**SING LAB SESSION**

9-12 24th January

**Department of Pathology and Molecular Medicine**

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9-9.30: Introduction

9.30-10: Mitosis

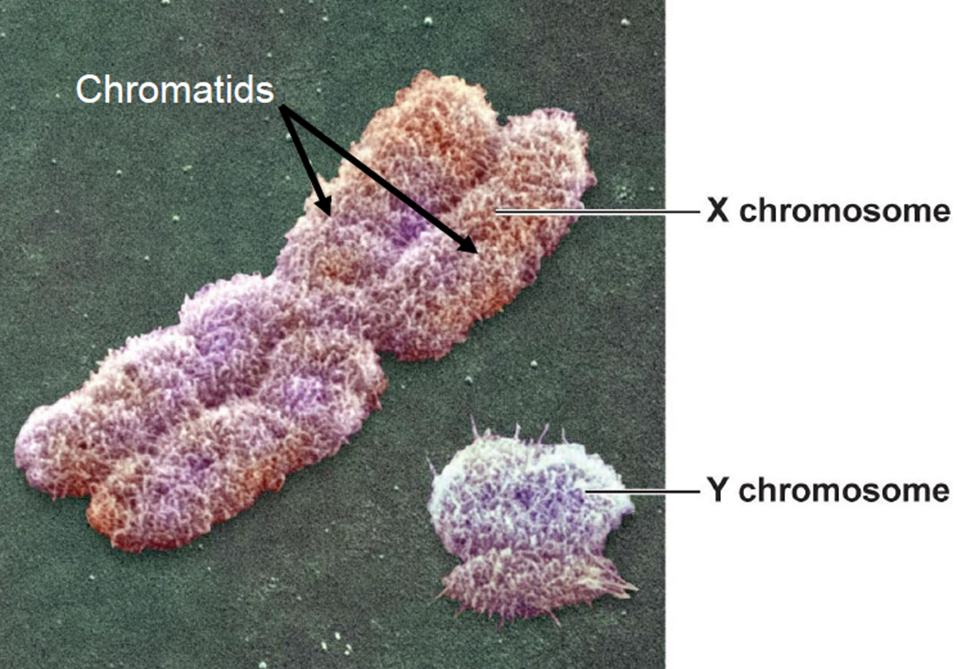
10-10.45: Genetic family tree

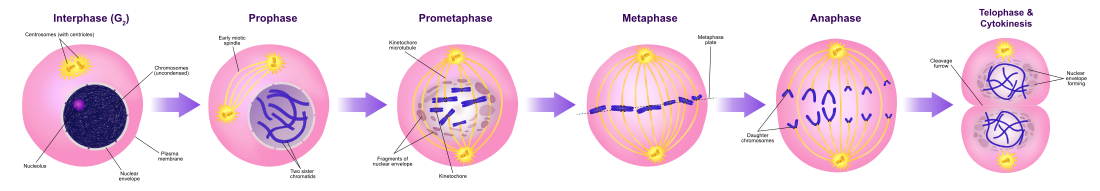
10.45-11.20: 23 and me data exploration and discussion

11.30-12: DNA extraction and discussion

# Mitosis

The term mitosis is used to describe the duplication and distribution of [chromosomes](https://www.britannica.com/science/chromosome), the structures that carry the genetic information. Mitosis a process of cell duplication during which one cell gives rise to two genetically identical daughter cells

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**Viewing cell division and passing of genetic information.**

# Genetic family tree

* The genetic family history can reveal patterns of inheritance
* The genetic family history may help make or refine a diagnosis
* The genetic family history helps assess the likelihood of genetic disease in relatives
* The genetic family history can affect testing, treatment and management strategies
* The genetic family history may highlight the need for referral for specialist opinion
* Taking the genetic family history helps in building rapport with patients

**Presentation and activities**

**Pedigree analysis of Unicorn syndrome**

* Young adult onset condition, presents as a golden bone structure from the skull
* Autosomal dominant condition
* Your paternal grandfather has the condition, his wife didn’t
* Your father has the condition but his sister didn’t
* Your father married Jane
* You have three siblings, one brother, two sisters
* One of your sisters has inherited the Unicorn syndrome

**Crossword (if time)**

# 23 and Me

**Data exploration**

* + Data exploration from genome profile
  + Provide with genotype at a range of SNPs- online research using SNP database- what does it mean?
* Resources/time to be spent:
  + Use 23and Me website and computers and list of my snps: table below (30 mins)
  + dbSNP Home Page, <http://www.ncbi.nlm.nih.gov/SNP/index.html>
  + <https://www.snpedia.com>
* [rs4244285](http://www.snpedia.com/index.php/Rs4244285): SNP in the CYP2C19 gene related to the antiplatelet drug clopidogrel.
* [rs17646946](http://www.snpedia.com/index.php/Rs17646946) & [rs11803731](http://www.snpedia.com/index.php/Rs11803731): Hair curliness.
* [rs2395029](http://www.snpedia.com/index.php/Rs2395029): A variety of conditions (like psoriasis, abacavir hypersensitivity) plus liver damage among patients taking the antibiotic flucloxacillin.
* [rs10757278](http://www.snpedia.com/index.php/Rs10757278): Risk for coronary artery disease and it’s consequences (like heart attacks).
* s12913832 is a SNP near the [OCA2](https://www.snpedia.com/index.php/OCA2) gene that may be functionally linked to blue or brown [eye color](https://www.snpedia.com/index.php/Eye_color), due to a lowering of promoter activity of the [OCA2](https://www.snpedia.com/index.php/OCA2) gene. Blue [eye color](https://www.snpedia.com/index.php/Eye_color) is associated with the rs12913832(G;G) genotype.
* Rs1815739 This [SNP](https://www.snpedia.com/index.php/SNP), in the [ACTN3](https://www.snpedia.com/index.php/ACTN3) gene, encodes a premature stop codon in a muscle protein called alpha-actinin-3. The polymorphism alters position 577 of the alpha-actinin-3 protein. In publications the (C;C) genotype is often called RR, whereas the (T;T) genotype is often called XX.
* Rs1426654This SNP influences [skin pigmentation](https://www.snpedia.com/index.php/Skin_pigmentation). The allele, A111T, rs1426654(A), indicates light-skinned european ancestry

**Activity based on data below: find out info about me….look up snp and interpret what my genotype means for me.**

Michelle’s data: interpret

|  |  |  |  |
| --- | --- | --- | --- |
| rs1815739 | 11 | 66328095 | CC |
| rs17646946 | 1 | 152062767 | AA |
| rs11803731 | 1 | 152083325 | TT |
|  |  |  |  |
| rs12913832 | 15 | 28365618 | AG |
| rs1426654 | 15 | 48426484 | AA |
|  |  |  |  |
| rs10757278 | 9 | 22124477 | AA |
| rs4244285 | 10 | 96541616 | GG |
| rs2395029 | 6 | 31431780 | TT |

# DNA extraction from strawberries

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