Jan 26

Questions

1. History of human evolution (Evolution)

Human evolution is lengthy, it traces back to our primate ancestors over 6 million years ago! To begin, the Homo Genus first appeared around 2.5 million years ago.

Our evolution and change in thought, communication, and physical appearance are due to evolutionary pressures that lead humans to improve. Factors like climate change, diet, and social interactions led to key adaptations such as bipedalism, larger brains, and more complex forms of communication (languages). Natural selection is the main factor in this change. Natural selection favored traits that increased the overall survival and reproduction rate of humans, meaning our ancestors who didn't contribute or have traits in favor of this change were killed off → leading to the modern traits of humans today. Overall, natural selection has shaped modern human physiology, cognition, and behavior for the better.

DID YOU KNOW? Early human evolution took place mainly in Africa (The Eastern and Southern parts).
-One of the earliest significant fossil discoveries was found in East Africa such as the Omo I (early fossils of Homo genus) remains found in the Omo Kibish Formation in southwestern Ethiopia in 1960s using chemical fingerprints of volcanic ash layers that were found above and below the fossils. These are one of the earliest findings and proof for our species (Homo genus)
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We share a common ancestor with the great apes of Africa, including bonobos, chimpanzees, and gorillas. This common ancestor lived around 8 to 6 million years ago.
Humans first evolved in Africa, and most of our evolution continued from there.
One of the earliest defining human traits is bipedalism—the ability to walk on two legs—which evolved over 4 million years ago. Following this, brain development allowed for the ability to make and use complex tools and language. In the last 100,000 years, we have evolved to create complex symbolic art and develop cultural diversity.

2. What are the key biological mechanisms that drive human evolution

Evolution is always driven by natural selection, genetic mutation, gene flow, and genetic drift. Natural selection will favour traits that increase the overall survival and reproduction of the species.

Mutations: introduce new genetic variations

Gene flow, which is the exchange of genes between populations, introduces diversity.
Genetic drift: cases of random changes in gene frequency over generations

3. What is the current theory of evolution? (Theories of evolution)

Human evolution is fascinating and scientists are always trying to find theories and myths for how and why it happens. The most up-to-date theory is 'The Modern Synthetic Theory of Evolution', which essentially means that evolution happens through small gradual changes that accumulate over time. These changes are driven by factors such as mutations, gene flow, genetic drift and natural selection.

How have human traits like opposable thumbs and bigger brains helped us shape the world and make technology?
Humans have evolved to gain traits like opposable thumbs and larger brains. These traits have allowed us to change the world around us. Our opposable thumbs allow us to grip things, which makes it easier to use tools, build things and create technology. This skill has been important in farming, building houses and making machines, which are all key skills to how we live today.
Our big brains help us think, solve problems and work together. Over time, our big rains have helped us develop language, science and culture, which have been essential in creating the society we have today.

Species adapting:
Animals like chameleons and moths have developed camouflage to blend into their surroundings and avoid being seen by predators. This trait helps keep them safe and alive for longer. Over time animals adapt to their environments. In this case, animals that were able to hide better survived for longer, this allowed them to live for longer and pass on their genes. Making camouflage an evolutionary trait.
Birds also show how species adapt to. This is shown through migration. Many birds migrate to warmer places in the winter to find food and better conditions for breeding.
Both camouflage and migration show how animals change overtime to better survive in their environments. If animals remain unchanged it is unlikely they would survive.

Antibiotic resistance and bacteria:
Bacteria can evolve to resist antibiotics (drugs used to fight infections) when bacteria are exposed to antibiotics some may find that they are immune. These bacteria survive and multiply, which makes it harder for us to treat infections. This shows how evolution works quickly in bacteria, as only the bacteria that can resist antibiotics continue to grow.
This evolution of antibiotic resistance is a big problem for human health. It makes it harder to treat simple infections and can lead to more serious diseases being harder to cure.

Human immune system and disease prevention:

The human immune system has evolved to protect us from germs and diseases. It uses white blood cells to identify and attack pathogens over time, our immune system has learned to remember diseases it has fought before, making it better at fighting the same disease if it ever comes back. Some human populations have also evolved special traits to fight specific diseases. People with sickle cell anemia are less likely to get malaria. This is because their bodies have adapted over time to fight that disease.

4. What does it mean for a species to stop evolving and is that even possible?

A species theoretically could stop evolving without genetic variation, selection pressure, or reproductive isolation.

- Without genetic variation there will not be any different or new traits for natural selection to favour or act upon, leading to the population to increase much slower then it is now, so much so that it may even lead to the extinction of the species because if a calamity happened that went against the monotonous traits that every human had, we would be extinct.
- Without selection pressures (predators, environmental changes, etc.) the need for adaptations would be non-existent. Leading to the loss of genetic diversity, making the species less likely to be resilient and have higher chances of survival.
- And finally, without reproductive isolation (the genetic process that prevents different species from breeding with each other), → This would lead to the lack of genetic diversity, since every species would be breeding with each other.

However, complete stagnation is unlikely since mutation and environmental changes persist, introducing new genetic variations to occur. Even in highly stable environments, small genetic changes will occur, ensuring that there is some level of adaptation. So realistically this scenario is unlikely/ impossible to occur in this world, but we chose this concept to explore the fiction and possibility if it were to happen.

5. What factors influence the rate of human evolution today?

Many factors influence and impact evolutionary rates, some examples are:

- Population size: Larger populations are prone to have more mutant individuals, this leads to more distinct genotypes, meaning that natural selection is more effective in larger populations.
- Genetic diversity: Populations with a greater genetic diversity are more likely to adapt to changing environments.
- Environmental changes are the backbone of natural selection. They influence which genetic traits are more prone to survival in a changing environment → leading to shifts in physical traits, disease resistance, and even psychological/ behavioural traits.

- Selective pressures: Like the other factors, selective pressures will always favour individuals with different genetic variations, allowing the species to adapt to the environment around them (natural selection).

Additionally, cultural and societal factors, such as migration and mate selection, contribute to evolutionary change.

6. What are the main genetic variations in human populations today, and how do they affect survival

Skin pigmentation to adapt to UV radiation
Lactose intolerance, which is a dietary resistance
Disease resistance - the Sickle cell trait against malaria
The ability to process high altitude oxygen effectively and resistance to specific pathogens like HIV

7. How have humans adapted to different environments

Populations in high-altitude regions like the Andes and Tibet have evolved larger lung capacities or altered hemoglobin levels for oxygen efficiency. Similarly, Arctic populations have developed increased basal metabolic rates and compact body shapes to conserve heat, while equatorial populations tend to have darker skin to protect against UV damage.

8. How has evolution contributed to human survival
    - It shaped the immune system
    - Brain development
    - Physical endurance
    - It allows us to survive diverse climates and ecological threats
    - Cognitive advancement (problem solving and social cooperation), which further enhances survival

9. How has human interaction with other species influenced our evolution

Domestication of animals and agriculture changed dietary habits, while pathogens from animals (e.g., flu, tuberculosis) shaped immune responses. Interactions with predators and competition for resources have also driven evolutionary changes.

10. What would happen to the human immune system if we stopped evolving?

Evolution allows the immune system to adapt to pathogens, which allows for improved resistance over time. Without this ongoing adaptation, the immune system would become stagnant, making it difficult for humans to fight off new diseases. Pathogens would continue to evolve, developing resistance to any treatments and medications we make to fight them off.
So in summary, disease would continue to evolve as our immune system stays put.
This would leave humans much more vulnerable to infections as we would no longer be able to respond to them and develop resistance to fight them. Medical advancements like vaccines and antibiotics would also become ineffective as pathogens would be able to develop a resistance to them. (vaccines would become unusable completely, and pathogens can develop resistance to antibiotics)

In the end, without the ability to adapt humans would face a greater risk of extinction due to the inability to cope with disease and environmental changes.

11. How might new diseases impact human populations if we lose the ability to adapt biologically?

Since we would no longer be able to develop defences against emerging pathogens, we would be left vulnerable to infections. As pathogens continue to evolve, they will develop resistance to existing treatments, such as antibiotics and vaccines, creating an even greater risk for extinction to happen.

12. Could humans become extinct if we stopped evolving?

Yes, this would be the most likely case. As if genetics and evolution stopped, we would be more vulnerable to environmental changes, disease, and competition with other still-evolving species. In may even compromise our place as a top level consumer on the food chain

13. What would happen if other species continued evolving while humans did not?

Other species would surpass us in adaptation, which would lead to imbalances in the ecosystem.s
New predator - prey relationship
Competition for resources
It may even lead to the rise of a different dominant species

14. How would climate change affect humans if we stopped evolving?

Rising temperatures, altered food sources, and extreme weather would make survival difficult without adaptation to these conditions. Lack of evolutionary response could lead to widespread food shortages, habitat loss, and increased disease susceptibility.

15. How has past evolution shaped human intelligence and would intelligence change without evolution?

Past evolution has shaped the human intellect mainly by natural selection. The favouring traits were mainly problem-solving, social cooperation, and adaptability. Over time the human brain has grown larger and more complex. Over time we saw a strong development in our cognitive abilities which allowed humans to survive in diverse environments, creating a foundation for learning, innovation and cultural advancements. Evolutionary pressures, such as the need to hunt, communicate, and form social bonds, have all contributed to the sophisticated intelligence we possess today.

If humans stopped evolving, then it would likely result in a stagnation of our intelligence, since we would no longer be able to adapt to our changing environments and challenges.
Evolution has allowed humans to develop cognitive abilities best suited for their environments, and without it we wouldn't be able to naturally improve our problem solving skills or evolve in response to our environment. Essentially it's like standing still as the world around you changes rapidly. The skills and technological advancements we've made so far would help us but only to a certain extent. Without limit our capacity to adapt to unforeseen circumstances. Humans may combat it by relying on external tools like AI or brain computers, but even then we wouldn't be able to replicate the development of intelligence that comes from continued evolution.

If we stopped evolving, we would struggle to meet the new demands our environments put upon us, as normally we would combat these by evolving to fit them.

16. Could/ would artificial selection and genetic engineering replace natural selection?
Yes, genetic engineering could introduce desirable traits, but it could also create ethical concerns and unintended consequences. Dependence on artificial selection may lead to unforeseen genetic complications.

17. How does human migration affect evolutionary processes
Migration promotes gene flow, increasing genetic diversity and enabling new adaptations to various environments. It has played a crucial role in shaping modern human genetic variation.

18. What is the relationship between human evolution and fertility rates
High fertility rates have helped human populations grow. Reproduction is the main way evolution happens.

19. What would've happened if humans had stopped evolving 100,000 years ago
100,000 years ago humans were still in their early stages of development. Many modern traits such as advanced brain function and fine motor skills were still evolving. If evolution had stopped then, our cognitive abilities, problem solving skills, and language skills would be drastically different from what they are today. Most ‘systems’ and technologies we have today wouldn't exist (agriculture, cities, robots, AI, advanced medicine). We would also have increased vulnerability to disease. Human immune systems have adapted over the last 100,000 years to fight pathogens like smallpox, malaria and the flu. Without evolution humans would have been unable to develop resistance to these diseases. And looking at even the most recent pandemic, COVID-19, if we had not developed resistance, it is likely that our population would be much much smaller. Not only this, but over such a long period it is likely that hundreds and maybe even thousands of pandemics would have happened, and for humans to have survived through every single one is very unlikely. It's important to note that 100,000 years ago, earth was in the middle of an ice age and without evolutionary adaptations like lighter skin or resistance to higher altitude, many populations would have struggled to survive as the environment changed, making migration to new places with different climates nearly impossible.
Also, we would have any complex society, as to build them we depend on our ability to cooperate, communicate, and innovate. And without the cognitive advancements that we went through, we would still be living (if we hadn't already gone extinct) in math hunter-gatherer groups with no written language, agriculture or advanced tools.
Overtime we have evolved to have a wide range of physical adaptations (skin tones, lactose tolerance, resistance to diseases) based on natural selections, without evolution all humans would still resemble early homo sapiens from africa with little variation. Evolution has favoured traits that reduce infant mortality and increase life span, without evolution childbirth would remain highly dangerous and most people would die extremely young. We wouldn't have the ability to create crops and animals selectively as we wouldn't have the intelligence to do so.

Overall, if humans stopped evolving 100,000 years ago, we would likely have gone extinct by now, and if by some miracle we were still alive, we would be living in hunter-gatherer groups

with limited intelligence, minimal disease resistance, and no ability to adapt to different environments. Civilization, science, and technology would never have developed.

20. What would it look like in 100, 1000, and 100000 years if human evolution continues vs if it stopped

Evolutionary timeline comparison:
100 Years from Now:
Continued Evolution: Minor genetic adaptations improve resistance to pollution and processed diets—slight shifts in gut microbiomes for better digestion. Humans may develop greater resistance to viruses through natural selection (similar to what happened with COVID-19). There would be small genetic shifts in high metabolism, and intelligence due to things like diets, urbanization, and medical advancements. As humans evolve, so with technology, we may have to start to utilize gene editing technologies to improve ourselves.
Stagnation: No changes; continued reliance on artificial interventions like medication and dietary supplements. Without the ability to adapt, we would need stronger medical interventions to fight new diseases. As temperatures rise, populations in extreme climates may struggle to survive without natural adaptations like heat tolerance, environmental and lifestyle factors increase infertility, and humans will need to rely more on assisted reproductive technologies.
1,000 Years from Now:
Continued Evolution: Slight increases in lung efficiency and skin melanin levels due to climate change. Minor adjustments in immune responses to globalized disease exposure. If humans end up colonizing space (think Mars or the moon), those populations may develop unique genetic traits (changes in bone density and radiation resistance). Intelligence would continue to increase along with potential shifts in physical features based on selective pressures like AI integration (think cyborgs). During this time humans will evolve to interact more seamlessly with machines, possibly leading to robot-human hybrids.
Stagnation: Humans remain vulnerable to new diseases, requiring continuous medical advancements to survive. Without biological adaptations, humans will rely entirely on technology to survive new environments. Human mutations may accumulate over generations, leading to weaker immune systems and more genetic disorders. Societal collapse becomes much more likely (nuclear war, climate disaster). If a major catastrophe occurs, humans may not adapt quickly enough to survive long-term disputes. It is also likely that by this time we would have gone through multiple pandemics, and it is likely that if the human population remains it would be extremely small and frail (but for the sake of this timeline let's ignore all that)
10,000 Years from Now:
Continued Evolution: Taller, leaner body structures for heat dissipation in warmer climates; shorter, stockier builds for colder regions. Increased resistance to viral mutations. Humans would look vastly different due to selective pressure. We would have taller and more slender bodies, larger brains, and may even have new sensory abilities. Going back to space, people. Isolated populations would evolve separately, and would become a new species (think how

neanderthals turned into homo sapiens). Natural and artificial selection may lead to super intelligent humans with life expectancies exceeding 200 years. During this time, it is likely that we would be moving towards another major climate crisis, and we would be making new technology to combat that.
Stagnation (if humans continue to exist): Human populations begin to struggle with environmental shifts as genetic adaptability ceases. We would remain biologically identical to those living today, unable to adapt naturally to space, climate shift, and new diseases. During this period, it is likely that we would be moving towards another major climate shift (the ice age may come back), and we would struggle to adapt to it. Without adaptation, an unpredictable event could and probably will wipe out the human race.
100,000 Years from Now:
Continued Evolution: Eyes may enlarge for better vision in lower-light environments (especially if urbanization reduces natural light exposure). Further refinements in brain efficiency, possibly a more streamlined skull shape for better cognitive processing.
Stagnation: Population decline due to genetic stagnation, with more individuals suffering from inherited disorders.
1 Million Years from Now:
Continued Evolution: Divergence into subspecies adapted to varying planetary conditions. Possible changes in jaw size due to continued reliance on soft, processed foods. Humans will have significantly changed and possibly even split into a subspecies adapted to different environments. Advanced genetic engineering would lead to the creation of cyborgs and maybe even AI lifeforms. Humans would have expanded beyond the solar system and possibly even underground. Climate continues to change, humanity adapts using genetic and technological advancements. The population would still be in the billions, but more than they are today, as no civilization has much more space to grow and reproduce.

Stagnation: Humans may become completely dependent on artificial means to maintain genetic stability. Natural reproduction rates decline. Humans are struggling against disease and genetic degradation. There is no technological progress, the remaining humans are using minimal, low-tech technology as it is not benefiting them in any way. Most humans are living in medieval-like societies, any surviving humans are on the brink of extinction. Earth has fully recovered from human civilization - forests have reclaimed the cities. Less than a few thousand people remain
10 Million Years from Now:
Continued Evolution: Dramatic physical shifts occur. Humans may develop larger heads relative to body size due to advanced cognition. Fingers elongate for finer motor control with technology. Vestigial structures (wisdom teeth, appendix) disappear entirely. Humans may not exist as we know them, AI, cybernetic beings, or genetically modified post-humans may have taken over. A new dominant species arises. If humans still exist (and have not turned into robots) they are likely all living in space. Humanity all together may not be biological anymore.
Stagnation: Humans face high risks of extinction due to their inability to adapt to any planetary changes. No human civilization remains, if any humans survived, before they are now 100% extinct, the earth has fully restored itself. Human cities are now fossilized ruins. There are minimal signs of human civilization anyway. And there is a new apex predator

50-100 Million Years from Now:
Continued Evolution: Highly specialized physiology. Some humans may have adapted to extreme planetary environments (higher radiation, differing gravity). Potential changes in respiratory systems if atmospheric conditions shift. If humans still exist, they have transcended biology and become an advanced interstellar or post-biological civilization. Entirely new species dominate the earth, humans live completely in space. Possibly having either met or created new intelligent lifeforms,
Stagnation: Human extinction is highly likely, with surviving populations completely reliant on synthetic enhancements. The only trace of humans is fossilized bones and remains of cities. No trace of human influence on the environment remains and a new dominant species arises. Humans go extinct, the earth moves on without us. No trace of humanity exists.

ULTIMATE FATE:
If evolution continues, humans may diversify into multiple species adapted to different environments. We may integrate with technology, merging biology with AI and robots. Lifespa and intelligence may increase, leading to post-human beings that are superior to today's humans. The species may spread beyond Earth, ensuring long-term survival.

If evolution stops, humanity would have to rely entirely on technology for survival, and this dependence would make us vulnerable to disasters. Genetic decay would lead to a higher chance of disease sustainability and infertility, requiring artificial solutions to maintain population growth. A single catastrophic event could cause human extinction. If Earth becomes uninhabitable, humans will struggle to survive in space without biological adaptation.

Extra:
Vaccines and antibiotics are not evolutionary adaptations, they are technological advancements. So, in theory, vaccines and antibiotics would be our only hope, not to be taken out by diseases. In any case, when evolution stops - we stop building immunity, which means now our memory B cells will no longer store information on how to get better, so vaccines would be pointless. Antibiotics would help but that's only if we can develop antibodies after evolution comes to a halt.
Pathogens would continue to evolve and develop antibiotic resistance, and without evolutionary immune adaptation, humans would face greater health risks, which would require contract advancements in biomedical engineering and human-made medicines.

Evolutionary adaptation occurs through genetic changes passed down over generations. We explore the ideas as to what may happen to humans if this stopped.

WOULD WE STILL MAKE ANTIBODIES FOR DISEASES?
Yes, we would, but after a certain point, they would become useless.

Jan 27th : continue to answer the questions above +
Jan 28 - continued to answer the questions above
Jan 29th - science fair meeting at lunch
February 14th - continued questions above.

February 15th - continued to finish questions above
February 16th - continued questions above.
February 17th- finished up everything above.

What diseases might take us out? - used AI to come up with names and such
Necroflu-X
A highly mutating virus similar to influenza and COVID-19 (think if you combined the two and then made it 10 times worse). Since human immune systems remain unchanged, the virus would mutate faster than we could make treatments.
Symptoms:
Begins with mild cold-like symptoms. Within 48 hours it attacks the nervous system, causing uncontrollable muscle spasms and hallucinations. Internal bleeding follows as the virus destroys blood vessels, leading to blackened and bruised skin. Death occurs within 3-5 days from massive organ failure and respiratory collapse.
90% fertility rate, the virus spreads through human contact/ bodily fluids.

Ferro Virus
A bacterial infection that feeds on the iron in human blood. Also affects animals, but that's very minimal. Without biological adaptations, humans cannot develop immunity, and modern medicine starts to fail
symptoms
Initially presents itself as mild anemia. Over a few weeks, the bacteria consumes all the iron in a person's red blood cells. The blood in one's body turns into a brown sludgy paste. As oxygen transport collapses, humans may go through strokes or heart attacks, if not, brain damage and organ failure occur. Constant fainting is also noted. The bacteria harder the body, leading to iron deposits that form sharp spiders inside the veins causing them to rupture. Death occurs due to internal ruptures and toxic buildup of iron deposits.

Shorter, more realistic timeline of the humanities collapse

Year 1 - 50. Nothing happens, we stay as we are with a high overall death toll as we struggle to fight new variations of the common cold and different flus.

Year 100 - a new highly mutating virus emerges (necroflu-x pandemic). Since humans no longer evolve, our immune systems fail to adapt, making recovery slow. Death tolls skyrocket as hundreds of thousands of people die each day. Civilization recovery with much difficulty. Global population drops by 35-40%, waking economies and infrastructures.

Year 200 - ferro virus (iron consuming bacteria) appears, starting as an epidemic then slowly spreading worldwide. Medical science struggles as our immune system cannot naturally evolve resistance, vaccines are useless, and antibiotics lead to antibiotic resistance. High fatality rates (another 50 -70% of the remaining population gets wiped out). Major cities shrink even more as people migrate to isolated rural areas to avoid infection. Mini ‘wars’ (apocalypse style, everyone fends for themselves) break out within neighbor booths as food runs low (animals are infected so there's no meat, farmers struggle to grow crops.

Year 250: still no solution to the previous two outbreaks, other than antibiotics, people suffer as the disease develops antibiotic resistance. Cities become abandoned and our reliance on AI, and robots grows as we start to genetically modify many of our plants. Humans think about genetically modifying themselves to get by, an ethical debate arises. Infrastructure begins crumbling. Global supply chains start to collapse (the population is decreasing, who do they sell to, think covid 19 isolation period has been going on for 50 years now). Many animals have started to develop resistance to this disease, most people are fearful to go back to consuming meat, others eat without a worry.

Year 300: we decide to continue with human gene modification, but due to our limited intelligence we are only able to do so much. However, we can grant ourselves disease resistance, though none of these modifications are inheritable (because we cannot evolve, and if they were heritable then it would mean that we are evolving)

Year 400: we would continue to rely on gene modification, but as new diseases spread, and with the population continuously shrinking, we wouldn't be able to make it for long and will go extinct in the next decade or so.

Timeframe	If Humans Continue Evolving	If Humans Stop Evolving
100 Years	Humans survive pandemics with new immunity.	First major diseases wipe out billions.

500 Years	Civilization advances; new technology emerges.	Infrastructure collapses; population drops drastically.
1000 Years	Humans may look different due to continued evolution.	Humans exist in scattered, primitive societies.
5000 Years	Space travel, transhumanism, or even genetic engineering emerge.	Humanity is extinct; Earth returns to a pre-human state.

What would make humanity stop evolving?
Perfect genetic engineering - we could eliminate random mutations and select only specific genes for reproduction. Technologies that allow us to do this could allow for perfectly designed offspring, meaning natural selection and genetic drift would no longer shape human evolution.

A catastrophic event. Like a nuclear war, engineering disease or steroid impact will reduce humanity to a small isolated population with very little genetic diversity, evolution. This would slow evolution down drastically, if the remaining population was genetically identical or had a very low mutation rate, evolutionary changes could effectively halt,

Uploading minds into machines. If humans fully transitioned into digital or artificial lifeforms, biological life would become irrelevant, instead, changes would be made to software and such.

March 12 - science fair meeting

March 15th: homo stagnatus: the end of evolution?

How does the continued evolution of humans impact survival, and what will happen if human evolution stopped
Manipulated variable: continuation vs cessation of human evolution
Controlled carabids: environmental conditions, disease presence, technological advancement (to an extent)
Responding variables: immune system adaptation, intelligence development, ability to survive changing environments

Method: We first researched and analyzed how evolution has contributed to human survival thus far. After this, we modelled two scenarios.
First, human evolution continues.s
Second, human evolution stops.
After this, we investigated how a lack of evolutionary adaptation would impact the immune system, and using the current evolutionary trends, we predicted future human development under both stagnation and continued evolution,

Table: Comparison of Future Human Adaptability

Time Frame	Continued Evolution Outcome	Stagnation Outcome
100 Years	Improved immunity, minor physical changes	Dependence on medical advancements, weakened immunity
1,000 Years	Climate-adapted traits, resistance to new diseases	Rising genetic disorders, reliance on artificial enhancements
10,000 Years	Divergence into subspecies, advanced intelligence	Increased vulnerability to disasters, possible extinction

T-Chart: Evolutionary Impact vs. Stagnation

Factor	Evolution Continues	Evolution Stops
Disease Resistance	Increases over time	Decreases, more epidemics
Intelligence	Advances with adaptation	Stagnates, reliance on tech
Physical Adaptability	Adjusts to climate and diet	Becomes vulnerable
Genetic Health	Improved diversity	Higher rates of disorders
Long-term Survival	Higher probability	Potential extinction risk

Overall, our research suggests that human evolution plays a critical role in survival by allowing us to adapt. If evolution stops, humans will become increasingly vulnerable to disease,

environmental shifts and competition from still evolving species. The reliance on medical and technological advancement compensates for the loss of adaptation for a short amount of time, but long-term survival without evolution is highly unlikely. Over a millennium stagnation may lead to genetic degradation, rising infertility rates and eventual extinction. All in all, evolution remains necessary for human survival and progress.

Graph: Intelligence Over Time (IQ or Cognitive Ability Score)

- X-axis: Time (Millions of Years) [0, 50, 100, 150, 200]
- Y-axis: Intelligence Score (arbitrary scale) [50, 60, 75, 90, 110] for continued evolution; [50, 52, 53, 54, 55] for stagnation

Graph: Disease Resistance Over Time (Immune System Efficiency %)

- X-axis: Time (Millions of Years) [0, 50, 100, 150, 200]
- Y-axis: Disease Resistance (%) [60, 70, 85, 95, 99] for continued evolution; [60, 58, 55, 50, 45] for stagnation

Graph: Environmental Adaptability (Survivability in Different Climates)

- X-axis: Time (Millions of Years) [0, 50, 100, 150, 200]
- Y-axis: Adaptability Score (arbitrary scale) [40, 55, 70, 85, 100] for continued evolution; [40, 38, 35, 30, 25] for stagnation

How does evolutionary stagnation impact intelligence over time?
Without evolutionary pressure, human intelligence would decline. Genetic mutations that enhance cognitive function wouldn't be a thing anymore, meaning that we would either have the same amount of intelligence or our intelligence level would decline. This is because the genetic mutations that enhance cognitive abilities wouldn't be selected (as mutations don't long exist), leading to reduced problem-solving abilities and adaptability in changing environments.
What is continued evolution necessary for disease resistance?
Pathogens evolve rapidly, developing new ways to bypass immune defences. Without evolution, humans would become increasingly vulnerable to diseases as our immune system would fail to adapt to new threats, this would lead to widespread pandemics.
How does evolution contribute to human adaptability in different environments?
Evolution allows humans to develop beneficial traits (e.g., increased melanin for UV protection, higher lung capacity for high-altitude living). Without this, human populations would struggle to survive in changing climates, leading to mass displacement or extinction.
Could technological advancements compensate for the lack of biological evolution?
While technology might be able to help for a short period of time (vaccines for disease, AI for intelligence) it cannot replace evolution, over reliance on technology may also create vulnerabilities as, if technology were to hail humanity would have no natural defences.

What evidence suggests that continued evolution is necessary for long-term survival?
The fossil records. Species that failed to evolve (the dodo, dinosaurs, wooly mammoth, Caspian tigers, Tasmanian tigers, etc.) when environments changed due. On the other hand, species that did evolve were able to live longer.