

New test can predict intelligence in embryos

Tom Whipple Science Editor

A tool has been created that can identify embryos at risk of severely low IQ, meaning would-be parents could soon choose to have children through IVF partly on the basis of their intelligence.

The controversial system, at present available only in the US, allows parents to see the genetic “risk scores” for a suite of conditions for each fertilised egg prior to implantation. This means they can choose embryos on the basis of how predisposed each one is to contracting diseases such as breast cancer and diabetes, which are affected by hundreds of genetic variants.

Embryo screening



1 Selection of eggs are fertilised and frozen, in preparation for implantation



2 Before implantation, they are tested for a suite of diseases, including intellectual disabilities



3 Parents can select the embryo with their preferred “risk score”

However, the tool has been criticised over its promise to also screen embryos for “intellectual disability”. By looking at a range of genes that have recently been associated with academic achievement the company, Genomic Prediction, says it can warn parents about embryos with a very low score.

The same technology could in theory allow parents to choose embryos that have a greater risk of high intelligence.

While the company has said it will only offer it for “mental disability”, its co-founder Stephen Hsu told *New Scientist*: “If we don’t do it, some other company will.”

Nathan Treff, its chief scientific offi-

cer, said it viewed this as an extension of screening that already exists for conditions such as Down’s syndrome.

“Chromosomal abnormalities are already evaluated,” he said. “For complex disorders though we have to evaluate the entire genome in order to get the risk. The very extreme end of risk, the opposite of intellectual ability, is intellectual disability. There is a potential to avoid that condition by selecting an embryo that does not have it.”

For decades parents have been able to select embryos to avoid known genetic conditions, in a technique known as preimplantation genetic diagnosis (PGD). This has focused on diseases that are attributable to mutations in single genes. The new test is able to extend that to polygenic conditions, where many genes are involved.

Ewan Birney, director of the European Bioinformatics Institute, said he was worried about using this to select

for intellect. He said that, scientifically, there could be unintended consequences, with not enough yet known about the mechanism through which these genetic variants affect intelligence. He also said ethical debate was needed.

In order to be approved in the UK the test would need to be licensed by the Human Fertilisation and Embryology Authority. Simon Fishel, president of Care Fertility, believes they should do so. “It’s always about balancing the good versus the potential for bad. We had this argument when PGD was originally introduced. Without a shadow of a doubt it’s been lifesaving,” he said.

He added that experience has shown that these procedures will be heavily regulated, and he sees no reason why this would be a slippery slope to designer babies. “Cognitive disability is a health issue. We’re not talking about whether we need to make more intelligent people in society,” he said.