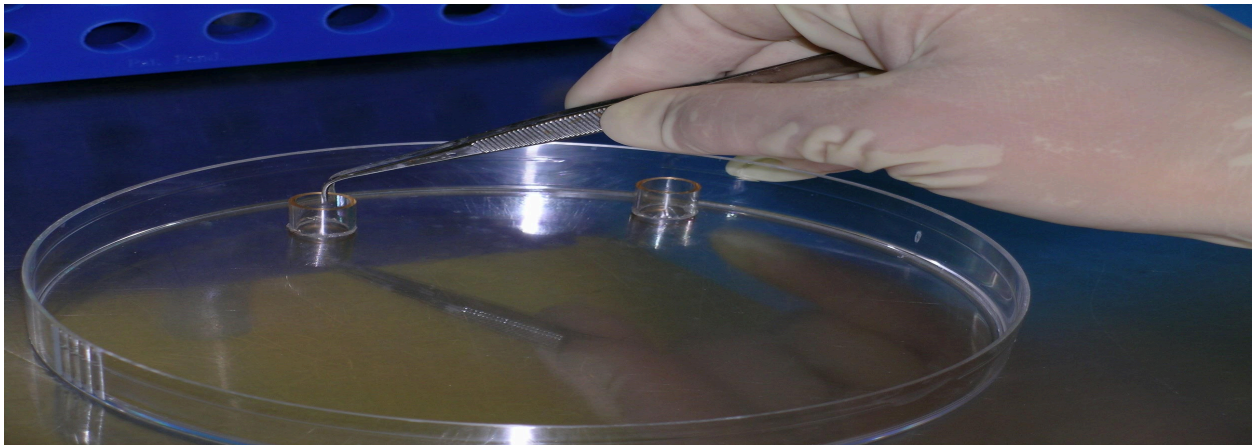


Genome Sequencing: Medical Technology Unlocking Humanity's Secrets

By: Brandon D. Lewis

As science tears down many traditional beliefs that man will never understand himself physically and philosophically, a debate has emerged among the brightest of medical professionals and the technological scientific community.

Medical technology and the scientific research behind it has allowed us to “map” our entire genetic code and it's physical behaviors. This breakthrough in the human DNA code has been declared a human triumph; yet, many perceive this science as the precursor to medical genocide. And as questions arise whether the technology is reliable enough to be implemented into medical practice, a war of ethics emerges pitting traditionalist doctors against progressive researchers.



Jacopo, Werther. [“The Human Cell-Line Colony.”](#) December 24, 2006
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The Belligerents: Doctors At War

There exist two main belligerents regarding the “mapping” of the human genome and its implementation into modern medicine. Surprisingly enough their names are rather simplistic: The Pro-Sequencing and the Sequencing Opposition.

Both groups are not really an organized community, rather a collection of medical, biotech, and genetic professionals who happen to have a certain position on the technology's future use in genome science and diagnostics.

The Pro-Sequencing party sees the use of genome mapping technology as a [vital asset in future diagnostics](#) of debilitating genetic diseases, and new research with such tech is poised to document whether certain groups of people are more genetically vulnerable to certain diseases. They believe that the technology will eventually be used to [strengthen the human genetic code](#) to become immune to the disease.

The Opposition, however, believes that the technology merely gives blanket data of the human condition, and will most likely be inconclusive when dealing with most major unpredictable illnesses- such as cancer. Also, the Opposition has recently been [transformed into a cog](#) in the Anti-Abortion political machine. They theorize that the technology will eventually be used to influence parents to abort children with a higher risk of genetic imperfection when in the [fetal phase of development](#).



Night Owl. ["Pro-Life Protest"](#) November 17, 2009
Public Domain

However, the Opposition's theories are a bit over the top. The fact in the matter is that it is currently impossible- both legally and medically- to use genome sequencing with unborn children with the aim to determine if it is "genetically ideal."

For such mapping to be implemented on an Unborn Child it would require:

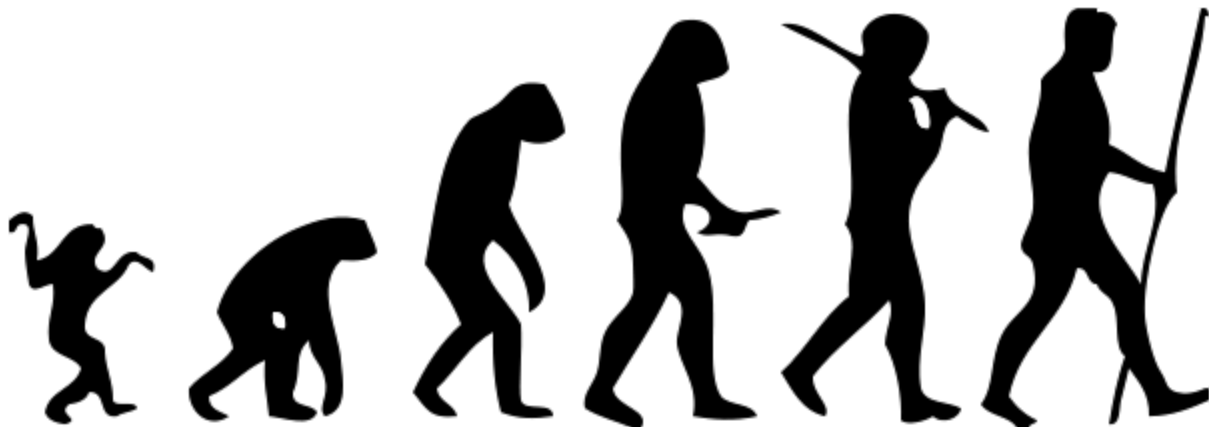
- A sample of the child's tissue is removed- while still in the womb- with a precision needle and an experienced surgeon.
- The sample must be analyzed for almost three to four months- for quality purposes.
- The sample is then cycled through a dozen gene purifiers to concentrate the sample.
- The now purified and tested sample is then given to a medical professional to present to the parents (who now have a child that is more than 4 months old).

Therefore, if abortion is desired, U.S state laws interfere and make using genome mapping as a medical reason to abort either extremely expensive or illegal. However, the technology has not made its way to the national stage so it is not definitively clear if the technology can be used for abortion procedures. Only time will tell, especially as the Planned Parenthood issue makes its way to the 2016 Presidential Debate stage.

Meet the Experts: Specialists in the Human Condition

One of the most respected proponents of gene sequencing was the world-renowned genealogist Dr. Victor A. McKusick. McKusick considered the ["Founding Father in Medical Genetics,"](#) was a Professor of Medicine for the John Hopkins Hospital in Baltimore, Maryland. McKusick presented his most acclaimed eight-page journal regarding the future of the Human Genome Project as it neared completion in 2001.

This article, *Mapping the Human Genome: Retrospective, Perspective, and Prospective*, entailed the history of the mapping of the human genome sequence and provided definitions and simplified explanations to the basic aspects of the project's research so anyone can understand modern genetics. However, it eventually began to theorize that it will be necessary for the human race to engineer its own DNA as its properties will pose a [limit to human progress](#). This "limit to human progress" has come under fire in recent years as many opposition groups view McKusick's opinions contain a superiority complex or desire for a perfect race of human beings.



Benitos, Jose M. ["Human Evolution"](#) May 2007 Public Domain

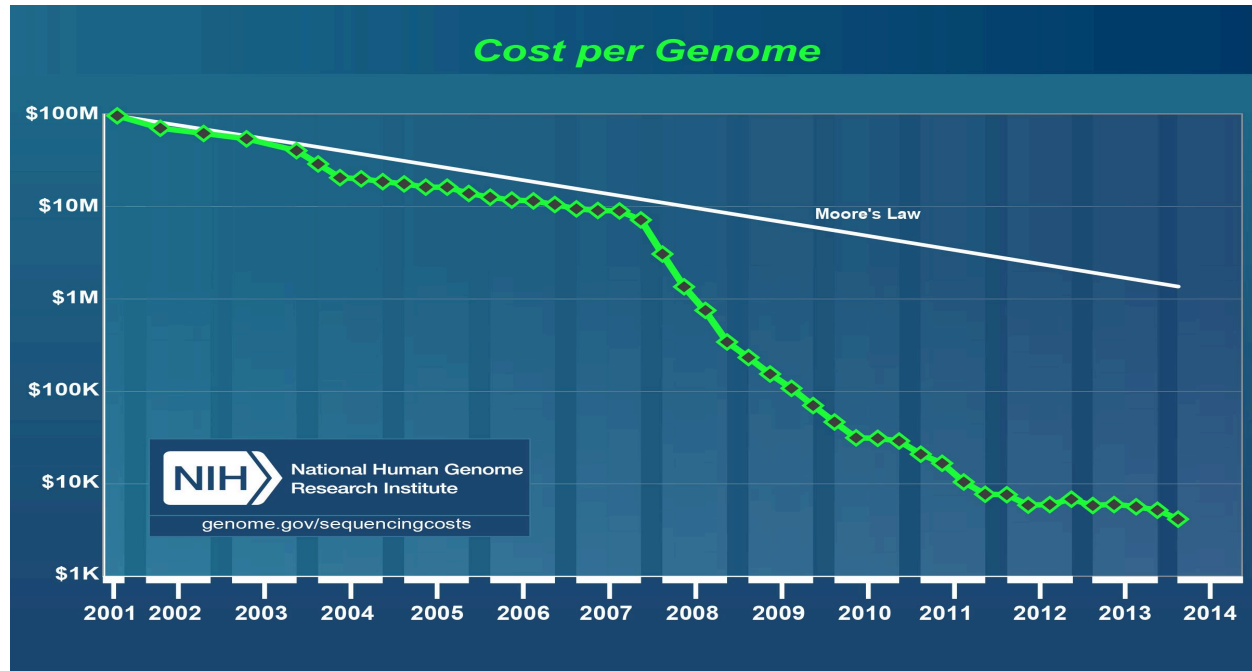
But unlike Dr. McKusick, career medical journal authors such as Donely Greer, Dr. Sara Hull, and Dr. Benjamin Berkmen- all career physicians and medical analysts- presented the most up to date opposition argument on whether it is ethical to use such genome mapping in child development; even though we have the capability of doing so.

Their book, *Prenatal Whole Genome Sequencing: Just Because We Can, Should We?* focuses more on the issue of whether doctors are obligated to inform the parents of unborn children of possible "undesired" qualities of the unborn child.

All three authors point more to hypothetical instances where a pregnant parent, being informed of a child's disability by the gene mapping technology, may abort the pregnancy due to the idea of a life dedicated to raising a disabled child.

These authors present data that may refute the expensive and drawn-out process of mapping an unborn child's DNA and genome. Dr. Berkmen finds that as technology advances and research processes become more economically feasible, more parents will be able to use such medical methods due to the lack of financial and legal strain.

Below is a DNA sequencing Cost per Genome expense statistic presented by the National Human Research Institute regarding such a decline in financial strain- outlined by Berkmen.



Wetterstrand, KA. ["DNA Sequencing Cost Per Genome"](#) Public Domain

The Growth of Conflict: The Struggle for Influence.

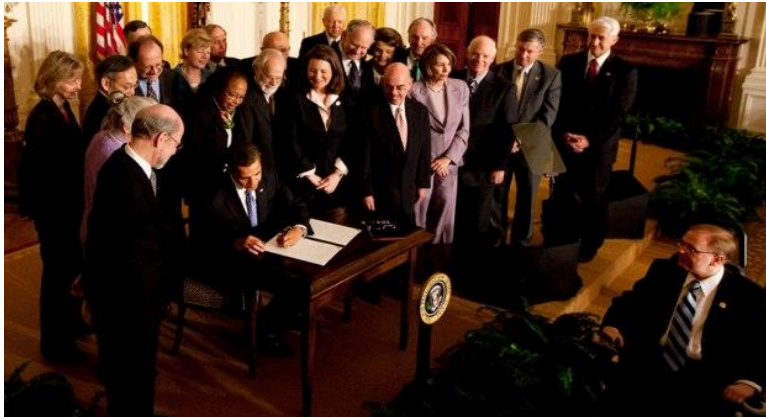
As stated above there exist two major factions to the issue, but there also exists a minor party. The pro-gene mapping supports the use of gene sequencing for diagnostics, the anti-mapping groups oppose any use of gene sequencing in medical decisions, while the "limited" sequencing groups supports the technology and its future use in medicine but aims to limit its use only to extreme medical illnesses.

This “grey” group was the original genome sequencing party, advocating for the institution of gene mapping technologies, but still noting the apparent flaws in presenting medical practices with such research. This group polarized after 2001 due to the impending [Bush Administration's](#) defunding of stem cell-related research.

By early 2008, a hand full of medical professionals who supported “Limited Sequencing” within the hospital setting began to test the waters of media by publically announcing their [dissatisfaction with the Bush Administration's handling on stem cell research](#) regulations. Igniting the fuse that would eventually tear the group apart.

While most of this issue has historically been debated in scholarly medical atmospheres and dozens of medical conferences, the groups have recently been entangled in American politics. Some factions within the three parties have vied for support from media outlets and lobbying Congress for laws favorable to their cause.

Proponents of the technology tend to target politicians who identify as politically left, and have been known to support certain medical legislation- the [Affordable Healthcare Act](#)- in order to receive funding for their research. Their means to promote certain aspects of gene sequencing- such as stem cell research- can be found in several Left-wing television outlets to medical journals.



As for the opponents, the group tends to have [right-wing support](#) politically and numerous anti-abortion/ religious groups to support the cause. Their appropriate media outlets are either Conservative newsgroups and religious news journals regarding medicine. However, even these right-wing groups have become more liberal with their positions of the technology.

Kennedy, Chuck. [“President Obama Lifts Stem Cell Bans”](#) 2009 Public Domain

But as the technology progresses, and the research behind the science becomes more substantial the Opposition has lost ground. Within recent years, the combination of political support within the [White House](#), and tech companies influencing media giant to speak favorably of their [genetic research products](#). The Opposition has been for years at a disadvantage for years, by 2005 most of its doctor and medical administration support changed positions due to the stride made in making the tech more affordable- from 10,000 dollars a person to less than a 1,000 dollars- and in reliability- jumping from 39% accuracy to 88% accuracy per genome.

Who Appears to be the Most Credible?

After analyzing speeches made by some of the most prominent figures within each group, ranging from Surgeon Generals to President Obama, I have found that the Proponents are the most credible on this issue.

This is partly due to the Opposition's failure to keep the abortion issue out of the debate. It is clear in terms of evidence used over the years and reasoning made from both sides that the

pro-sequencing faction has more research/statistical data to corroborate their claims.



“No right is more precious and fundamental than the right to life, and any just society should protect that right at every stage, from conception to natural death.”

-Ted Cruz

The proponents usually use research studies and doctoral essays supported by institutions such as the Mayo Clinic or the Institute for Human Health Services. They also tend to list the possible uses for the gene technology on patient diagnostics; as well as, physician testimonials regarding their use of mapping for treating genetic ¹illnesses.

The opposition, however, tends to use ethical and religious appeals - note the image of Ted Cruz who is an active pro-religion Congressman who opposes government funding for gene research- to support their claims. Their philosophy of medical practice and believe that the technology will bring about a “genocide” have gone unsupported or forgotten for more than a decade.

Furthermore, their fears are sometimes legally impossible or unethical. They tend to stir up these outrageous blanket accusations that doctors are naturally inclined to abuse the technology and possibly miss the real cause for a certain illness. Plus the constant reference to the idea that such mapping will allow parents to "pick-and-choose" what child to birth or abort. All of these concepts are simply not true.

¹ Skidmore, Gage. “[Ted Cruz](#)” October 7, 2011, Public Domain

When Will the Debate End?

As of 2014, the Opposition towards genome sequencing and all of its associated medical properties have used the Republican GOP candidate line up to express their concerns with such Planned Parenthood associated technologies.

One GOP front runner, Jeb Bush has stated in regards to funding Planned Parenthood and its associated technologies stated,

“I, for one, don’t think Planned Parenthood ought to get a penny, though. And that’s the difference, because they’re not actually doing women’s health issues. They are involved in something way different than that.”

What makes the issue even more politically inflamed, is that instead of correcting the public of genome sequencing disassociation for abortion, some proponents of the technology began funding Democratic candidates campaigns- sparking theories that the group desires Planned Parenthood.

The fact in the matter is that genome sequencing has and will never be associated with the abortion process or planned parenthood. The idea has been sensationalized by the opposition, poorly handled by the pro-sequencing groups, and has now been depicted as more as a means to treat birth issues than real genetic diseases. Until the facts are made clear on both sides and each acknowledges the technology’s true purpose, the issue will never resolve.

