

THE GENOMICS AGE

How DNA Technology Is Transforming the Way We Live and Who We Are

GINA SMITH

GINA SMITH is a science and technology journalist. Formerly with *ABC News*, she also writes an award winning column *Inside Silicon Valley*. She also has a weekly radio show *On Computer with Gina Smith*. Gina Smith is a graduate of Florida State University.

Gina Smith's personal Web site is at: ginasmith.typepad.com.

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MAIN IDEA

DNA (deoxyribonucleic acid) was discovered in 1953 and fifty years later, the mapping of the human genome – specifying all the genes in the DNA of the human race – was completed. Genomics is the emerging science of understanding the human genome.

Without question, genomics will totally transform the entire structure of business and society in the near future, impacting directly on:

- *Medical treatments and diagnosis* – with the promise that diseases will not only be treated but also prevented in the first place.
- *Crimonlogy and genetic profiling* – with DNA evidence testing proving the innocence of more than 144 people convicted of murders.
- *Cancer research and anti-aging methodologies* – with the hope the human life-span will be lengthened significantly.
- *The economy* – as universities and businesses pour billions of dollars into DNA-related fields

For all the inevitable hype that surrounds the emergence of the DNA sciences, the reality is DNA technology provides an almost incomprehensible array of near-term business opportunities. The challenge is to accurately anticipate the advances DNA research will bring and then position yourself and your firm advantageously.

“Predictions in science tend to be over-optimistic in the short run, but under-optimistic in the long run. I think that applies here, too. Wildly overstated expectations of immediate benefits and disease cures from the Human Genome Project helped fuel the biotech frenzy of the late 1990s, but no one I knew thought that these expectations had any chance of happening at such a rapid pace. When the investment bubble burst, some people began to complain the Human Genome Project was a failure and hadn’t paid off. But it was the outrageous predictions that failed and didn’t pay off. We will get there. It will happen. But not tomorrow or the next day. After all, it’s one thing to derive the three billion letters of the code accurately and publicly. We’ve done that. But it will now require the best and brightest brains on the planet to go to the next level of understanding.”

– Francis Collins, Human Genome Project Leader

The Basics of the DNA Sciences Pages 2 -3

- ▶ 1 A DNA Primer
- ▶ 2 Key Discoveries Timeline
- ▶ 3 How DNA Changes What We Know

Overall, the science of DNA is simple to grasp yet elegant. You don’t need an advanced science degree to understand it. All that is required is enough background information to be able to differentiate between the science and the hype.

The Six Key Areas of DNA Research Pages 4 - 7

- ▶ 1 DNA Fingerprinting
- ▶ 2 Genetic Testing
- ▶ 3 The Fountain of Youth
- ▶ 4 DNA and the Cure For Cancer
- ▶ 5 Cloning and Stem Cell Research
- ▶ 6 Gene Therapy

These are the areas where the key developments are happening at present and where the most significant near-term business opportunities are likely to arise. When these developments reach maturity and the mass market stage of evolution, the basic underpinnings of the global economy will be changed forever.

The Challenges Ahead for DNA Commercialization Page 8

- ▶ 1 The Key Ethical Questions Every Society Will Struggle With

The advance and the commercial uptake of DNA derived products and services will not be without controversy and debate. Unless you have a decent background in the science of DNA, it will be difficult to make the right decisions. Equally, it will be impossible to follow or invest in the DNA industry unless you have a feel for the challenges that lie ahead.

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