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## 10 Do Trans/Humanists Dream of Electric Tits? CRISPR and Transgender Bioethics

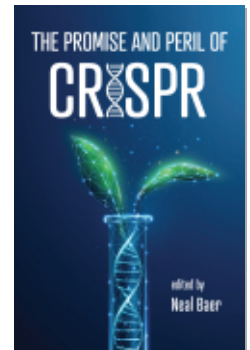
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## Do Trans/Humanists Dream of Electric Tits?

### CRISPR and Transgender Bioethics

Florence Ashley

“Splice me, pharma daddy!”

—Ada-Rhodes Short, PhD

Whether it is titillating or fraught to bring CRISPR to bear on transgender life depends on one’s beliefs about the value of transness and whether it is biological in nature. For individuals who believe that transness is a genetic phenomenon or due to exposure to prenatal hormones, CRISPR may lie uncomfortably close to correcting so-called genetic errors with the promise of high-tech conversion practices. For those who, like me, believe that gender identity emerges from an intricate interlacing of disparate factors, none uniquely identifiable in making us who we are, our fears about CRISPR may fall by the wayside as we begin to dream of high-tech customized hormonal therapies.

The bioethical implications of CRISPR for trans people turn on the relative likelihood and (un)desirability of the two scenarios. I will consider each in turn before offering some reflections on the hazards of trans/humanist dreams. Rather than offering definitive bioethical conclusions, I approach the topic in an exploratory mood, mapping out issues and possibilities that should be kept in mind when thinking about the ethics of CRISPR in relation to trans communities.

#### **CRISPR as High-Tech Conversion Practice**

Conversion practitioners have long deployed medical knowledge and technologies to undermine trans and queer existence. By conversion practices, I am referring to a wide variety of sustained efforts to change, discourage, or repress people’s gender identity, gender expression, or sexual

orientation, including attempts to prevent people from being or growing up to be trans or queer (Ashley 2021, 2022). Licensed and unlicensed professionals have used electroshock therapies, lobotomies, and hormonal treatments to bring patients into the cisheteronormative fold—sometimes with their consent, sometimes not—all-too-often with disastrous results (Green et al. 2020; Madrigal-Borloz 2020). While trans conversion practices are opposed by countless reputable professional associations, recent years have seen a surge of scientific and lay ideologues gesturing toward or outright promoting a revival of such trans-hostile practices. Conjuring a moral panic, proponents of conversion practices are portraying youth as confused subjects of social contagion who falsely believe themselves trans as an easy solution to their trauma or internalized homophobia and misogyny (Ashley 2019, 2020). Although unfounded, these claims have enjoyed significant acceptance and promotion by conservative lawmakers (McGuire 2021).

There is little doubt that some people would enthusiastically use CRISPR on zygotes, germ cells, or somatic cells to prevent others from growing up trans or to change their gender identity once it develops. It is unclear whether existing legal bans on conversion practices would cover all such uses of CRISPR and, more gravely, conversion practices remain both legal and common throughout most of the world. The easy access to CRISPR only heightens the risk that it will be used to eradicate trans existence if possible. This concern brings me to two questions: is it likely to succeed and would that be bad? My answers are respectively no and yes.

Many scientists appear to believe that we will one day identify genetic or hormonal causes for being trans (Graves 2019). Etiological research is profitable, and numerous teams have secured funding to identify a “trans gene,” corroborate the existence of a “trans brain,” or hypothesize about the influence of prenatal hormones on gender identity (Austrian Science Fund grant P23021; German Science Foundation grant HA 3202/7-3; and NIH grants 1R01HD087712 and 5R01HD087712). Such studies are often conducted under the altruistic, albeit naïve, belief that proving the biological foundations of transness would lead to greater social acceptance and secure legal rights tied to immutability (Diamond and Rosky 2016; Schüklenk et al. 1997). Rehashing earlier debates about the “gay gene,” many trans scholars and scientists have opposed these research programs as misguided, wasteful, and dangerous and criticized their binary and gender essentialist assumptions (Caselles 2018; Mulkey 2021; Schüklenk et al. 1997). For those committed to intragen-

der diversity and the nonbinary nature of gender, these studies can be quite suffocating. Even under the best of lights, they carry all the trappings of protoeugenics.

Despite decades of research, strong candidates for the gay gene or trans gene have remained elusive. While such genetic studies attract significant attention, they can be prone to false positives when using the conventional significance threshold of  $\alpha=0.05$ , due to the sheer size of the human genome. As the replication crisis in many disciplines teaches us, statistically significant results can and do occur by chance. And even if we set aside the multiple comparisons problem in whole-genome and whole-exome research, reported genetic influences on gay or trans identity appear minuscule. From a practical standpoint, these genetic contributions are far from the necessary or sufficient conditions that would effectively power high-tech conversion practices. For example, a recent study on hormone-signaling genes found that trans women were far more likely to have a particular genotype of a specific gene ( $p=0.009$ ), yet only 37.4% of the trans women had it compared to 26.6% of the cis men (Foreman et al. 2019). Polygenic models may fare better at predicting transness (Polderman et al. 2018), but their success remains highly speculative, and the risks known and unknown of using CRISPR sharply increase as more genes are targeted. Moreover, there is no guarantee that editing genes after substantial fetal development, birth, or infancy would succeed in altering or preventing gender identity, even if genetic causes could be narrowly isolated (Arnold and Chen 2009; Levine and Mullins 1964; McCarthy et al. 2009). If trans genes could be identified, their role in development could well be irreversible. Acting on prenatal hormones might be more feasible, but unlikely to be any more fruitful. Studies on prenatal hormones, often done by comparing finger lengths—perhaps my childhood bullies were onto something—fare little better (Sadr et al. 2020). In any case, the role CRISPR could play in relation to prenatal hormones is not evident—altering parental genes, perhaps?

While many people would certainly like to use CRISPR as a high-tech trans conversion practice—and some will likely do so regardless of effectiveness—its successful deployment toward that goal strikes me as implausible. If gender identity emerges from the irreducibly complex interactions of genetic, hormonal, environmental, social, and psychological factors, as I believe it does, then the most conversion practitioners can hope for is perhaps a few percent fewer trans folks—which could just as easily

backfire given the intractable opacity of causal influences. But just in case of misuse, we should stop funding studies into the origins of transness. There are better uses for the money.

Regardless of plausibility, CRISPR raises important ethical questions about what makes trans conversion practices ignoble (Earp, Sandberg, and Savulescu 2014). Much advocacy against conversion practices has emphasized the psychological harm of attempting to prevent children from growing up trans or attempting to change their gender identity once developed. This harm is often narratively linked to biological accounts of gender identity, although not always. Just because a car's direction is not fixed does not mean you can safely make it change lanes by ramming into it. CRISPR, however, conjures the specter of psychologically harmless conversion practices. If gender identity is genetic and we can change genes, it might be possible to turn a trans person cisgender without any negative psychological consequences. The possibility is only theoretical. Genetic brain changes and alterations to someone's sense of self could very well cause physiological and/or psychological harm. But, assuming harmlessness, would it still be unethical?

I may be biased as a transfeminine person, but I would answer that yes, it would still be unethical. While conversion practices are agents of untold harm for those subjected to them, they also perpetuate dehumanizing and degrading ideologies toward trans communities writ large. Knowing the extent of others' hatred toward your very existence is a heavy load to carry (Verrelli et al. 2019). In a world that devalues trans lives, where trans people face horrendous stigma, harassment, discrimination, and violence, and where over a third of trans people attempt suicide (James et al. 2016), I cannot fathom tolerating practices that try to prevent people from being trans or seek to eliminate us from society. Is that not, after all, what lies at the heart of the immorality of eugenics? Not just harm—although harm indeed—but inequality and dehumanization. Harm, not just to the individual, but to the very moral fabric of society.

### **CRISPR as High-Tech Medical Transition**

Would it not be great to eschew hormone therapy in favor of CRISPR-induced endogenous hormone production? Instead of my daily cocktail of estrogen and progesterone pills, a little bit of gene editing and my body would rev up the production of all the hormones my genetic makeup long denied me. The prospect is certainly appealing—maybe enough for me to ignore that little voice in my head whispering that we should not be so pressed to play

God, and have we not learned anything from Icarus (Ledford 2020) or Lexi (Peters 2017)?

Transition is never as easy nor as effective as we want it to be. For trans communities, the use of CRISPR on somatic cells beckons a vague and elusive dream of ease. Precisely because clinical uses of CRISPR seem so distant, its possibilities seem endless. Not only could it facilitate hormone-related care by replacing pills and injections with endogenous production, but it offers the promise of customization. In surgery, gene editing could potentially be used to prevent visible scarring, alter tissue type (for instance, changing skin into mucous membrane), and grow tissue and organs for xenotransplantation (Roh, Li, and Liao 2018). Personalized hormone regimens are still largely unknown in trans health care, with microdosing estrogen and testosterone still in their infancy outside of do-it-yourself spheres. While dosage can alter the effects of hormones, it is not yet possible to pick-and-choose results and some would like to change their bodies in ways that transcend what hormones allow. For many trans people, no available transition-related medical intervention lets them change what they want about their bodies (Galupo, Pulice-Farrow, and Pehl 2021; Vincent 2019). If you want your voice to drop on testosterone, you must accept clitoral and beard growth. But with CRISPR? Maybe not. For instance, clitoral and beard growth could potentially be inhibited by developing techniques that localize hormone uptake or production or, more likely, by acting on genes specific to pilosity or clitoral development.

Trans health has historically been stuck in a binary model that casts medical transition as a movement toward male and female bodies, denying non-binary identities or rendering them liminal (Bradford and Syed 2019; Riggs et al. 2019; Vipond 2015). Customizability breaks free of bodily bimodality, throwing wide open the door to medical androgenization and the proliferation of gender possibilities. At the same time, customization has the potential to further undermine the cis-trans distinction as people understood to be cis-gender pursue medical interventions long interwoven with our cultural understandings of transness. Would some cis women not want lower voices, more facial hair, or larger clitorises? Would some cis men not want softer skin, thinner body hair, different orgasms, or breast tissue? CRISPR also holds the potential of blurring the line between gender and trans-species technologies (Weaver 2014). With feline traits socially coded as feminine, would CRISPR create a possibility for whiskers? (This one is for the cat girls, cat boys, and all other cat friends.) And if we understand tattoos and

piercings as opportunities to express our gender, why would bioluminescent breasts not also be? Do trans/humanists dream of electric tits?

Dreams of undoing gender may be little more than dreams. As Sara Cohen Shabot (2006) has pointed out, the cyborg of feminist dreams poses a risk of reinforcing the oppressive categories it seeks to destabilize. I have little doubt that doctors will pursue the perfection of binary gender categories long before they develop technologies that pursue androgyny. Current forms of transgender health care are deeply influenced by normative ideals of white femininity and masculinity that supersede the importance of individual bodily goals (Ashley and Ells 2018; Gill-Peterson 2018; Plemons 2019). In a patriarchal world, it is not surprising that reifying rigid gender categories takes precedence over undermining them. Terminator's T-800 (Arnold Schwarzenegger) and T-X (Kristanna Loken) are stark examples of how cyborg gendering can turn out when left to the whims of prevailing social power structures. CRISPR could end up reinforcing the idea that there is something wrong with "looking trans," blaming those who do not wish to blend in with cisnormative society for their own oppression. Dominant ideological systems are often the first to claim the benefits of biotechnological development (Bliss 2015; Mire 2020; Morgan 2011; Riska 2009; Schmitz 2021).

Behind all its speculative grandiosity, CRISPR's greatest appeal for trans lives may be one of distributive justice. In my nonexpert estimate, the most plausible use of CRISPR in trans health is in altering the body's endogenous hormone production. Pulling out my receipts, my estradiol and progesterone pills would cost me around \$CAD 2,000 per year without insurance. Even with insurance, \$CAD 400 per year can be prohibitive given the overwhelming poverty rates in trans communities (Arps et al. 2021). Hormone prescriptions also entail finding and keeping a trusted doctor, taking time off work for appointments, and subjecting yourself to systems of medical gatekeeping and discipline. Unsurprisingly, access to transition-related medical care is highly stratified along socioeconomic and racial lines (Gill-Peterson 2018; Scheim et al. 2017). Social and financial barriers to CRISPR may be far lesser, especially on the do-it-yourself scene (Rotondi et al. 2013), bringing hope of a more egalitarian trans health landscape.

### **Trans/Humanist Dreams, Trans/Humanist Hype**

As I wrote this essay, I butted against my limited knowledge of CRISPR. That ignorance nourished my speculations, turning them into monumental daydreams of gender upheaval. It was all too easy to let myself be

carried away. However appealing, these daydreams are not benign. They create hopes, expectations, and wishes that inform our attitudes toward the world. When writing about CRISPR, we bioethicists should attend to the ethical implications of hype (Caulfield 2016).

CRISPR is hyped. Its possibilities are widely disseminated among the lay population, often through sensationalistic articles that exaggerate the range of clinical possibilities and how close we are to achieving them. CRISPR's prospects are the flying cars of today. We do not know how CRISPR will be usable in the future and whether it will be possible to deploy it as a transition-related medical technology. Its successes might turn out to be far more modest than hoped, as much of our imagination marches on unbound by technoscientific credibility. For trans individuals, speculative nonfiction about gene editing can generate life-sustaining hopes and expectations or create disappointment. Too many trans people have taken their own lives, distraught that they would never reach their embodiment goals. In her suicide note, Leelah Alcorn, a teenager, heartbreakingly wrote: "I'm never going to transition successfully, even when I move out. I'm never going to be happy with the way I look or sound" (Lowder 2014). The hope of technological progress can foster life. It can give hope. It can serve as a future to work toward, energizing current demands for more accessible, personalized trans health care. Yet I have also known trans people who were suicidal because they had cultivated unrealistic expectations and came crashing down as they realized that the expectations were naught more than wishful thinking. Escapism, even without the danger of disappointment, can trap you in a mindset of waiting and prevent you from living your best present. Which way will CRISPR bring people as it strolls down the trans social imaginary?

The hype of CRISPR also impacts trans health clinicians and family members. CRISPR dreams of a normatively gendered future for one's patients or children can reinforce present obliviousness and resistance to the infinite diversity of trans embodiment goals and lives beyond the gender binary. CRISPR's hype may hinder progress in trans health, reinforcing the desire to make trans people and especially trans youth indistinguishable from cis people instead of moving us toward individualized care that centers on patients' desires and self-understanding. In a similar vein, CRISPR may reinvigorate conversion practitioners in their crusade against trans existence.

Predicting scientific futures is difficult. Time and time again, our predictions turn out to be erroneous. I have yet to drive a flying car. Given the underexplored consequences of hype on psychology and society, we should be



more careful when speculating about the potential of CRISPR. Debates around the ethics of using CRISPR, too, can give an impression of immediacy that does not track how far along we are in developing human gene editing. With the clinical deployment of CRISPR still a considerable distance away, we bioethicists should begin by discussing the ethics of hype. Caught in the daydreams of CRISPR's endless possibilities, let us not forget to fight for a better world.

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