THE BIOLOGY OF BELIEF

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A cell's life is fundamentally controlled by the physical and energetic environment with only a small contribution by its genes. Genes are simply molecular blueprints used in the construction of cells, tissues, and organs. The environment serves as a "contractor" who reads and engages those genetic blueprints and is ultimately responsible for the character of a cell's life. It is a single cell's "awareness" of the environment that primarily sets into motion the mechanisms of life. Prologue xiii

It is my hope that everyone who reads *The Biology of Belief* recognizes that many of the *beliefs* that propel their lives are false and self-limiting. You can take control of your life and set out on the road to health and happiness, and you can band together with others you meet on that road so that humanity can evolve to a new level of understanding and peace.
Prologue xvi

"When a gene product is needed, a signal from its environment, not an emergent property of the gene itself, activates expression of that gene." In other words, when it comes to genetic control, "It's the environment, stupid." Page 27 & 28

There are simply not enough genes to account for the complexity of human life or of human disease.
It is clear that we do not gain our undoubted complexity over worms and plants by using more genes.
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The science of epigenetics, which is literally means "control above genetics".
Genes are not destiny! Environmental influences, including nutrition, stress, and emotions, can modify those genes without changing their basic blueprint.
Page 43

Information that controls biology starts with environmental signals, that, in turn, control the activity of regulatory proteins on the DNA. Regulatory proteins direct the activity of genes. Page 44

The story of epigenetic control is the story of how environmental signals control the activity of genes. The more sophisticated flow of information in biology starts with an environmental signal, then goes to a regulatory protein and only then goes to DNA, RNA, and the end result, a protein.
Page 45

We now know that the environmentally influenced fine-tuning described above can be passed from generation to generation. An enriched environment can even override genetic mutations in mice.
Page 46

DNA does not control biology, and the nucleus itself is not the brain of the cell. Just like you and me, cells are shaped by where they live. In other words, it's the environment, stupid.
The Stanford study found that three quarters of the variations in the immune systems of identical twins (who share the same genome) were due to "nonheritable," environmental influences including exposure to

microbes, toxins, diet, and vaccinations.
Page 49

It's become even more obvious that the belief that sequencing someone's genome could predict what diseases they would succumb to later in life is false.
Page 50

Telomeres provide the physical platform required for DNA replication.
Page 53

Stressful prenatal developmental experiences, childhood abuse (both verbal and physical), domestic violence, post-traumatic stress disorder (PTSD), nutritional deficiencies, and lack of love all inhibit telomerase activity.
The primary influence controlling telomerase activity is the mind, which is influenced by the programming we acquired before age seven.
YES…we can consciously empower ourselves by actively enhancing our own telomerase.
Page55

I had to conclude that the cell's operations are primarily molded by its interaction with the environment, not by its genetic code.
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The first big-deal insight that comes from such an exercise is that computers and cells are programmable.
The second corollary insight is that the programmer lies outside the computer/cell. Biological behavior and gene activity are dynamically linked to information from the environment, which is downloaded into the cell.
The point: a cell is a "programmable chip" whose behavior and genetic activity are primarily controlled by environmental signals, not genes.
Page 75

Hundreds upon hundreds of other scientific studies over the last fifty years have consistently revealed that "invisible forces" of the electromagnetic spectrum profoundly impact every facet of biological regulation. Specific frequencies and patterns of electromagnetic radiation regulate DNA, RNA, and protein syntheses; alter protein shape and function; and control gene regulation, cell division, cell differentiation, morphogenesis (the process by which cells assemble into organs and tissues), hormone secretion, and nerve growth and function.
Page 99

The behavior of energy waves is important for biomedicine because vibrational frequencies can alter the physical and chemical properties of an atom as surely as physical signals like histamine and estrogen.
Page 104

I do not believe that simply thinking positive thoughts always leads to physical cures. You need more than just "positive thinking" to harness control of your body and your life.
The mere thinking of positive thoughts will not necessarily have any impact on our lives at all! In fact, sometimes people who "flunk positive thinking become more debilitated because now they think their situation is hopeless—they believe they have exhausted all mind and body remedies.

What those positive-thinking dropouts haven't understood is that the seemingly "separate" subdivisions of the mind, the conscious and the subconscious are interdependent.
Page 121

When it comes to sheer neurological processing abilities, the subconscious mind is more than a million times more powerful than the conscious mind.
Neuroscience has now established that the conscious mind runs the show, at best, only about 5 percent of the time.
Our lives are essentially a printout of our subconscious programs, behaviors that were fundamentally acquired from others (Our parents, family, and community) before we were six year's old.
Page 122

Beliefs control biology!
Page 129

One indication of the power of the placebo came from a report from the United States Dept. of Health & Human Services. The report found that half of severely depressed patients taking drugs improve versus 32 percent taking a placebo. (Horgan 1999) Even that impressive showing may underestimate the power of the placebo effect: many study participants figure out they're taking the real drug because they experience side effects that are not experienced by those taking the placebo.
Page 134

Beliefs are contagious! We now live in a culture where believe that antidepressants work, and so they do.
A California interior designer, Janis Schonfeld, who took part in a clinical trial to test the efficacy of Effexor in 1997, was just as "stunned" as Perez when she found out that she had been on a placebo. Not only had the pills relieved her of the depression that had plagued her for 30 years, the brain scans she received throughout the study found that the activity of her prefrontal cortex was greatly enhanced. When the mind changes, it absolutely affects your biology.
Page 135

If you believe you can or if you believe you can't…you're right"
Page 137

Learning how to harness your mind to promote growth is the secret of life.
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
Your values become your destiny

Behavioral epigenetics has emerged that is unraveling the mechanisms that explain how donning rose-colored glasses and fostering social connections can enable your cells to thrive.
Page 138

The brain cells translate—the mind's perceptions (beliefs) of the world into complementary and unique chemical profiles
that, when secreted into blood, control the fate of the body's 50 trillion cells. So blood, the body's culture medium, not only nourishes cells, its neurochemical components also regulate cells' genetic and behavioral activity. Steve Cole, an epigeneticist at UCLA's School of Medicine, told Pacific Standard magazine: "A cell is a machine for turning experience into biology." (Dobbs 2013)
When we change the way we perceive the world, that is, when we "change our beliefs," we change the blood's neurochemical composition, which then initiates a complementary change in the body's cells.
Page 139

If you actually measure stress, using our best available instruments, it can't hold a candle to social isolation. Social isolation is the best-established, most robust social or psychological risk factor for disease out there. Nothing can compete," he told Pacific Standard magazine. (Dobbs 2013)
Page 140

That chronic interpersonal difficulties accentuate expression of pro- and anti-inflammatory signaling molecules" and that "these dynamics may underlie the excess morbidity associated with social stress, particularly in inflammation-sensitive diseases like depression and atherosclerosis"
Page 141

The evidence that belief exerts a powerful influence over physiology, gene expression, and behavior has led epigeneticist Cole to conclude: "To an extent that immunologists and psychologists rarely appreciate, we are architects of our own experience. Your subjective experience carries more power than your objective situation."
Page 147

"The quality of life in the womb, our temporary home before we were born, programs our susceptibility to coronary artery disease, stroke, diabetes, obesity, and a multitude of other conditions in later life" writes Dr. Peter Naathanielsz in *Life in the Womb, the Origin of Health and Disease.* Recently, an even wider range of adult-related Chronic disorders, including osteoporosis, mood disorders and psychoses, have been intimately linked to pre- and perinatal developmental influences.
Recognizing the role the prenatal environment plays in creating disease forces a reconsideration of genetic determinism. Nathanielsz writes: "There is mounting evidence that programming of lifetime health by the conditions in the womb is equally, if not more important, than our genes in determining how we perform mentally and physically during life.
Page 166 & 167

Research suggests that what is going on in the lives of their parents during the process of genomic imprinting has a profound influence on the mind and body of their child, a scary thought given how unprepared most people are to have a baby.
"It makes a difference whether we are conceived in love, haste, or hate and whether a mother wants to be pregnant….parents do better when they live in a calm and stable environment free of addictions and supported by family & friends.
Awake or asleep, the studies show, they (unborn children) are constantly tuned in to their mother's every action,
Thought, and feeling. From the moment of conception, the experience in the womb shapes the brain and lays the groundwork for personality, emotional temperament, and the power of higher thought."

What the father does profoundly affects the mother, which in turn affects the developing child.
Page 182 & 183

But no matter how "good" one's genes may be, if an individual's nurture experiences are fraught with abuse, neglect, or misperceptions, the realization of the genes' potentials will be sabotaged.
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Epilogue
Since the first edition of this book, scientific data have been, accumulating that show that a person's belief in religion or spirituality has a significant impact on their health and vitality.