Pick the baby, then the mate?

What if you could use a software program to design your ideal child using just a sample of each parent's DNA and a lot of computer processing power? What would your preferences be for eye color? Do you care about hair texture? Skin tone? How about genetically inherited diseases?

That level of pre-conception involvement is now hypothetically possible with a new technology called Matchright from startup Genepeeks.

Matchright, in its first uses, will screen sperm and egg donors to provide potential parents with a pool of donors that they can be confident won't carry a mutation that could harm the baby. The company screens for over 600 diseases, about 100 times what most sperm banks test their donors for. Two US fertility centers will start using the program in mid-April. It will cost $1995 for the service.

To test for all the possible DNA combinations, the program must create about 10,000 hypothetical children from each potential pair of parents. All of this happens on the computer of course, no cells are combined in this process.

But Genepeeks' patent goes beyond screenings for genetic diseases. As Catherine de Lange explains in the Guardian:

> "The Genepeeks technology is firmly based in medical applications for now, but that's not reflected in the patent, which includes a mind-boggling list of traits that have some component of genetic heritability – however small a part it plays. The list includes complex diseases such as cancers, stroke and asthma down to memory, hip circumference, BMI, nicotine dependence and eye and skin pigmentation. "The patent covers any disease or trait that has a genetic influence," Silver says."

Beyond the cosmetic, Matchright's results could also determine the likelihood that a parental pairing will result in a child who will develop a condition well into adulthood like Alzheimer's disease, heart disease or diabetes. The company is primed to start reporting that information as soon as research more accurately identifies which mutations matter most, according to co-founder and Princeton biologist Lee Silver.

And, with all the questions raised by technology, the biggest is who will determine what is ethical to screen for. Do BMI and waist circumference go on the list, or do we proxy that decision by screening for Type 2 diabetes risk? At this point no one knows.

From de Lange writing at New Scientist:

> "Because the simulated embryos are a new concept, it's not yet clear who will regulate the technology. 'There need to be processes and specialists who can deal with it,' says London based fertility consultant Geeta Nargund. Whatever happens, Marcy Darnovsky of the non-

> profit Center for Genetics and Society in Berkley believes that the future of the technology should be open for discussion: ‘It depends a lot on how we approach it from a social perspective. If we want to go down that road we could find ourselves with new inequalities that are written into the genome.”’

But it’s important to note that this technology won’t allow you to pick a specific offspring’s characteristics. The computer program can only tell parents how to increase or decrease their chances by picking a specific donor. The ultimate result still depends on which sperm and which egg meet.

Additional Resources:

- Call to end anonymous egg and sperm donation points to lack of fertility industry regulation, Genetic Literacy Project
- Walking the ethical edge: ‘Made-to-order’ embryos address genuine needs, Genetic Literacy Project
- Is the ‘designer baby’ debate more about gene patentability?, Genomics Law Report