* Sympatric – overlap
* Parapatric – come together
* Strong genetic divergence despite ongoing gene flow – lots of gene flow would result in homogeneity and prevent genetic divergence
* Can happen pre-zygotic – behaviour such as mate preference – magic trait (under selection)
* Post-zygotic isolation – selection after hybridisation
* Post zygotic isolation
  + Maybe allopatric and then meet together again
  + Genetic incompatibility
  + Secondary structure to prevent breedings between different population to prevent hybridisation
  + Hybrid incompatibility – secondary contact – genetic mechanisms that impede hybrid incompatibility – independent of localised adaptation – gene duplication, changes in ploidy etc.
* Pre-zygotic
  + Disruptive selection – habitat based – partitioning according to depth for example – happen rapidly
  + Reducing recombination – can cause speciation – mating is based upon traits under selection – timing of traits (eg. flowering in plants – plants flowering different times – no cross pollination opportunity)
  + Magic traits – eg. drosophila – can lose water – mate choice being mediated under traits under divergence selection – desiccation resistance
  + Eg. cichlids – different frequencies filtered out according to depth – assortative mating – associated with opsin gene – under selection divergence – not neutral – linkage disequilibrium between opsin gene and colour of the male cichlids – colour of individual and opsin are related and related to fitness
  + Assortative mating – like and like – eg. frogs - colour important for fitness to signal poison – mate choice – colours are fitter in their own environment
* Adaptive loci involving in pre-zygotic mating – perhaps happen more often than not when – loci is close to centromere (lower recombination) so inherited together despite gene flow – all hypotheses
  + Chromosomal inversion – complicate recombination
  + Physical linkage – minimise recombination
  + Pleiotropy – one gene has more than one traits
* GWAS – more whole genome available – look at the outliers
* Processes that minimise gene recombination – divergence – projects to get many genomes sequenced as possible – better databases that describe gene functions – lots of data – no shortage of data – bioinformatics becoming an important skill
* Conservation genetics – major aim is to preserve evolutionary potential –multidisciplinary – small population paradigm
* Fis – within habitat patches – Fst is between habitat patches – pull samples together without knowing they have genetic structure – predict under HW a higher heteozygosity than expected – a positive F??? because of genetic structure
* Are there people paid just to investigate gene functions – postdoctoral positions – organisations like genbank etc