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The Ethical Limits of CRISPR-Cas9 Germline Editing

The development of CRISPR-Cas9 gene-editing technology has made heritable genetic modification technically feasible in humans for the first time. The 2018 announcement by He Jiankui that he had edited the germline of two human embryos prompted immediate condemnation from scientific bodies including the WHO and the National Academies of Sciences. The ethical response to germline editing has divided into three broad camps: an absolute prohibition position, a moratorium-until-governance-is-established position, and a conditional permission position contingent on rigorous oversight. This essay argues that the conditional permission framework is the only position internally consistent with the ethical principles that the prohibition and moratorium camps themselves invoke, and that the practical case for a permanent ban is weaker than its proponents acknowledge.

The prohibition position rests on a precautionary principle: that heritable genetic modification carries risks of unknown magnitude and that the only responsible response is to prohibit it until those risks are understood. This is a coherent principle in isolation, but the prohibition camp also typically accepts somatic gene editing (modifications to non-heritable cells), as permissible under existing regulatory oversight. The ethical distinction between somatic and germline editing, on the precautionary account, is that germline changes are passed to future generations who cannot consent. However, future generations also cannot consent to heritable diseases that existing technology could prevent. If non-consent is the operative concern, the prohibition position must explain why the non-consent of a future

person to a preventable heritable disease is ethically preferable to the non-consent of a future person to a curative genetic modification; the literature that advances the prohibition position has not resolved this asymmetry (Lander et al., 2019).

The case examined here is not that germline editing is without risk, or that He Jiankui's intervention was ethically acceptable; it was not. The case is that the ethical principles invoked by the prohibition and moratorium camps do not, on close examination, support a permanent ban over a rigorously governed conditional permission framework. The non-consent objection applies symmetrically to preventable heritable disease. The precautionary principle, consistently applied, supports governance development rather than prohibition. The conditional permission framework is the position that takes both concerns seriously without resolving the tension between them by ignoring one side of it.



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