickly that the stones explode and dissolve. The small remaining fragments can then be easily passed from the system without the excruciating pain that accompanies large stones (Lipton 2005).

So, here we can see good vibes in a conventional arena performing wonders. Could this phenomenon also explain hands-on healing, absent healing, reiki, prayer and meditation etc.? All of which are activities where the power of the mind seeks to establish a 'good' connection either with someone who may not be well, a Divine being or a pure goal of some kind, and through that good connection foster a good outcome. Is it not becoming clear that the reason these activities have some proven benefit is because they all seek to create constructive interference, which is essentially harmony, and it is at this level that all healing takes place (Hamilton 2001).

Are You in Control?

So, what we have established so far is that you are the major shareholder in your life. Genes play a part but in fact it's how our genetic information interfaces with our environment that is pivotal. In other words, the choices that we make determine how our genetic story unfolds. Our choices really

matter. The chief factors that define how nature and nurture relate to one another are food and nutrition, hydration, relationships, pollution and environmental influences, upbringing and social contact, a life of meaning and purpose, just to name a few. The outdated debate about whether it's nature or nurture is well and truly buried by the expansion of our understanding through epigenetics.

A more accurate description would be nature plus nurture. We come with a set of predispositions but according to our relationship with the environment (which includes those in it) our predispositions are either diluted or accentuated. It is time to take the latest evidence and make the necessary changes in our lives. We are not victims unless we choose to be. You are the chairperson of your own board. Exercise the power and the rights that come with that position. Make the choices that will set you on a better course. In the work of Candace Pert, her research clearly demonstrates, through self-consciousness that the mind can use the brain to generate 'molecules of emotion' that are able to override the system. In other words, proper use of consciousness can bring health to an ailing mind and body. Where self-consciousness is absent the molecules of emotion (neuropeptides) that are produced, simply create dis-ease through the mind and disease in the body (Pert 1997).

We can actively choose, by becoming self-conscious, to respond differently to environmental signals. The conscious mind's capacity to override the subconscious mind's pre-programmed behaviours is the foundation of free will. The big problem we have, however, to achieve this is that so much of our programming tells us we are not worthy, we are not good enough, and because of such beliefs we are driven down destructive pathways. Unfortunately, our subconscious mind does not have discrimination. It is driven by the evidence of our past experiences (see *Persuading the Body 1 & 2 – Reach resources*). So, because perception i.e., what we believe about ourselves, controls biology, we are handicapped by the fact that whether these perceptions are accurate or not, they can drive us away from our potential and purpose. It is imperative that we change this (see *Focusing with Faith and Miracles Are Made – Reach resources*).

Nocebos vs Placebos

Mahatma Gandhi said, 'Your beliefs become your thoughts, your thoughts become your words, your words become your actions, your actions become your habits, your habits become your values and your values become your destiny.' Stop and think about this before reading any further.

An enormous amount of research has been done around placebos, particularly in the area of depression. Professor Irving Kirsch (2002) found that 80% of the effect of anti-depressants could be attributed to the placebo effect. In more than half of the clinical trials, the 6 leading anti-depressants did not out-perform placebo sugar pills. The placebo effect is considered to be so real that some have proposed placebo pills be the first treatment for patients with mild or moderate depression. What placebos have helped us to understand is when the mind changes it unquestionably affects our biology. It is not all in our heads. The placebo effect affects the body too (Leuchter et al 2002).

Nocebos are negative beliefs. As explained in the previous categories, our perception dictates how our biological processes act out. If you believe something to be true even if it isn't, you produce the corresponding neuropeptide. So, let's assume that 'something' makes you feel anxious. The factory of the brain is then busy producing anxious molecules, which in fact are proteins but these proteins

are toxic. Countless toxic proteins now flood your body, and these neuropeptides attach to the receptor sites on the cell membranes and literally have intercourse with those cells. The emotion of anxiety is now locked into your cells, influencing their behaviour and destiny. You subsequently discover the thing that made you anxious was no threat at all, but by this time your perception has already taken you on a biological rollercoaster of negative consequences. Here we can clearly see the nocebo effect. What you believed to be the case has dictated your experience, whilst the truth has passed you by.

When the mind, through positive suggestion, improves its health or its position, it is referred to as a placebo effect. Conversely when the mind is engaged in negative suggestions that can damage its health or diminish its position, this is known as the nocebo effect. Hopefully, what is becoming clear is we are in danger, if we don't sit in the seat of consciousness in the board room of the mind, of being subject to a take-over by the nocebo effect. The nocebo effect, if left unchallenged, leaves us driven by perceptions often not our own, that are incredibly self-limiting. It's time to call an Extraordinary General Meeting to reclaim your position as Chair. Change starts by making a plan, so make a promise to yourself to do that now (see Spirit, Mind, Body Plan, Personal Prayer 1 & 2 and Key Principles for Growth 1, 2, & 3 – Reach resources).

In Summary

Epigenetics is helping us to understand many things at many levels. Using modern language, it is helping us to unravel many of the mysteries of the past. Could it be that science is now catching up with spirituality? We think it is. The more you are a student of the past the more the discoveries of the present are simply pointing to modernity, now reluctantly bowing at the altar of antiquity. It seems to us that in the name of progress we had thrown the baby out with the bathwater and we're now, rather sheepishly, trying to put the baby back together again and put it back in the bath! Many of the alternative and complimentary healing modalities do, in fact, work. We are beginning to understand that this is in part due to the amazing relationship between thoughts and matter.

Epigenetics ends the separation of mind and body and understands that there is an on-going, subtle relationship where one is always influencing the other. What we are doing to our bodies is influencing our minds and what we are thinking in our minds is influencing our bodies. Is this really that revolutionary? It seems to us that science is simply catching up with the wisdom of our ancestors.