

# Mutations

Mutation



Mutagenic Agent



Substitution



e.g.



## Types of Mutations :

Addition



Deletion



Inversion



Duplication



Translocation

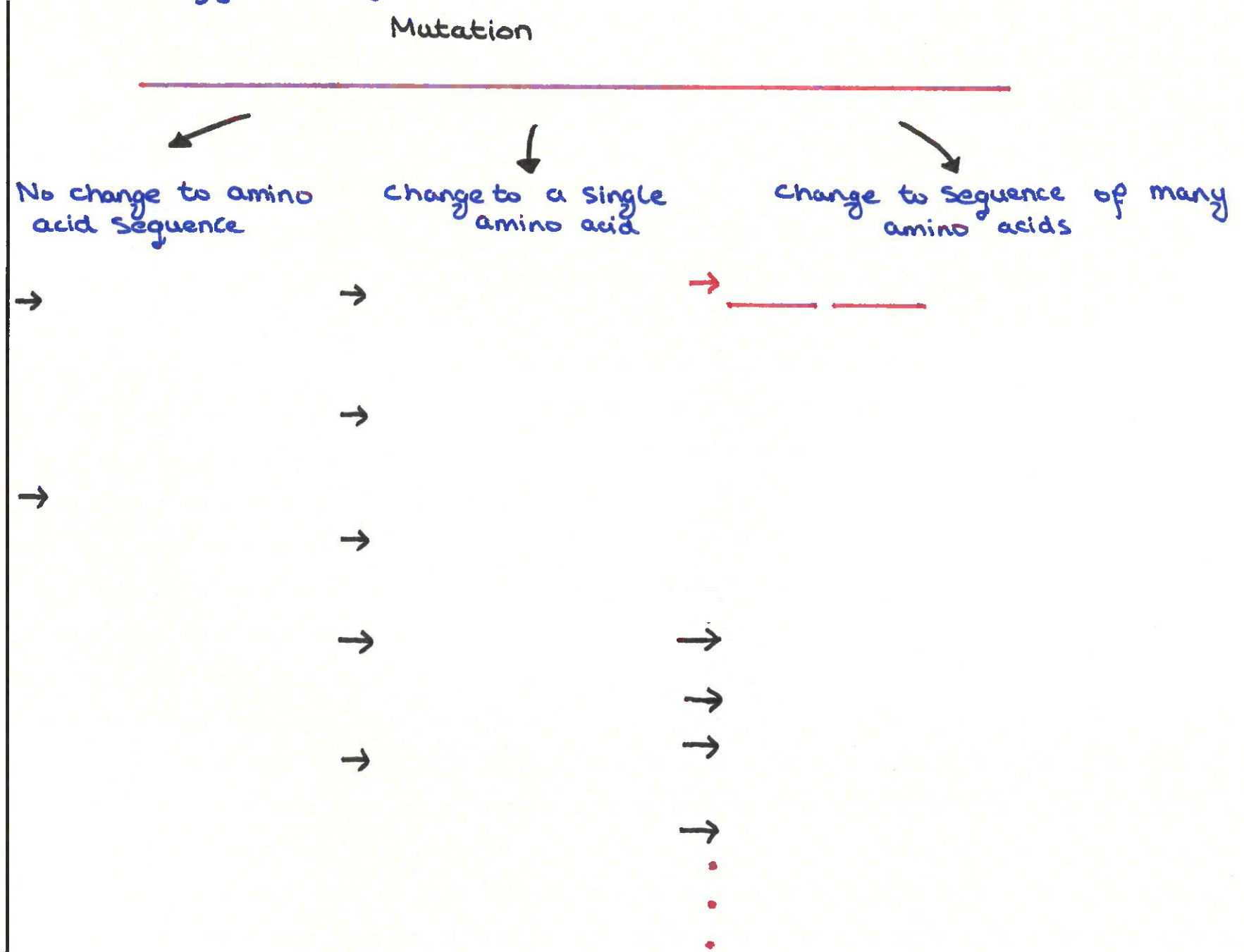


Mutation

# Affects of Mutations

Degenerate

Frame Shift





TT

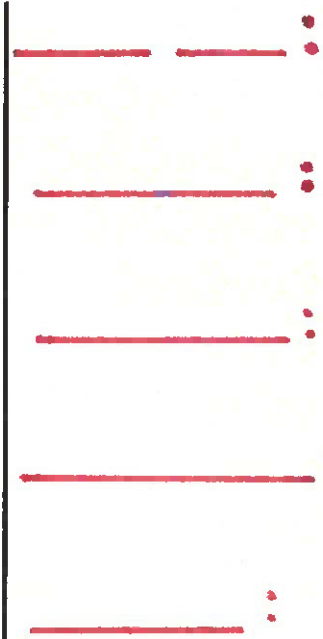
Stem Cells

# Stem Cells

Totipotent

Pluripotent

Multipotent



## Cell Specialisation / Differentiation

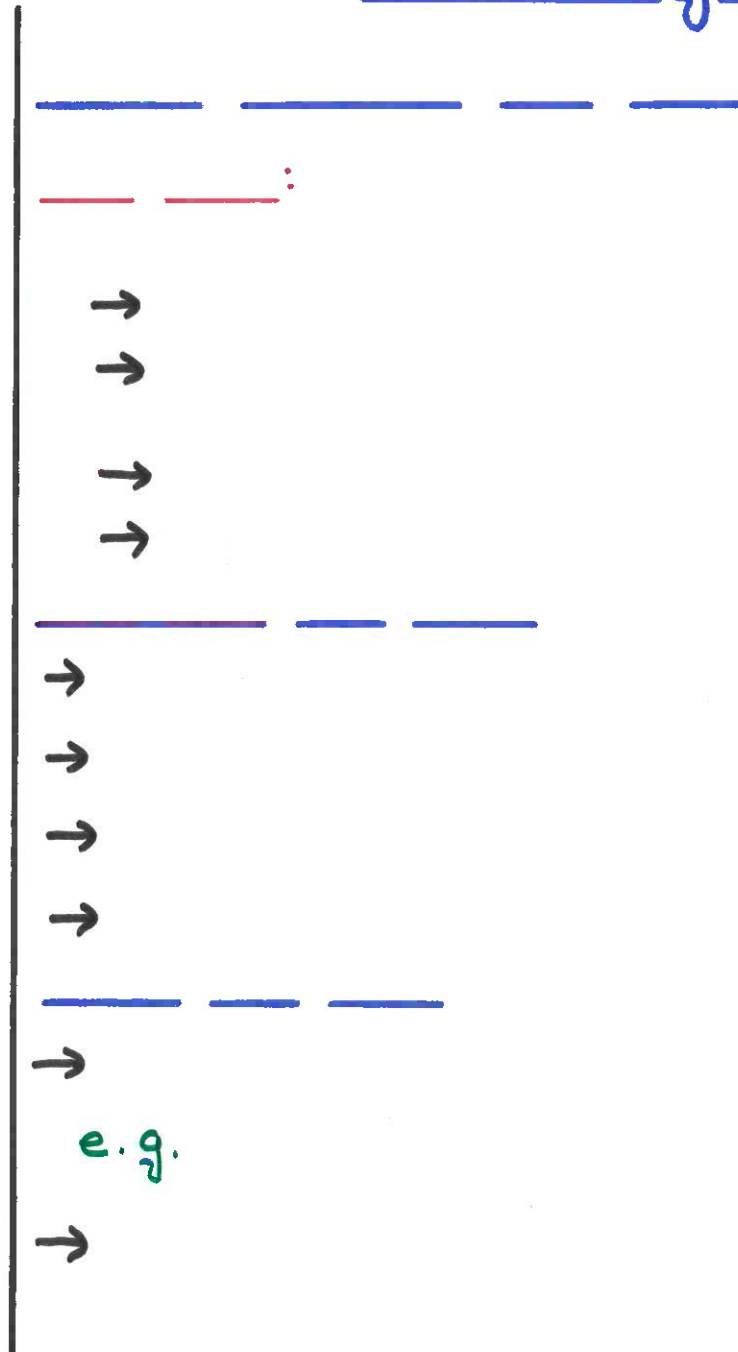
Unipotent





# Obtaining Stem Cells

iPS cells



e.g.



# Stem Cells & Medicine



## Bone Marrow Transplant



## Advantages



## Grow New Organs



## Ethical Issues





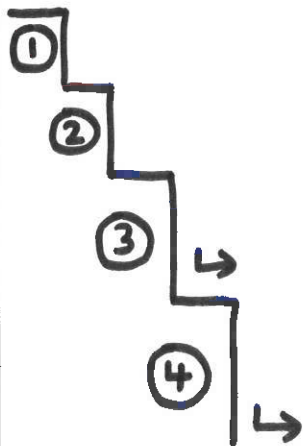
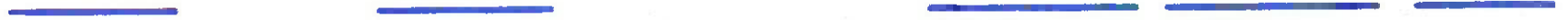
# Transcription Factors

- 1
- 2
- 3
- 4
- 5

Transcription Factors



Promoter Region



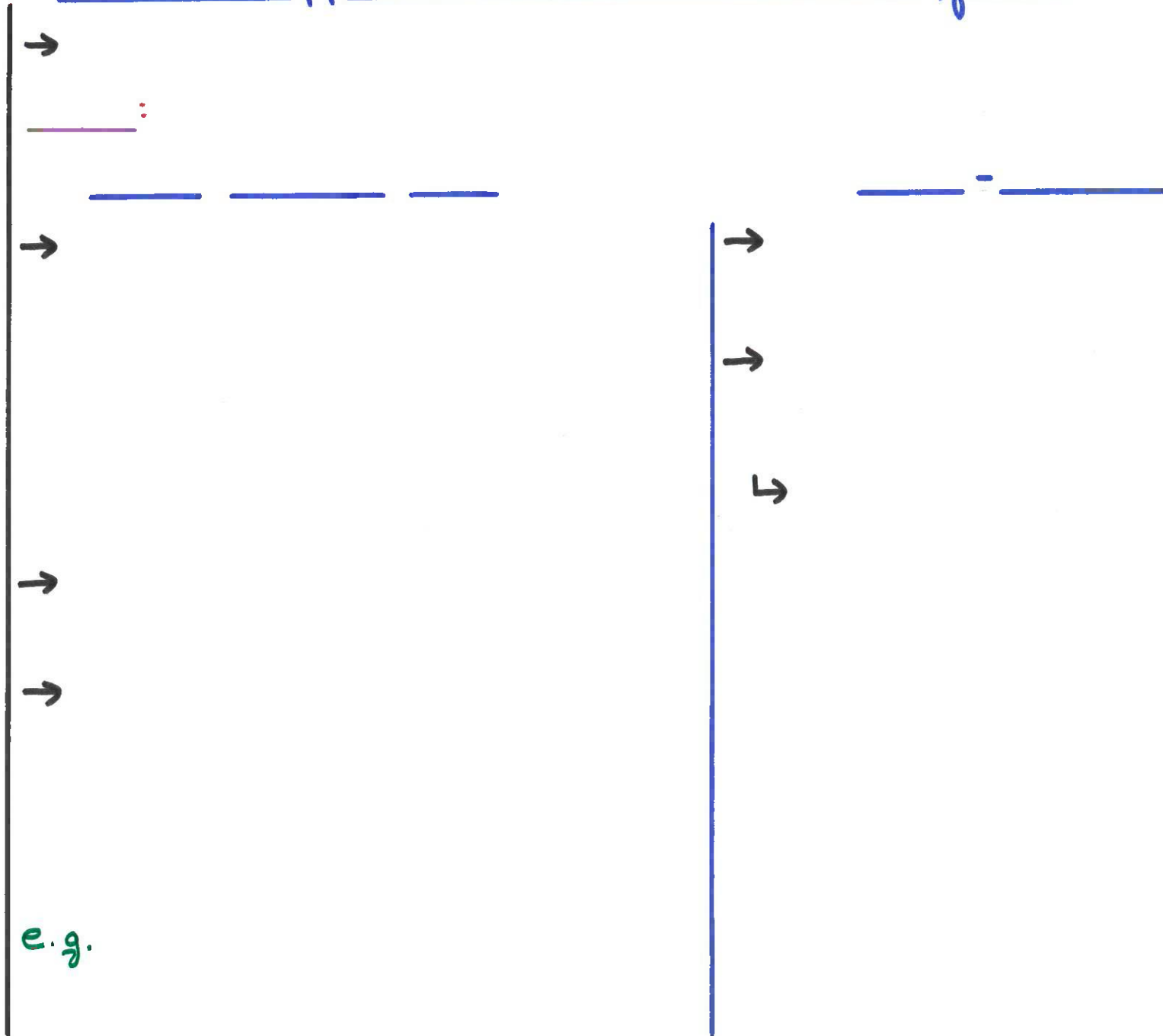
e.g.



Cancer

# Tumour Suppressor Genes & Proto-oncogenes

- 1
- 2
- 3
- 4
- 5





Epigenetics

# Epigenetics

- 1
- 2
- 3
- 4
- 5

CpG site



Methyl Group

Acetyl Group

Histones





# RNA Interference (RNAi)

- 1
- 2
- 3
- 4
- 5

RNA interference →

siRNA

microRNA





# Cancer & Tumours

Benign Tumour



## Types of Tumour

\_\_\_\_\_ :

Malignant Tumour



\_\_\_\_\_ :



## Oestrogen + Breast Cancer



## Identifying Tumour Cells





# Genome Projects

Genome

\_\_\_\_\_ :

\_\_\_\_\_ :

\_\_\_\_\_

- 
- 
- 
- 

Proteome

\_\_\_\_\_

Simple Organisms

Complex Organisms

uses

e.g.

e.g.

→

→

→

→

→

→

→

e.g.