NEWS IN BRIEF

Edited Embryos

We have crossed an important milestone in the history of genetic manipulation – and the game changer is the gene editing tool called CRISPR. Scientists from Oregan have published a paper in Nature in which they edited an abnormal gene in eggs which were to be fertilzed resulting in healthy embryos. They edited the MYBPC3 mutation which is associated with hypertrophic cardiomyopathy of several embryos. On checking the edited embryos, there were no apparent errors on genome sequencing. Even cell mosaicism that had been reported in previous endeavors was almost entirely absent.

How does the CRISPR technique work? Simply put, a target mutation is identified by a guide RNA. Then the Cas9 enzyme attaches to the identified DNA, and slices it. Natural cell mechanisms are used to repair the spliced DNA. In the study from Oregon, scientists injected the CRISPR gene editing components with the sperm before fertilization. This led to significant decrease in mosaicism.

Currently there is no FDA approval for germ line editing in actual human pregnancies. But the technique looks promising. The ethics, unforeseeable problems which could arise from tinkering with genes, and formidable costs are some of the barriers to the new technology. This is nascent science, powerful science but should not turn out to be deadly science. (*Nature 2 August 2017, Scientific American 2 August 2017*)

Guidelines for Newborn Eye Screening

"Pediatricians are the first line of defence in the newborns world" – states the newly released guidelines for newborn eye screening by the Ministry of Health and Family Welfare. The prevalence of blindness in India is 6.5/10,000 children, of which 50% are preventable. The top three causes are cataract, retinopathy of prematurity (ROP) and vitamin A deficiency.

The guideline for newborn eye screening includes a pictorial tool for pediatricians to be able to identify important eye problems presenting in the neonate. This includes a systematic eye examination of all newborns, including steps of the red reflex testing. Pediatricians are recommended to use an ophthalmoscope at a distance of 18 inches to view the fundus individually and simultaneously. Absence of a symmetric red reflex needs further evaluation by an ophthalmologist.

ROP screening has been recommended for all babies born less than 2 Kg or below 34 weeks of gestations. Babies born between 34-36 weeks with other risk factors such as ventilation or prolonged oxygen requirement are also to be screened. Screening must be done at 4 weeks after birth. Babies born at less than 28 weeks gestation must be screened at 2-3 weeks after birth. Screening must be repeated every two weeks till ROP regresses or vascularization is complete. Indications for laser, cryotherapy and intravitreal avastin have also been laid down. (*http://nhm.gov.in/images/pdf/programmes/RBSK/Resource_Documents/Revised_ROP_Guidelines-Web_Optimized.pdf*)

The Blue Whale Challenge

A deadly online game is urging children round the world to take their own lives. The game was created by 22-year-old Philipp Budeikin, a Russian who is currently spending 3 years in a Siberian jail. The online game is targeting young children urging them to do a series of dangerous tasks which culminate in trying to take one's own life. The tasks range from climbing a crane, carving a specific phrase on the person's own hand or arm, doing secret tasks, poking a needle in the arm or leg, standing on a bridge and roof, listening to music, and watching videos sent to the challengers by the administrator.

A 14-year-old boy from Mumbai who was addicted to the game took his own life by jumping from a multi-storeyed building. Another 14-year-old from Bengal committed suicide by hanging himself. Two children on their way to attempting suicide, one in Indore and one in Solapur, were rescued in the nick of time. In Kerala, there have been 2000 downloads of the game, and the Chief Minister has asked for the game to be banned.

Parents need to be aware of the deadly repercussions of online games and their violent content. Children are easy targets for the cyber brainwashing. (*The Times of India 12 August 2017*)

Redefining the '*P*' Value

Is the currently used cut-off of 0.05 to define a statistically significant '*P*' value really good enough? Apparently not! A group of 72 influential scientists have published a provocative paper explaining why they think it's not. There is increasing doubt on the credibility of various new discoveries. The authors feel that associating "statistically significant" findings with $P<0.05$ results in a high rate of false positives even in the absence of other experimental, procedural and reporting problems.

They propose, that for fields where the threshold for defining statistical significance for new discoveries is $P<0.05$, it should be changed to $P<0.005$. This simple step would immediately improve the reproducibility of scientific research in many fields.

A problem with this suggestion is that there could be many false negatives. The authors propose this could be circumvented by increasing sample sizes. However, the increase in sample size would be of the order of 70% which is difficult for many small researchers.

In many areas of science, the levels for '*P*' value are much lower. For example, in particle physics the cut-off is <0.0000003. In genetics, for more than a decade it has been 0.00000005. Others have discarded the '*P*' value in favor of Bayesian statistics. Ronald Fisher understood that the choice of 0.05 was arbitrary when he introduced it. Since then, theory and empirical evidence have demonstrated that a lower threshold is needed. In the search for truth, maybe it's time to raise the bar. (*Nature 26 July 2017*)

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