Designing a Novel Device for Femoral Socket Preparation in ACL Reconstruction

(Technical Report)

Constraining Omnipotence: How CRISPR Must be Regulated in the Coming Age

(STS Research Paper)

An Undergraduate Thesis Portfolio
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Socio-Technical Synthesis

The technical portion of this research paper aims to reduce the prevalence of primary ACL reconstruction failure by introducing a novel surgical guide that will improve the accuracy of medial portal drilling of the femoral tunnel. The STS portion of this investigation will diverge slightly, focusing on how societies must regulate emerging germline gene-editing technology like CRISPR in the coming decade. It is paramount to consider the human and social dimensions of gene-editing technology as the unprecedented influence over gene expression, vastly accelerating the processes of evolution by millions of years and completely erasing many determinants of social identity. As such, this research will utilize the theory of Procreative Beneficence (PB), the notion that parents maintain the moral obligation to do what is in the best interest of their child, as championed by Julian Savulescu. This paper will perform a case study of Sharon Duschneau and Candy McCullough, a deaf lesbian couple that deliberately created a deaf child by using sperm from a deaf male donor. In doing so, it will identify the given disability and its contribution to the subject's wellbeing, weigh it against other identifiable procreative decisions (financial & emotional status etc.), determine the morality of the choice against a PB backdrop, and extrapolate that determination to include germline considerations. The outcomes of these evaluations will serve as the foundation to construct a model regarding how genetic engineering technology must be regulated in the future. I expect to find a model that supports germline genetic engineering only when used to treat "endogenous" conditions, as defined as disabilities whose mechanisms of action are propagated internally rather than externally. This will allow for a means of restraining "unnecessary" uses of the technology, preventing individuals from changing any characteristic of their child that they perceive to be negative (i.e. citing slightly below average height as a disability). Consequently, this paper will comprehensively and decisively propose a mechanism to restrain the use of technology like CRISPR such that it is not used unethically. Future work will be directed at exploring the intersection of disability, race, and gender, delineating how modulation of gene-editing techniques must consider these determinants of social identity.

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