

# Warning about potential impacts on humanity through embryo gene editing

*SINGAPORE:* A global conference on human fertility has been warned of huge societal and ethical challenges regulating advances in gene editing in assisted reproduction.

Speaking at the 10<sup>th</sup> Congress of the Asian Pacific Initiative of Reproduction (ASPIRE), Dr Catherine Racowsky said embryo gene editing was a growing likelihood among latest advances in IVF with potential major impacts on humanity.

“The international community is working hard to develop regulatory guidelines regarding alterations in human genetics, but big questions remain about how and where they will be applied,” she said.

Dr Racowsky, University Consultant of Hospital Foch in France, Professor Emerita of Obstetrics and Gynaecology at Harvard Medical School in the United States and Immediate Past President of the American Society for Reproductive Medicine, was a keynote speaker at the ASPIRE Congress, which is being presented in virtual format – <https://aspire2021.cme-congresses.com> – to fertility specialists in over 100 countries.

She said the first reported birth from a genetically modified embryo was reported in China in 2018 creating a global uproar for violating the international position on human gene editing.

Dr Racowsky said pre-implantation genetic testing (PGT) for embryo selection in IVF is already an accepted test to identify embryos at risk for genetic disorders being passed on to offspring.

New frontiers in germ line gene editing and mitochondrial replacement therapy (MRT) can also be applied to reduce or prevent genetic diseases being passed on to offspring. However, genetic testing also paves the way for embryo selection for desirable traits in offspring including height, eye colour, athletic ability and IQ.

Mitochondria are tiny powerhouses within cells. Inherited from the mother via the egg, they turn consumed sugars, fats and proteins into chemical energy to support life, and they enhance the ability of cells to resist infection or injury.

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Mitochondria carry their own DNA, but when there are genetic defects, or some form of damage occurs, transmission of serious conditions to an offspring may result.

MRT involves replacing or reducing the effect of mutated mitochondria by transferring the chromosomes from an affected egg into an egg with healthy mitochondria from a donor to allow for a healthy pregnancy and baby.

Dr Racowsky said there was a need for continuing wide ranging debate on ethical, societal and religious issues related to these technologies to avoid the possibility of changes in the genetic make-up of Homo sapiens.

“Alterations in the human germ line are likely to be introduced, but there are potential major impacts on humanity,” she warned.

“Huge scientific, clinical, financial and societal hurdles have been overcome in the 43 years since the world’s first IVF baby was born.

“But the emergence of new technologies including mitochondrial replacement therapy and embryo gene editing present important new challenges and concerns.”

Dr Racowsky said artificial intelligence and machine learning technologies were gaining traction in assisted reproduction, for example in selection of the best embryos for transfer in IVF.

“We are in the early days in this field and we need to be careful that these new technologies are adequately validated,” she said.

ASPIRE, the Asia Pacific Initiative on Reproduction, is a unique task force of clinicians and scientists involved in the management of fertility and assisted reproductive technology (ART) throughout the region, which contains about 60 per cent of the world’s population.

The ASPIRE Congress continues in virtual format until Sunday 9 May.

**Interview: To arrange an interview with Dr Catherine Racowsky please contact Trevor Gill, ASPIRE Media Relations, on [lighthousepr@adelaide.on.net](mailto:lighthousepr@adelaide.on.net)**