Genetically Modified Babies

by Marcy Darnovsky, The New York Times
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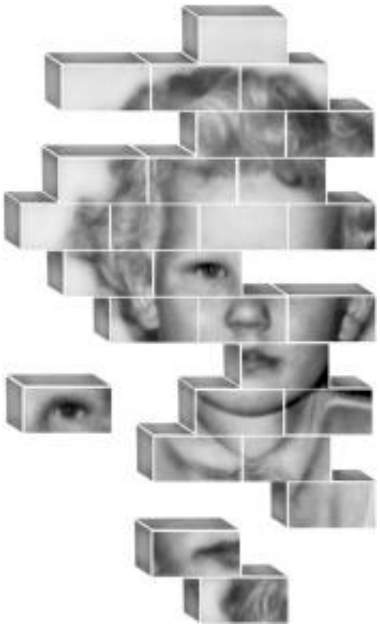

BERKELEY, Calif. — AN advisory committee of the Food and Drug Administration is set to begin two days of meetings tomorrow to consider radical biological procedures that, if successful, would produce genetically modified human beings. This is a dangerous step. These techniques would change every cell in the bodies of children born as a result of their use, and these alterations would be passed down to future generations.

The F.D.A. calls them mitochondrial manipulation technologies. The procedures involve removing the nuclear material either from the egg or embryo of a woman with inheritable mitochondrial disease and inserting it into a healthy egg or embryo of a donor whose own nuclear material has been discarded. Any offspring would carry genetic material from three people — the nuclear DNA of the mother and father, and the mitochondrial DNA of the donor.

Roughly 1,000 to 4,000 children born in the United States each year will develop a mitochondrial disease, most by age 10, with symptoms that can range from mild to devastating. These diseases typically prevent mitochondria from converting food into energy and are the result of genetic abnormalities, although some cases can be caused by exposures to toxins. Disorders caused by mutations in the mitochondrial DNA are passed down from the mother.

Developers of these modification techniques say they are a way for women with mitochondrial disease to give birth to healthy children to whom they are related genetically. Some are also promoting their use for age-related infertility. These are worthy goals. But these procedures are deeply problematic in terms of their medical risks and societal implications. Will the child be born healthy, or will the cellular disruptions created by this eggs-as-Lego-pieces approach lead to problems later on? What about subsequent generations? And how far will we go in our efforts to engineer humans?

These sorts of concerns were first voiced decades ago, well before the human genome had even been “mapped.” Those were the days when our accelerating knowledge about genetics led to over-optimistic hopes for quick fixes to an array of afflictions and grandiose visions of designing genetically enhanced babies to be more intelligent, athletic, musically talented and the like.

More recently, many scholars, scientists and policy makers have urged a different approach: We should carefully and thoughtfully apply the tools of human genetic engineering to treat medical conditions in people, but we should not use them to manipulate the genetic traits of future children. Genetic modifications of sperm, eggs and early embryos should be strictly off limits. Otherwise, we risk venturing into human experimentation and high-tech eugenics.

Unfortunately, there are now worrisome signs that opposition to inheritable genetic modifications, written into law by dozens of countries, according to our count, may be weakening. British regulators are also considering mitochondrial manipulations, and proponents there, like their counterparts in the United States, want to move quickly to clinical trials.

Researchers at Oregon Health and Science University have produced five macaque monkeys using one of these techniques. Four are now adults and all five appear healthy. But we won’t know for years how subsequent generations may be affected.

And the O.H.S.U. researchers themselves report a difference between their experience with the macaques and their work so far on fertilized human eggs. More than half of the human zygotes — single cells formed by the merging of an egg and sperm — had abnormalities not observed in the fertilized eggs of the monkeys. “It looks like human oocytes are more sensitive,” the lead researcher, Shoukhrat Mitalipov, a reproductive biologist, told Nature.

Some media accounts about these techniques have misleadingly referred to “saving lives,” as if they were aimed at people who are sick and suffering. Others have failed to note how very few women would be candidates for even considering them. And they could turn to safer and simpler alternatives. An affected woman could adopt or use in vitro fertilization with another woman’s eggs. Of course, the resulting child would not be genetically related to her, but neither would the child be put at

grave risk by an extreme procedure.

The F.D.A. advisory panel says that its meeting will consider only scientific aspects of mitochondrial manipulation and that any “ethical and social policy issues” are outside its scope. But those are precisely the issues that we must address. Simply being able to do something doesn’t mean we should do it.
