The background of the slide features a dense, abstract pattern of overlapping circles in various sizes and colors, including shades of pink, blue, and grey, creating a sense of depth and motion.

WHAT IS FUNCTIONAL GENOMICS?

ALISTAIR MARTIN

CRUK BIOINFORMATICS SUMMER SCHOOL

JULY 23RD 2018

WHAT IS FUNCTIONAL GENOMICS?

Determination of the relationship between an organism's genome and its phenotype



WHAT IS FUNCTIONAL GENOMICS?

Determination of the relationship between an organism's genome and its phenotype



WHAT IS FUNCTIONAL GENOMICS?

Determination of the relationship between an organism's genome and its **phenotype**

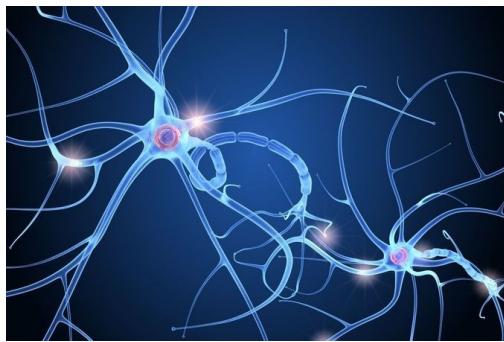


Slight variation
in genome
(~0.1% different)

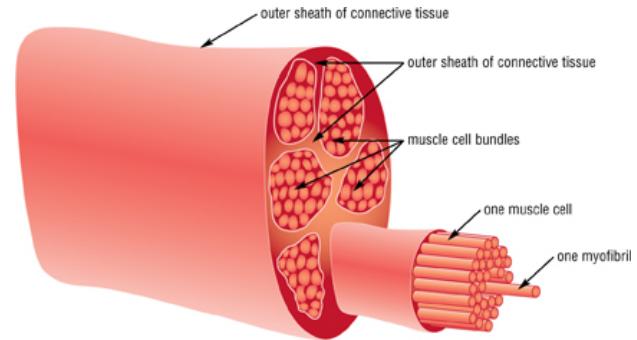


WHAT IS FUNCTIONAL GENOMICS?

Determination of the relationship between an organism's genome and its **phenotype**



No variation
in genome



WHAT IS (NOT) FUNCTIONAL GENOMICS?



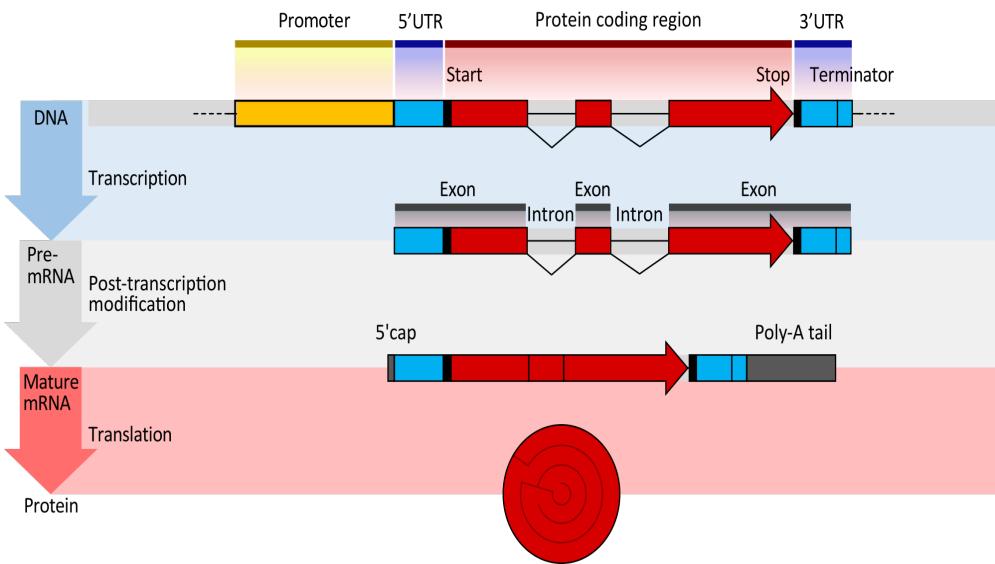
WHAT IS FUNCTIONAL GENOMICS?

Typical functional genomics questions:

- When and where are genes expressed?
- How do gene expression levels differ in various cell types and states?
- What are the functional roles of different genes and in what cellular processes do they participate?
- How are genes regulated?
- Where are the active gene promoters in a particular cell type?
- How do genes and gene products interact?
- How does gene expression change in various diseases or following a treatment?

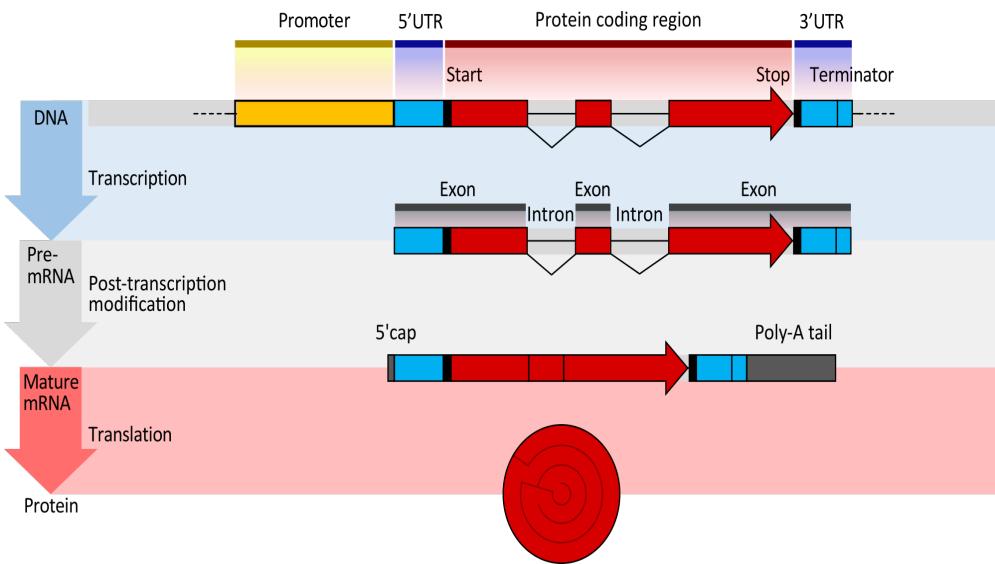


WHAT IS FUNCTIONAL GENOMICS?



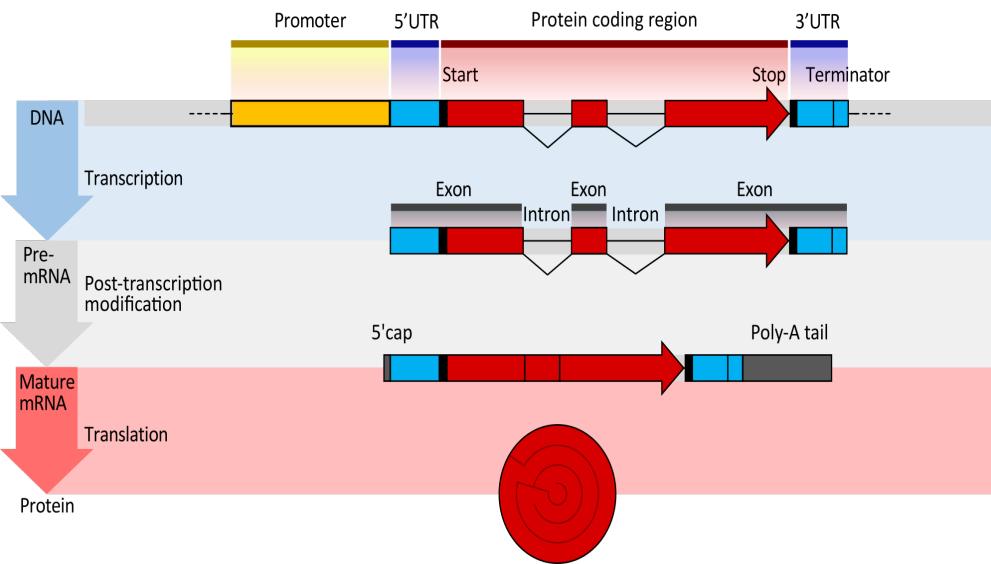
- Variant detection
 - aCGH
 - FISH
 - Sanger
- Epigenetics
 - ChIP-seq
 - Bisulfite seq

WHAT IS FUNCTIONAL GENOMICS?



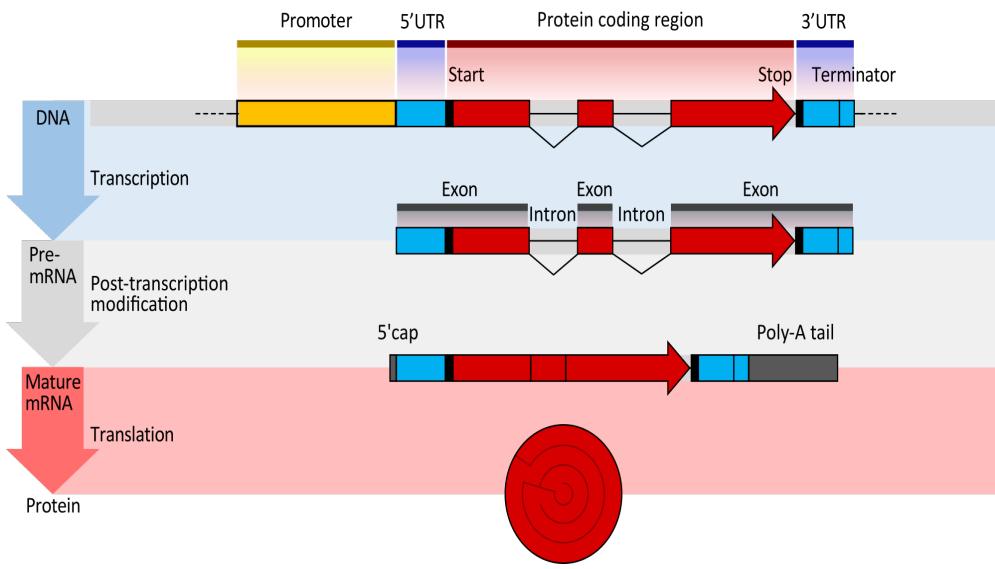
- Transcriptomics
 - Northern Blot
 - qPCR
 - RNA-seq

WHAT IS FUNCTIONAL GENOMICS?



- Transcriptomics
 - Ribo-seq

WHAT IS FUNCTIONAL GENOMICS?

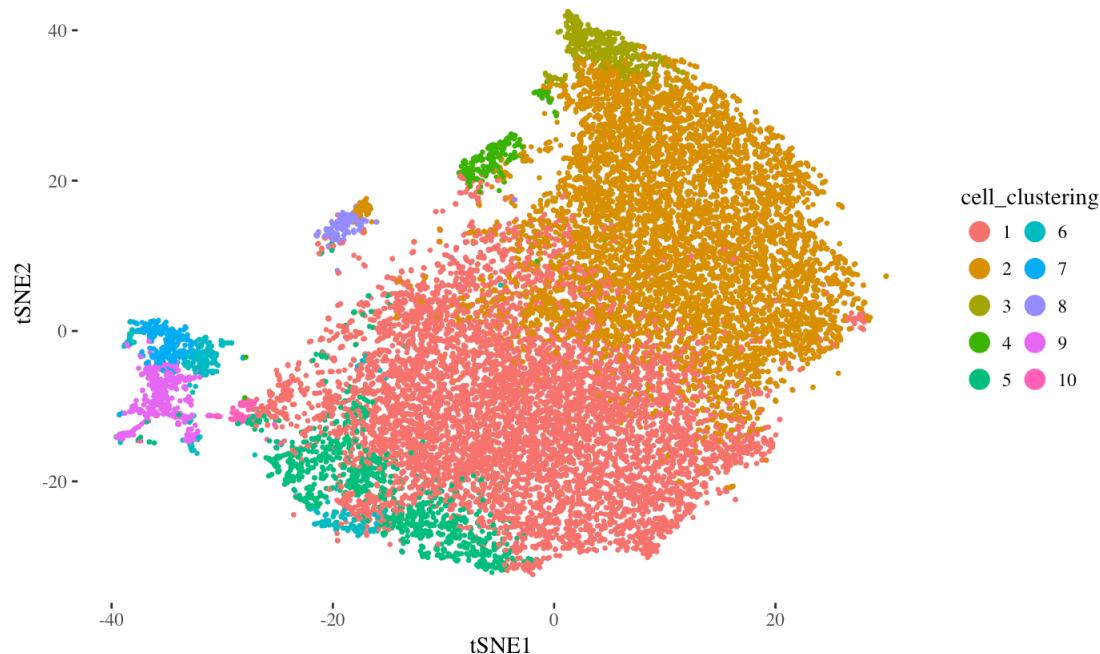


- Proteomics
 - MS
 - CyTOF
 - Crystallography



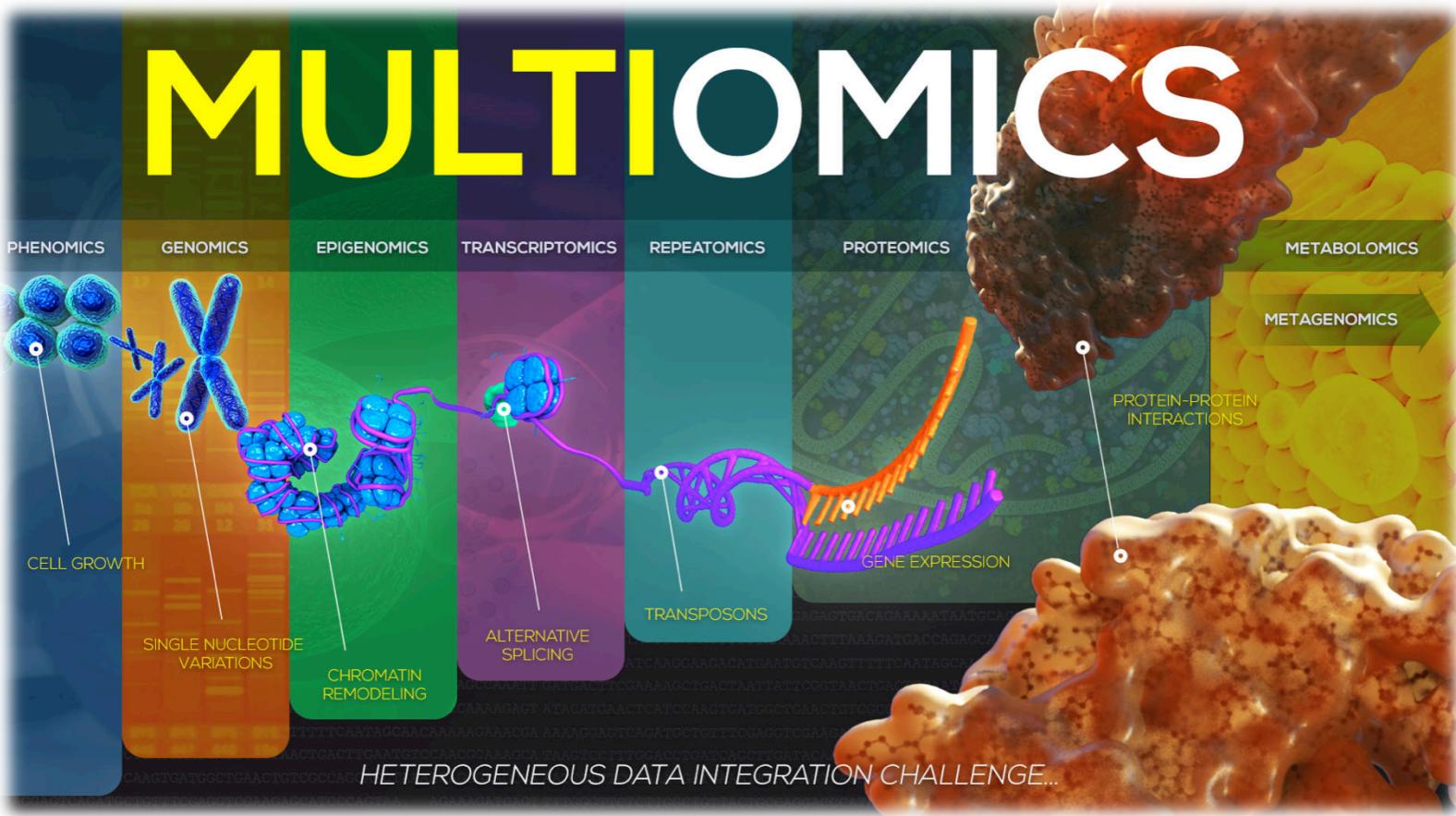
WHAT IS FUNCTIONAL GENOMICS?

Single-cell sequencing



scRNAseq on Xenograft tumour

WHAT IS FUNCTIONAL GENOMICS?



ACKNOWLEDGEMENTS

Contributions to slides:
Benilton S Carvalho
Nuno Barbosa-Morais
Stephen J Eglan
Natalie Thorne
Rory Stark



UNIVERSITY OF
CAMBRIDGE



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