

DIVERSITY, EQUITY, AND INCLUSION (DEI) QUOTIENT IN THE AGE OF CRISPR-CAS9: A SPECULATIVE SPECTRUM OF ARGUMENTATION

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Abstract

The advent of CRISPR-Cas9 gene-editing technology has sparked a complex discourse on diversity, equity, and inclusion (DEI). While it could potentially eradicate genetic disorders affecting marginalized groups, concerns arise regarding ethical implications, eugenics, exacerbating biases, and socioeconomic divides. One salient aspect of this discourse pertains to the ethical considerations surrounding using CRISPR-Cas9 for germline editing, which could theoretically eradicate genetic disorders disproportionately affecting specific populations. Proponents argue it could foster inclusivity through personalized therapies for underrepresented populations, though met with skepticism. This revolutionary tool necessitates critically examining its ethical, socioeconomic, and governance ramifications.

Keywords

CRISPR-Cas9, Germline editing, Bioethics, Diversity, Eugenics

Of all the technological breakthroughs, none can profoundly impact all areas of human life, such as CRISPR-Cas9 technology. This technology has appeared to be the pride and prejudice of genetic engineering; it dislikes being confined to genetic engineering only because its eventual discovery was hastened by various developments in the research conducted in the fields aplenty: Biomedicine, biochemistry, molecular biology, and name just a few. Successive contributions to genetic engineering over the long period ultimately yielded CRISPR-Cas9, which stands for ‘Clustered Regularly Interspaced Short Palindromic Repeats’ (Nidhi et al., 2021). To say just that this technology has impacted all spheres of human actions and reflection is to be unable to plumb the depth of human capacity to experiment with Nature’s edict and to play God (Isaacson, 2021). Human culture and all dimensions of human existence are far from immune to CRISPR-Cas9’s far-reaching repercussions. As a gene-editing technology, CRISPR-Cas9 has empowered people to make a kaleidoscopic conquest of destiny and fate humans are subjected to by Nature or God. The following image taken from ‘Getty Images’ is visually illuminating enough to present CRISPR in a moment of editorial operation:



Fig (1)

The mystery of human life is as old as it is new. The biochemical makeup of human beings has been engaging creative brains in posing several questions about its operationalization, identifying problems germane to it, and then proposing different solutions to the problems they figured out. Since the time of Aristotle, inquisitive minds have been reflecting on the mechanisms through which traits and attributes of humanness get transferred to generations to come (Vinci and Robert, 2005). Gregor Mendel’s experiment with peas marked the beginning of a systematic study of this mechanism, and this spirit of experimentation achieved its full-blown manifestation when James Watson and Francis Creek discovered the double-helix shape of human DNA (Harbs, 2013). This discovery of the double-helix structure of DNA added

sophistication to the study of the underlying human mechanisms through which parents' qualities, attributes, and traits transfer into their children, thereby forging a solid identity in the discipline of genetic engineering.

At the turn of the last century, the Human Genome Project took the entire world by storm with its success in the interpretation of genetic code by cracking genetic code, sequencing genomes, and enabling genetic engineering to augment the momentum for attaining additional breakthroughs via pushing forward the frontiers of biochemistry, biomedicine, genetic engineering, and molecular biology as well (Gibbs, 2020). In this race of ushering in momentous breakthroughs with far-reaching repercussions, Jennifer Doudna and Emmanuel Charpentier—recipients of the Nobel prize for their joint contributions to the invention of CRISPR-Cas9 technology of gene editing in 2019—came up with the most innovative technology of CRISPR-Cas9—a molecular marvel—which brought forth a seismic shift in the erstwhile genetic outlook on what constitutes the molecular base of life, and how life could be emulated and aggrandized by playing with the molecular makeup of life (Isaacson, 2021). When a cutting-edge tool, CRISPR, catapulted itself into visibility, many biohackers, researchers, and gene-editors conducted many experiments, leading to promising prospects and perils. The redemption of the challenge-ridden present from the limit of Nature and the promises and perils accruing from CRISPR-Cas9 jointly constituted an axis around which moved countless numbers of fresh conversations about our culture industry, ethics, norms and mores, political-economy, defense system, identity politics, and the Hollywood. The Hollywood film *Rampage* is enough to show how much the furor and frenzy unleashed by the discovery of CRISPR-Cas9 alarmed the public imagination.

CRISPR-Cas9 gene editing technology enabled gene editors to delete defective genes from reproductive cells even in an embryonic stage. Those who undertake the editorial task of genome editing play with molecules, targeting faulty genes, and cellular viruses that cause genetic mutations, and defective DNA that trigger congenital, hereditary, and incurable diseases: Sickle cell anemia, Huntington's disease, Alzheimer's, Autism, and to name just a few (Isaacson, 2021). Deleting the defective part of a gene with the help of a specific molecule that facilitates the targeted deletion has proved and will continue to prove to be a hitherto unimagined boon and blessing of science on those who have been struggling with their incurable, hereditary, and congenital diseases, which justifies Francis Bacon's perspective on science: to bring relief in men's state—a control over nature rather than an acquisition of abstract metaphysical insight (as cited in Hesiod, 2018). Now that the crucial contribution of CRISPR technology is evident, let's turn to its impact on various types of culture, nature, ethics, and political economy. So far, it has become a truism that the territories of normative human values, practices, and perspectives will likely undergo deterritorialization with the discovery of each ground-breaking technology—better to dub it epoch-making. This is perfectly true in the case of CRISPR, the throbbing heart of biochemistry and genetic engineering (Pak, 2014). With the application of CRISPR, the landscape of humanity, ethics, nature, and political economy witnessed controversies aplenty.

Though CRISPR has not been affordable and accessible to people, some of the cases of its regulated and unregulated applications have already generated controversial entanglements. In China, He Jiankui, a biotech entrepreneur and expert on applying CRISPR-Cas9 technology, became successful in getting CRISPR-edited twin babies born from an HIV-positive husband and an HIV-negative wife (Isaacson, 2021). This successful but contentious stroke of success happened in 2018; by that time, an internationally accepted regulatory regime on the application of CRISPR had already been announced, and it was steadily obeyed by many countries who signed off on the document of CRISPR-Cas9 application policies and protocols. Jiankui's act of biohacking and producing CRISPR-edited twin babies was deemed to be a flagrant defiance of the regulatory mandate, which led to his imprisonment in China (Johnston, 2019). Though some Chinese media touted Jiankui's success as a glorious masterstroke accomplished by a Chinese scientist, the government of China announced its final official decision to imprison Jiankui for desecrating what Antoine Danchin (2017) called the Holy Grail of genetic engineering.

The controversy related to Jiankui made urgent and imminent productive conversations about what conditions the application of CRISPR-Cas9 be sanctioned. Furthermore, central to these conversations are twin questions: How do we determine who can capitalize on opportunities furnished by this gene-editing technology, and what differentiates the uses and abuses of the CRISPR-Cas9 technique? The following image cited from the article "The CRISPR-baby Scandal: what's Next for human gene-editing" published by David Cyranoski (2019) in *Nature* is visually illustrative of a shock set off by the bombshell revelation of Jiankui's audacity:



Fig (II)

In parallel to productive conversations as to the internationally sanctioned protocols ringing loud and clear across communities of scientists and entrepreneurial hubs of biotechnology, many conflicting voices from the domains of ethics and bioethics were raised as a counterforce of critical check to the vast benefits which would accrue to humanity at large if CRISPR-Cas9 is applied prudently with insight, forethought and a genuine sense of liberating humanity from the grinding mill of hereditary complications and limits of what human beings have been endowed with from Nature.

If the double-helix structure of DNA is a wave, CRISPR-Cas9 technology is the crest; better still, it is the jewel in the crown of genetic engineering. CRISPR-Cas9 is to genetic engineering what the steam engine was to the Industrial Revolution, what the silicon chip was to the semiconductor industry, and what 5G would be to the fifth Industrial Revolution. The perils and promises spurred by this noblest genetic engineering and biochemistry breakthrough are noticed in their incipient forms, starting from bioethics, diversity, identity, geopolitics, and political economy, to name just a few. In this article, I enumerate one after the other several occasions and cases suggestive of how and why CRISPR gave rise to both perils and promises, constructive momentum and controversial issues, and a bright future and bleak present.

Babbles in Bioethics

The CRISPR-Cas9 genomic engineering triggered a ripple effect in ethics and bioethics, creating a situation in which conversations about right-to-sound health and longevity intersect with ethics. From the field of bioethics, some genuine concerns about an ensuing threat to human dignity and integrity of the underlying genetic substratum of an individual undergoing genetic surgery ring louder with their vociferous force of resistance. In conjunction with the ethical dilemma brought forth by this technology, Luis Uriel Gonzalez Avila et al. (2021) write, “Information on the application of the CRISPR Cas-9 system should focus on deeply studying the damages or collateral effects of said system when using it in living beings, and growing interest in the use and application of CRISPR-Cas for genetic modification, the scientific community is often in ethical dilemmas...” (p. 4). The CRISPR revolution set the stage for genetic modification; it became a much-debated topic in bioethics, which set off a question: should genetic modification be allowed in humans to enhance their physical, physiological, and mental capacities? Bioethical communities raised eyebrows about the chance of “exceeding the limit of biology” (Luis et al., 2021, p. 5). In addition, the bioethical community expressed its fear as to an overweening sense of biohackers who crazily tended to climb the genetic bandwagon, subscribing to the conviction that “pharmaceutical companies are enhanced by the development of techniques that could be performed at home without any problems, without clinical control, and medical supervision, in addition to the affordable cost” (Luis et al., 2021, p. 5). Stated

simply, dignity, integrity, and the question of commitment to life, in general, should not be defied in the name of harnessing all that accrues to those who are subjected to CRISPR intervention in the faulty part of DNA.

In his famous book *The Code Breaker*, Walter Isaacson (2021) proposes “The Germline as a red line” (336), which means that conducting genetic modification for the enhancement of what Nature has bestowed upon us is tantamount to crossing the red line—crossing the Rubicon. According to him, the application of this molecular technique for deleting defective parts, which cause congenital and hereditary diseases from DNA structure, needs to be treated as sacrosanct. Jiankui’s impudent act of crossing the redline—the germline—and the creation of CRISPR-edited twin babies in China, and the aftermaths that followed are enough to display the extent to which unregulated and unguided application of this molecular breakthrough technology could set off far-reaching ethical repercussions.

The bioethical issue is not limited to just the case discussed above. Notably, the environment, animal welfare, and dignity would be at risk because of the growing application of CRISPR-Cas9. Quite an incredible number of scholars studying how CRISPR-Cas9’s application in animals jeopardizes animal welfare and dignity have already given an inkling, alerting bioethical communities worldwide. According to T. Ishii (2017), M. Schultz-Bergin (2017), and N. De Graeff et al. (2019), animals are likely to develop diseases and unprecedented side effects which would certainly harm animal welfare and dignity owing to off-target mutations in the genome, (as cited in Ayanoglu, 2020). So, pressures were mounted on the concerned authority to put a moratorium on an unregulated application of this genome-editing technique in animals. Those who apply CRISPR-Cas9 in animals are less predisposed to ward off any kind of negative impacts that might accrue from the off-target mutations. Environmentalists and animal rights activists paid serious attention to these looming perils of abusing the genome-editing tool when applying it to animals.

By far, the most startling example of CRISPR-Cas9’s entanglement with ethical problematics is to be noticed perceptibly in applying this technology to enhance armies’ staying power, disciplinary dedication to military authority, and heroic bent of mind. Though there is no debate about using this revolutionary technique for therapeutic purposes, critically conscious youths could not but grudge against using CRISPR-Cas9 to build a more robust defense system for a country by performing genomic editing on the cellular level of soldiers. An agonizing question has already loomed large over us: how ethically admissible is it to boost armies’ soldiership, strength, and stamina, including their unswerving loyalty to their military duty, via resorting to germline editing? This use of molecular technology to aggrandize the martial spirit of soldiers in the name of patriotism, nationalism, and national defense has ginned up a phalanx of ethical controversies. Intending to redress this issue, Greene and Master (2018) come to terms with the conviction that “it could be difficult to obtain informed consent forms independently without any interaction among individuals due to military training methods, strict norms, and chains of command” (as cited in Ayanoglu et al., p.114). In effect, any nontherapeutic application of the CRISPR-Cas9 technique and any exclusion of informed consent of a person subjected to germline editing is dead set on sparking a series of ethical controversies.

Incipient Onslaught on Diversity

Consequent upon the coinage of ‘genetic supermarket’ by Robert Nozick (1974), a wide range of debates and discussions concerning the possibility of eugenic practice—not on the state level but on an individual level—gained fresh impetus (as cited in Resnik and Vorhaus, 2006). According to what Nozick crystallized in his philosophical imagination, people will visit the genetic supermarkets to determine what kind of gene disposition they want their prospective babies to acquire. There was no genetic supermarket as such when Nozick coined the term, but it clearly indicated a strong possibility of seeing a genetic supermarket around us in decades. From the second decade of the twenty-first century, in which Doudna and Charpentier ushered in a series of breakthroughs via their lab experiments and research, Nozick’s fantasy of a genetic supermarket started reverberating once again not in the zone of utopian fantasy but in the concrete trajectory of reality. Currently, the CRISPR-Cas9 technology, as it were, has not been within the access of people at large, and there is no dramatic increase in the number of genetic supermarket visitors (Roche, 2019). Yet, vigorous conversations about the application of CRISPR-Cas9 have laid the groundwork for a lively fermentation of productive reflections, interactions, presentations, and exchanges of polar opposite thoughts.

Scientists have thus far harbored no reservations against the therapeutic use of CRISPR-Cas9 in treating incurable and hereditary diseases and applying it to non-reproductive somatic cells. Scientists and the concerned legislators are increasingly skeptical about enhancing genetic makeup for access to a higher range of talent, prodigy, mental strength, physical beauty, and any attributes and features. They have also called for formulating internationally accepted laws and ethical frameworks concerning when, how, and why the CRISPR-Cas9 technique will be used for therapeutic beneficence (Choy, 2017). But human rights activists have observed this momentum from a different angle, which in no way implies that they have no regard and respect for the rules and policies on the subject of CRISPR-Cas9’s regulated and normatively sanctioned application in humans and nonhumans alike.

If many people could afford to buy the genetic molecule according to their preferences and if a variety of edited genetic molecules is accessible, those with access and economic affordability to edited genomic makeup could reproduce the babies with an enormously enhanced genetic prototype. Obviously, it is ludicrous to pose this hypothetical situation, yet in the early phase of CRISPR-Cas9's growing application, this seemingly hypothetical scenario has already started making its way. If all women happen to be beautiful with the edited super-genetic molecule, where could we find a diversity of physical comeliness, beauty, and prettiness among women? If most people achieve super-athletic prowess with the affordances granted by genetic supermarkets, won't the value, craze, and athletic cult dwindle to nothing? (Fan, 2021). Granted that many people acquired exceptional talent and temerity with the consumption of amenities and instruction from a genetic supermarket, do people at considerable value revere and lionize those who are talented and super-intelligent? With a widening scale of access to editorial affordances from the genetic supermarket, a flat line of uniformity and homogeneity in the human race arises, shattering to pieces the diversity of people in terms of skin color, intelligence, creativity, beauty, muscular strength, athletic prowess, technical know-how, psychological disposition, and to name just a few.

By designing and manipulating their underlying genetic substratum, hundreds of thousands of people may acquire the same and similar level of strength, the same configuration of beauty, and the same template of talent and temerity. Though this situation has not occurred in a full-blown form till now, symptoms are already on the ground. From one angle, it stands to reason that it would undoubtedly be good to see everyone having the same and similar mental power, physical fitness, muscular might, IQ, psychological makeup, disposition, and uniform talent and traits. Other things remain the same: the human aspiration to raise their genetic power to the miraculous level hardly sounds worthy of rationalization and justification. Crucially, CRISPR-Cas9 funneled the fantasy of "free-market eugenics" (Isaacson, 2021, p. 360) to the public, with an intense possibility of accomplishing a genetic panorama of uniformity, a homogeneous template of talent and temerity and an unparalleled parity of mental, cognitive, and creative power.

Let's imagine a world where most people have acquired the same strength, capacity, creativity, beauty, IQ, cognition, and longevity for clarity's sake. In such a world, does diversity exist? Does it flourish? How could human beings live in a world devoid of diversity? What quandary would humans find themselves in if Nature-bestowed diversity no longer dwells? How would human minds respond to a world destitute of diversity? With uniformity of enhanced mental, psychic, cognitive, and physical faculty, don't people develop mundaneness and monotony? Reflecting on this looming prospect, Isaacson (2021) writes, "Diversity is good not only for society but for our species. Like any species, our evolution and resilience are strengthened by a bit of randomness in the gene pool...As a society, we may feel that it is profoundly beneficial to the community to have people who are short and tall, gay, and straight, placid, and tormented, blind, and sighted" (p. 362). The technology-driven conquest of diversity is in no way good if the power of diversity in rendering human existence effervescent is curtailed substantially.

Liveliness, joy, effervescence, and urges to traverse divides and boundaries set by Nature-bestowed and God-sanctioned logics of diversity expose themselves to a risk of being curtailed, contained, and conquered if the CRISPR-CAS9-fueled eugenic practice is made accessible to people at individual levels. In parallel, another dread of technology becoming increasingly sovereign and agent-like to the extent of a gradual minimization of living organisms is noticed in the post-invention furor by Leah Ceccarelli (2012) who stipulates, "conceiving of technologies as living things might be just as troubling because it takes responsibility away from the people who are using those technologies and places it in the metaphoric hands of the technologies themselves, absolving us of accountability for the acts performed" (p.112). The valorization of technology at the cost of the gradual erosion of the ontological value of living organisms runs counter to the environmental entelechy of deep ecology.

Associated with this assumption of Ceccarelli is the view of Michael J. Sandel, whose perspective on the giftedness of life and Nature-begotten diversities sounds relevant. Any act of harnessing CRISPR for enhancement is not limited to "eroding human agency" (Sandel, 2004, para. 14). In large part, it represents what Sandel (2004) called "a kind of hyper-agency—a Promethean aspiration to remake nature, including human nature, to serve our purpose and satisfy our desires" (para. 14). This fervent drive to exceeding the bounds of Nature, though on the surface it seems to be a miraculous blessing on mankind at large, will bear within itself the pregnant possibility of sabotaging "the gifted character of human powers and achievements" (Sandel, 2004, para. 14). Being successful in one's way on the strength of what one has been endowed with Nature and God has its cachet and charisma, which any level of enhancement would never rival through germline editing. Endless debates on 'playing God,' including diversity at the mercy of CRISPR-Cas9, have gathered endless momentum amid this molecular marvel's far-reaching repercussions.

Equity and Inclusion in the Age of CRISPR-Cas9

Equity and inclusion have been the heartbeat of every American system that acts on the all-encompassing spirit. Almost all institutional and organizational places are always committed to keeping the principles of equity and inclusion intact. Speaking metaphorically, fairness is a feather in the cap of America. With the discovery of CRISPR-Cas9, conversations about how this cutting-edge technology could affect the existing perspective on and the practice of equity and inclusion. Since CRISPR-Cas9 has been patented, it won't be accessible to all. Those who want to buy edited genetic molecules of their preferences must buy from a genetic supermarket, paying an exorbitant price. Only those with sound financial strength could buy enhanced genetic molecules for their prospective offspring. The rest of the people won't have access to the genetic structure of their children enhanced beyond belief. Coterminous with this scenario is the view expressed by Jorge L. Contreras and Jacob S. Sherkow (2017): "Although this model, in which a university effectively outsources the licensing and commercialization of a valuable patent portfolio to a private company, is not uncommon in university technology transfer, it could rapidly bottleneck the use of CRISPR technology to discover and develop useful human therapeutics (P. 698). In effect, even people from the standard walk of life would clearly see a handful of people with access to genetic supermarkets stretching the realm of their influence, power, control, social standing, and economic might, whereas the rest of the people devoid of any economic strength and access will be bound to remain dependent on their nature-given genetic makeup. If this sort of lopsided situation looms large, and if a glaring lacuna widens between people who could afford to leverage amenities furnished by genetic supermarkets and people who are at a disadvantage, a blatant crisis in equity will surely break out, touching off a series of agonizing and subversive controversies.

The principle of equity would further be problematized if people with edited and manipulated genetic potency would control decision-making mechanisms, governing bodies, and statecraft. If this situation arises, the already incubating inequality and inequity will worsen into a severe hurdle that could ultimately rip apart the basis of a reasonably administered society. By the same token, married couples will have access to gender-specific genetic molecules, which help them decide what would be the gender of the baby they reproduce. In the case of traditional society, where men are privileged, and women are relatively deprived and discouraged, available genetic molecules designed to decide the gender identity of a baby to be born should spur an already brewing crisis of gender discrimination. This is a typical incipient case regarding how CRISPR-Cas9 will aggravate the already not-so-good landscape of conversations about gender and sex.

Simultaneously, the principle of equity still holds the prospect of being languished if CRISPR-Cas9 technology is used to enhance the martial spirit of armies. It is customary for every country to strengthen and fortify its defense system; in addition, achieving this purpose of bolstering national security and defense by utilizing optimally the available sources is in no way wrong (Morial Shah, 2019). Working toward strengthening national defense by manipulating the underlying genomic structures of armies is also downright hazardous and morally inadmissible. If one country builds invincible armies by optimally leveraging CRISPR-Cas9 technology, what would be the fate and future of other countries that cannot harness the leading edge of genetic engineering due to inaccessibility and unaffordability?

The practice of inclusion, on which so much hope has been pinned as a crest of civilized society, won't remain insulated from the repercussions of CRISPR-Cas9, which intersects with the issues of human rights and identity. It is not questionable if people with incurable ailments should undergo editorial intervention in their genetic code to enjoy good health. The spirit of the international consensus and ethical guidelines on applying CRISPR-Cas9 does not conflict with the preference of people with congenital ailments (Seok et al., 2021). In a way, they have a right to enjoy all the affordances of CRISPR-Cas9. After all, the liberation from congenital, hereditary, chronic, and incurable diseases is everyone's liking; it is humane to see ailments-ridden people as becoming vigorous and healthy. However, this does not mean everyone likes to undergo genetic manipulation, even if the outcome would be beneficial.

What happens if a couple falling under the category of LGBTQ insists that they do not want to have their baby with a genetic component that will ensure the heterosexual orientation of their babies? If argued from one angle, wedded LGBTQ couples wield a right to expect the continuity of their identity even in their children. But here, too, a question arises— what rights do parents have to decide the identity of their children? If they cherish this fantasy and push hard on their perspective, does it not seem like aggression? How do we tackle the issue related to a blind couple who disdains any attempt to make their babies look different from themselves? Should we interpret it as an assertion of their right to give continuity to their identity through their babies? Or ought we to deem it as an intervention in their children's fate, identity, and potentiality? Under these conditions, the practice of inclusion will surely face unprecedented hurdles if diversity, ethics, identity, and inclusion risk collision, collusion, and confrontation with a widening scope of CRISPR-Cas9, culture, our existing and erstwhile societal practice, and various other normative frameworks would show symptoms of being on the verge of destabilization, disintegration, and in worst case scenario dilapidation.

CRISPR-Cas9 in the Landscape of Patent Capitalism

Cut-throat competition to invent the CRISPR-Cas9 gene editing technology affected intellectual property rights and patent culture. The competition between Feng Zhang from the Broad Institute and Jennifer Doudna at the University of California, Berkeley, grew so harsh that their respective claims to the patent right of CRISPR-Cas9 reached the court (Isaacson, 2021). Even the court had to spend a great deal of time researching who truly deserves the patent right of the CRISPR-Cas9. The following extract highlights how the competition between Zhang and Doudna morphed into an intense rivalry and then into an open expression of disgruntled attitude to the decision of the U.S. Patent and Trademark Office to grant the patent right to the Broad:

The U.S. Patent and Trademark Office issued several CRISPR-related patents to Broad in 2014, sparking a legal battle in 2016 based on CVC claims of patent ‘interference.’ That led to a first PTAB trial, which seemed to deliver a mixed verdict, ruling that the eukaryotic CRISPR and other uses of the genome editor were separate inventions, patentable by Broad and CVC, respectively. Unsatisfied, CVC took the issue to a federal court, which denied its appeal. (Cohen, 2020, para. 4)

Collaboration, cooperation, mentoring, and exchange of ideas have been hailed as the potent keys to developing new ideas, fresh perspectives, and ground-breaking thoughts. Research labs, experimental places, and seminar halls at American universities have become ideal sites for generating a relentless push toward discovering new ideas, concepts, and thoughts. Science, research, and inquiry fructify profusely in tandem with the spirit and entelechy of collaboration. But among the topmost geniuses and researchers in science has developed an intense competition to win the Nobel prize or any kind of impressive award and recognition, which sometimes tends to make the foundation of collaboration and cooperation somewhat shaky.

Competition is not destructive; it is a locomotive for discovery and innovation. However, if misunderstanding, fear of being deprived of one’s genuine right to recognition, and other ordeals such as confusion, envy, egocentrism, horrendous hunger for the limelight, media coverage, and ego-gratification are not managed on time smartly, and proactively, the vibrant culture of research and inquiry begins to languish, crippling additionally any prospect for widespread collaboration (Hara et al., 2003). This is precisely what happened in the hectic competition between Zhang and Doudna. In the race to get her paper published in the journal, both the genius giants did antics like urging the journal editor to push peer reviewers to peer review their paper drafts so that they would get current research published.

Scientific research is funded by the money granted by the federal and state governments, and the money comes from taxes paid by the public. Therefore, it is believed that scientific discoveries and innovations must be deployed for the public good. The public must taste the fruits yielded by research underwritten by the money from taxes paid by the public (Boulton, 2021). This view has been held deeply by millions of people who believe in the redemptive power of science; the operation of which is funded by the economic contributions of the public, which comes through various taxes, they would pay to local, state-level, and federal governments. While the public keeps cherishing this fantasy of the public good, patent capitalism has inserted its tentacle of rapacity into the research culture, innovation practice, and inquiry-fueling system. That is why scientists and researchers, inching closer to discovery, rush to get their papers published, to get the patent right, and to obtain hype and limelight.

The open legal fight for the patent rights of CRISPR-Cas9—between Doudna and Zhang—is a classic example of corporate patent culture infiltrating the sanctum of research, experiment, innovation, and inquiry (Isaacson, 2021). It also showcases collaboration in the wild, inquiry in its bizarre form, and innovative spirit in isolation. In line with this languishing culture of inquiry and collaboration, efforts have been made to keep the principle of collaboration intact in the name of legal intervention or by reminding the disgruntled researchers of their responsibility to the proliferation of the noble cause of the public good. By contrast, this advancement of patent culture and its concomitant consequentiality have downsides and promising prospects.

Creating an alignment between patent capitalism and university research has benefits. When Stanford University introduced the practice of aligning university research with patent culture and corporate capitalism, many Ivy League universities raised their eyebrows. Over time, Stanford University garnered many accolades, achievements, and prosperity; thereafter, other universities, including the Ivy League universities, followed in the footsteps of Stanford University (Munch, 2014). Setting up an equation between academic, experimental, and pragmatic research, and patent Entrepreneurship and corporate capitalism stimulate creativity, ignite innovation, and accelerate research.

Put reductively, CRISPR-Cas9 is the sort of technology whose impacts and repercussions have traversed from the humanities, culture, and society to biotechnology, diversity, human rights, identity, and entrepreneurial capitalism. No technology has been discovered so far that has caused such a seismic shift in every practice, principle, and protocol human beings have developed.

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