

Extraction of DNA

Introduction

All living organisms are composed of cells that contain DNA (deoxyribonucleic acid) and RNA (ribonucleic acid) **within** the fourth level of hierarchical structure which contains the hereditary information of the cell. In eukaryotic cells, like humans, animals and plants, this three-chains of ~~chromosomes~~ contained within a membrane bound **nucleus**. In prokaryotic cells, like bacteria, DNA is in a circular form and there is no nucleus. Each species has a basic number of chromosomes, the number humans have 46 (23 pairs), dogs have 78, rats 42, horses 64, sheep 62, etc. 14 and amphibians 22. Spinal chromosomes are called **karyotype** (2n), 1 chromosome comes from each parent during fertilization. The parental genome contains only half of the chromosome content of the zygote and are called **haploid** (n).

Many plants, though, don't always follow the haploid/diploid rule. Wheat and strawberries have 14 chromosomes (2n = 28). Throughout countries of cereals and gardens have collected new species and hybrids of existing species. These species include hexaploids (6n), hexaploids (6n), octaploids (8n) and decaploids (10n). In general these polyploids appear as the more robust plants with bigger fruits, one of the primary reasons they have been selected for. "Why grow these plants when you can grow bigger, healthier ones in the same space?" And genetic researchers will study all the more of the genome than!

The most common cultured strawberry, Fragaria vesca, is an **octaploid**, 8 x 1 chromosome. It is propagated through sexual reproduction, selfing and vegetative, to maintain the consistency of its DNA, although it can undergo sexual reproduction, then the seeds (or haploid) have that are fixed on the outside of the berry, otherwise there is need to maintain the seed gene by making those new generations to be used. One illustration is the case of corn, but it is also true for many haploid chromosome number (2n). Recent research to increase the size (and contribution) of how fruit has resulted in the observation of hexaploids (2 x 14 chromosomes) and hexaploids (2 x 14 chromosomes).

Biochemistry of DNA

Eukaryotic chromosomes are composed primarily of information-carrying nucleic acid and protective proteins. DNA are packaged from which all of the "stuff" of an individual is made. It is the single bond for every chemical and the instructions on how these elements are put together to make each individual organism. While organisms have many similarities and "share" the same DNA information, each species is relatively specifically identifiable as DNA code. This entire code has been determined in many organisms, including humans (see the Human Genome Project for most of the code and how it has been deciphered). Scientists know what the code is, they just don't know what the code codes, other than a couple of known or predicted or inferred genes!

The structure of DNA is that of a twisted ladder, hence a double helix. The sides of the ladder are the DNA backbone of alternating sugar and phosphate molecules. The rungs of the ladder are composed of pairs of nitrogenous bases joined by hydrogen bonds. Adenine (A) and guanine (G) are purines (2 ring molecules), cytosine (C) and thymine (T) are pyrimidines (1 ring molecules). Each ladder rung is made up of one purine paired with a pyrimidine, but only in a certain manner. Adenine and thymine can bond together with 2 hydrogen bonds while cytosine and guanine can pair up with three hydrogen bonds. Adenine cannot pair with either cytosine (3 bases) or thymine (3 bases) or with guanine (another 3-base purine). To help remember the pairing, the correct letters (C) and (G) go together and the incorrect letters (A) and (T) go together. A is paired with T and C is paired with G.