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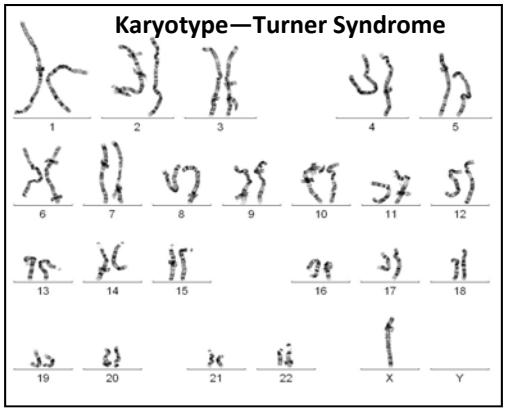
NATIONAL RESEARCH CENTRE FOR GROWTH AND DEVELOPMENT

LENScience Senior Biology Seminar Series
Human Aneuploidy and Related Biotechnologies
Challenge Questions

Post Seminar Challenge Questions



1. Aneuploidy resulting in the loss of an entire chromosome usually results in a non-viable embryo. However, if the chromosome concerned is the X-chromosomes the embryo may live. Explain why the loss of an entire autosome is almost always lethal but the loss of the X-chromosome may not be lethal.

2. Compare and contrast the **three** possible mechanisms by which Trisomy 21 can arise.

3. Discuss how the use of named **biotechnologies** have enabled scientists to develop effective methods of **diagnosing genetic abnormalities in embryos** and how these technologies have met a human need or demand.

4. Pre-natal diagnosis occurs **during** pregnancy and involves either Chronic Villus Testing or Amniocentesis. Pre-implantation diagnosis occurs **before** a pregnancy is established and uses a combination of IVF technologies and genetic testing technologies such as Fluorescence *in situ* hybridization. These technologies have been established to meet a human need and demand.

   (a) Define the human need and demand that has led to the development of these technologies and discuss the biological issues that underpin this need.

   (b) Discuss the ethical issues that arise from the use of these reproductive technologies. Consider whether there are any differences between the issues related to the two types of diagnosis testing (pre-natal vs. PGD) from the perspective of a range of identified groups within New Zealand society.

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