The Processes Involved in Heredity

In organism reproduction of any kind, offspring shares the genetic information of their parents. In the case of asexual reproduction, this is done by the organism replicating itself, creating genetically identical offspring. This differs to sexual reproduction where their offspring has two parents and shares traits from both parents but is genetically different to both parents. The process of these traits passing to offspring is called heredity. This process starts with meiosis. Meiosis is a type of cell division exclusively used to create gametes. This is because in meiosis, the parent cells of the gametes split to reduce the number of chromosomes in the cells to have only one of each type (Villeneuve & Hillers, 2001). This is necessary as humans are diploid and require two of each chromosome, so the gametes must be haploid to create life. In this process of meiosis, the most important part for passing traits to offspring is meiotic recombination. In this function of prophase, the chromosomes physically swap genetic information before splitting again, creating gametes with unique chromosomes (Kohl & Sekelsky, 2013). This recombination means that each offspring has half of their father's genes and half of their mother's, but different offspring from the same parents can have different alleles from their siblings.

How these genes affect the phenotype of an organism is an essential part of how genes are passed from parents to children. Each gene, which codes for an individual trait, has many alleles, creating diversity in the genetic traits of an individual specious. These variations of genes can be either dominant or recessive. This means if a gene is dominant then if someone has that allele in one (heterozygous) or both (homozygous dominant) of their chromosomes then they will display that trait in their phenotype. If a gene is recessive, then someone must have that allele in both of their chromosomes to display that trait ("Genotypes", 2022). An example of this would be the trait of blue eyes. Blue eyes is a recessive gene, so both parents must have at least one copy of the blue eyes trait for their child to have blue eyes. Both gametes which made the child must also contain the blue eyes allele. Once this happens, the child is conceived and will be born with blue eyes. This process works for many traits shown in animals and plants that reproduce sexually.

Reference List

Villeneuve, A., & Hillers, K. (2001). Whence Meiosis?. *Cell*, *106*(6), 647-650. https://doi.org/10.1016/s0092-8674(01)00500-1

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