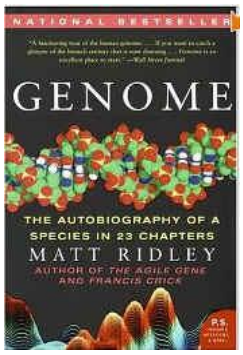


After you have read the chapters assigned in Matt Ridley's GENOME respond with the following:

-at least one thing you found interesting
-at least one thing you didn't know before you read the book
-at least one question that you have following your reading

ALSO: Reply to at least one other classmate's response.

Use a unique color to identify yourself.
Put your name in parentheses following your first post
Plus add the chapter and page so someone else can go back and read about it too!

This book has so many INTERESTING stories. I find it amazing that everyone believed that humans had 24 pairs of chromosomes for 30 years before someone actually said "Hey wait a minute! There are only 23". (Ch 2 Species; pg23)
A good example of "peer review science" in action... even if it took awhile.
(Mrs. R)

The thing I found interesting was Crick's "Greatest Wrong Theory in History", where he guessed at a code more intricate than the one nature used.(Ch 3 History; pg50) I had no idea that certain DNA sequences, such as Alu's and Line-1's, could be "selfish" and get themselves copied for the sole purpose of being copied. (Ch 8 Self Interest; pg126). My question: How does the genome create redundant copies of genes in preparation for them becoming pseudogenes? It seems like having a spare copy of every gene would be beneficial, so why does it only create extra copies of certain genes while others are left to stand alone in danger of mutation? I also agree with Jamie's view on how small differences in DNA can correlate to huge changes in phenotype. The examples the book gave on the subject really put it into perspective.

(Nick P.)

We usually think about genes changing physical characteristics like eye color or hemoglobin structure, but we don't often think of the connection between genes and other less tangible characteristics like behavior and personality.

This book really made me realize how important even the slightest alteration in a gene can be. In Ridley said that there is only a 2% difference between a human and an ape, and within an ape even a tiny change can alter its behavior. Also, in chromosome 3 if either the 69th or 901th letter changes then the person will be affected with alkaptonuria. (chapters 2&3 pg 37&52) Though we did learn about the impact of a slight change in gene code, this chapter really made me notice it even more. Something I didn't know (though not very interesting) is that the telomerase code is TTAGGG, which also leads me to my question. Does this mean that the exact same

amount of telomerase is cut off each time DNA is copied? (chapter 14 Immortality.) Though chapter 2 was not in our reading, Mrs. Riedell's response about communication between scientists made me wonder how amazing it is that scientists managed to get anything done. Communication during Mendel's time is far from what it was today. It amazes me that they got so much accomplished with such poor technology.

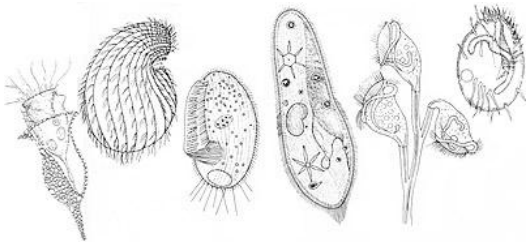
(Jamie Sterbis)

Yes, the same amount is lost each time the DNA is copied. It is pretty amazing how far we have come and how much has been discovered.... even more amazing is how much we still don't know.

Ridley's 'Genome' is a fascinating book. Ridley's unique background as a former science editor and accomplished author make it possible for a book about the human genome to read like a fiction novel. I found Chapter 14, Immortality, to be very intriguing. Most interesting to me was the notion that aging, an incredibly complex process, is influenced by more than 7,000 genes (Ch. 14 pg. 204). Yet despite the influence of 7,000 genes, telomerase plays a seemingly important role. The author believes that telomerase is incorporated in the process of natural selection, an extremely fascinating biology-evolution connection. Ridley concludes that natural selection only weeds out genetic mutations until the point of reproduction, and therefore has produced telomeres that last only until a certain point beyond reproduction. Before reading the book, I had no idea what 'free radicals' were. The book references free radicals briefly (Ch. 14 pg. 203), but I would love to learn more about them. My question: What exactly are ciliates? and how important are they in discovering more about the aging process? -- The book mentioned how they have vastly difference telomerase codes when compared to every other organism.

In response to Jamie's and Nick's posts: It really is fascinating to learn about the advances in scientific knowledge before modern-day technology. Based on Chapter 3, it seems somewhat lucky that Mendel's findings were discovered by other scientists. Also, I am very interested in Nick's question regarding the choice to create copies of certain genes but not of others.

(Sam Dunkle)



Ciliates are small (mostly) single celled eukaryotic organisms that live in water (ponds,

lakes, rivers, oceans) They belong to the Protista group. They are called ciliates because they are covered with many cilia used for movement. A paramecium is an example.

I thought it was interesting that the protein reverse transcriptase is one of the most common genes in the human genome, but it's entirely useless to us and is actually a threat to us because of the role it plays in the genome of the AIDS virus. I didn't know that there are thousands of inactive or incomplete viral genomes incorporated into the human genome; I found that a little frightening. And that "proper" genes only make up 3% of of the entire genome? It's crazy. (ch. 8, pp. 124-125) What's the point of having all this "junk DNA" anyway?

Referring to what Jamie said, I also thought it was really interesting that there is only a 2% difference between humans and apes and how tiny changes in a sequence can make an enormous difference.

(Megan McGrath)

I have the same frightened feeling that Megan speaks of when I learn of all the slivers of chance that make us healthy human beings. This may sound extremely cliche, but it is amazing the odds that create the "miracle of life". I have type O blood, so it interested me to learn that i have a frame shift mutation, one of the most severe mutations, yet it doesn't harm me. Which suggests the lighter side of genetic variation in Motoo Kimura's the neutral theory of evolution, most genetic diversity (i interpreted this as mutations) exist because the diversity doesn't matter. (Disease pp. 138-139)

I also was fascinated by Conflict pp. 105-121. This chapter introduced me to the age old war between the X and Y chromosomes. It talks about a butterfly species, *Acrea encedon,* in which the male percentage of the entire population has been reduced to a scanty 3%. Which seems to go against the core duty of a living thing, to keep the species alive. So will there ever come a time where the independent X and Y struggles for survival/dominance causes a species to fight its way internally to extinction? Also the chapter says males are evolving to become more seductive, and females are counter evolving to resist being seduced, with the example of a peacocks elaborate tail feathers as proof.

(Lynn Yen)

I thought it was interesting on page 25 Pope John-Paul II's message argued between ancestral apes and modern humans, there was an "ontological discontinuity" - a point at which God injected a human soul into an animal lineage. Thus can the Church be reconciled to evolutionary theory.

Also on page 25 I find interesting the 2 ape chromes are fused in humans and are

separate in apes.

On page 36 I find interesting the typical chimpanzee's hardware can be put together in the womb of a foreign species, but its software would be a little awry. So a baby chimp would be socially confused like human beings as Tarzan would be if reared by chimps. Well the human reared chimp would not know how to naturally hunt for food and make nest and the Tarzan reared by chimps would not learn how to speak. If similar animal hardware can be put together in the womb of a foreign species could scientists finally be able to get mammoth DNA and rear a baby mammoth from an elephant? Reading at Nick's post, I'm also interested why certain genes gets copied and not others.

I find fascinating on page 203 it talks about our bodies are continually 'rusting' from the effects of oxygen. If oxygen corrode metals and one can see the it happening, I would like to find out more about how the human body rusts, also, I would like to find out more about free radicals.

(Yang Fuller)

Genome by Matt Ridley was surprisingly easy to read and interesting, at least in my mind. Well-told stories and accurate information and sometimes a crack of humor really made it fun to read. And I liked how there are 22 and X and Y chromosomes (chapters) in the book, clever guy. Anyways, less about the book and more about genetics.

One story caught my interest while I was reading it: Archibald Garrod's encounter with the autosomal recessive disease alkaptonuria. Like Jamie mentioned, alkaptonuria is a weird genetic disease that it's not life-threatening, and because a small change on the chromosome 3, the gene suddenly put out very uncomfortable conditions that people have to endure for rest of their life. Garrod was working with several patients with that disorder. When he investigated further, he found out that the disease ran in the family. Three out of four families with the disease were first-cousin marriages. And eight out of seventeen other patients were second cousins of each other. Another interesting thing he found was that the disease would skip a generation and reappear at their grandchildren. When he published his results, not only his results further supported Mendel's experiments, Garrod's book also received very positive reviews, which is always good. Garrod concluded that it was "Inborn errors of metabolism". Errors in metabolism would mean errors in function of enzymes. And enzymes are made of proteins. And proteins are made by genes. Garrod was this close to discovering the secret of biology, but no, his theory was overlooked for several decades after his death.

Another interesting section was the Prader-Willi syndrome, one lined jumped at me and made me read it more carefully, "GENES ARE NOT THERE TO CAUSE DISEASES." (For the record, I didn't capitalize those letters, Ridley did.) When you

think about it, genes are not supposed to cause diseases. Like Ridley said, the purpose of genes is to store the recipe for making proteins. Here's a question for everyone out there: what if your parents gave you the wrong recipes? What if their parents gave them the wrong recipes?

(Lindun Lai)

I would say the chapter that was most intriguing to me was Chapter 14, Immortality. I have to agree with Sam that it is amazing how important telomeres, the "junk", are to lifespan. The idea that the length of my life might be determined by telomerase being turned off when I am only an embryo is, to say the least, mind-blowing. One thing I do not get is if telomeres are just the junk on the ends of chromosomes, why then is the code similar for EVERY living thing? And why does it differ for certain species? I would think that if the telomeres have specific coding they would have more importance than being the extra stuff protecting the DNA message.

Something I did not know was that some animals' life spans directly relate to the age they're finished breeding. Almost like they were meant to live long enough to finish their job, which apparently is reproduce,and then die soon after.

Courtney Krishnan

This whole book has interested me more than I could have imagined it to, its so amazing how we could know so little about our own species. I completely agree with Jamie's point, in how much people accomplished with such little technology. With all of the technological advances we have had in the last ten years, it seems like we as humans should be able find so much more about ourselves.

In the chapter "Instinct" I found the opening paragraphs pretty interesting. We as humans talk about how other animals have major instincts that make them survive, but humans don't necessarily have instincts. All humans do is learn, everything we do is a product of free will. Humans put themselves in dangerous situations all of the time, yet we never see other animal species doing such. This is something I never really thought about.

Also in the chapter "Instinct" Ridley talks about the research of some guy by the name of Chomsky. Chomsky began studying the way humans speak and concluded that there were underlying similarities to all languages, this proves that there is universal human grammar. We can all use this "universal human grammar", though we aren't conscious of the ability (pages 92-95). I have never made a scientific connection to human language. I always thought of language as just a way of life that just happened to be there. Everything in our universe is explained by science, but I never would have thought of applying language to that principle. As I was reading this chapter the question I often thought of as a child came back to me-"Why don't animals talk?". This childish question still ponders in my head and there is obviously

an explanation, but my question is "Will there ever be a time in the distant future where another species evolves to become as advanced as humans are?", us humans living in 2011 will never get to know the answer.

The chapter that interested me the most was "Conflict". In this chapter the X and Y sex chromosomes are said to be "The enemies within". The sex chromosomes accumulate genes that benefit one sex and misfortune the other. Ridley gave us the example of a newly discovered gene call *DAX* (pages 109-112). Three quarters of all sex chromosomes are Xs; leaving Y as one quarter. The X chromosome is therefore three times as likely to evolve an ability to attack the Y chromosome, any gene on the Y chromosome is vulnerable to attack by X chromosome genes. The Y chromosome then shuts down certain genes and runs away and hides. --> before reading this chapter I had now idea that sex chromosomes are sort of considered enemies of each other. I think its fascinating how a single chromosome can manipulate and dominate another chromosome by a single gene. And in the long run could even get close to wiping out the species it is contained in. Maybe this could be countered with Nicks question on the choice of to create copies of certain copies of certain genes but not of others?
The telomerase and how important they are to life span questions that Sam and Courtney brought up are very interesting to me also. I never would have guessed that life spans could be affected by breeding.

(Spencer Eiseman)

The chapter I found the most interesting was number 15, sex. In particular, I really liked the part of the chapter in which Ridley compares a "foetus," as the British spelling has it, to a parasite living inside the mother and competing for her resources.(pgs 208-9) This is an idea which is not altogether accurate, since having a baby is in the mother's interest, but Ridley's description of how the parental genes - working solely for the survival of the embryo - literally hijack the mother's circulatory system and force her to pump blood into the placenta, emphasizes the point made in chapter 8: genes can be in conflict and be self-interested. From this description, it would seem that genes are quite the objectivists, focused only on their own fulfillment. This concept is quite new and exremely fascinating to me, but it leaves me with a question. Are we somehow separated from our genes, "survival machines" which evolved in order to preserve them, or are we indivisible and internally co-operating entities?

In response to Jamie/Spencer's remarks on the relationship between time and discovery, chapter 3, "History," shows how Mendel's discoveries took place 40 or 50 years before the discovery that DNA was the heritable molecule, which took place only a few years before the discovery of its structure and code. So far it appears that our discoveries are increasing exponentially, or at least at a much faster rate

than they have been in the past century.

(Gabe Sexton)