

Introduction to the FAANG project

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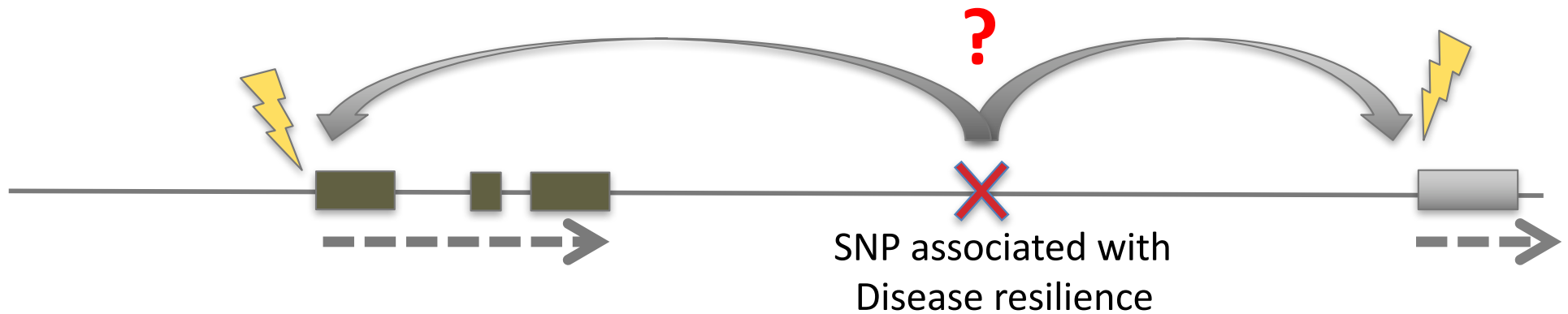
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ENCODE project

Purpose: to determine the functional elements of the human genome

Rationale for project

- SNPs associated with disease/traits are often inter-genic
- evolutionary comparisons have shown that some inter-genic and non-translated regions are strikingly well-conserved

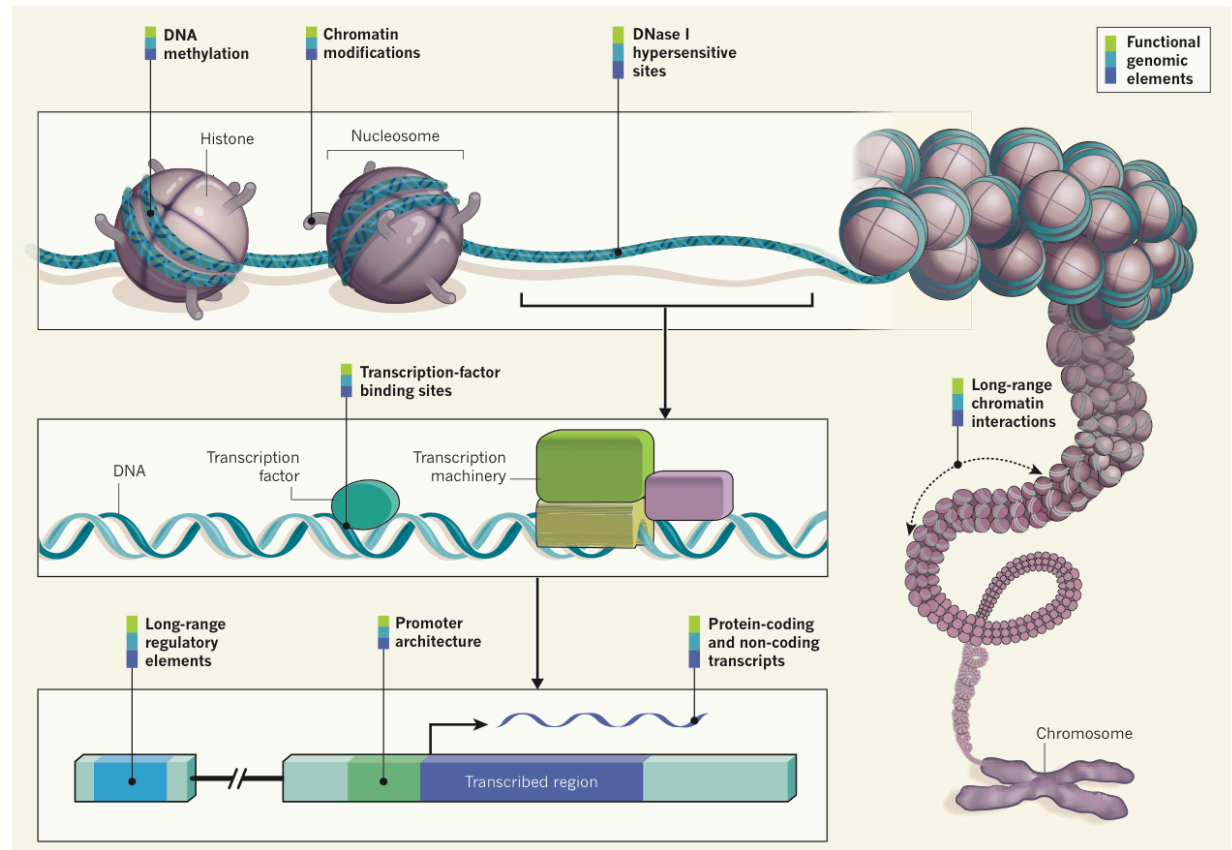


So we must understand function of “non-genic” regions of genome!

ENCODE described

To understand function:

- a) what part is transcribed into RNA? - **RNAseq**
- b) what regulatory mechanisms control this transcription:



- Landmarks bound by regulatory proteins
- Chromatin modifications also mark transcription and “openness”
- Methylation of DNA is associated with regulation as well
- Chromatin interactions

ENCODE results

Collecting all these data (hundreds of experiments) allowed *predictive models* for genome function to be developed

- Predicts Chromatin State in the genome- OPEN or CLOSED, function
- Created a Segmentation map of function across the genome

Success in ENCODE required:

- High quality reference genome sequence
- Standardized infrastructure providing
 - Biological resources
 - Bioinformatics tools
 - Databases
- **Effective coordination and communication**

FAANG needs all these to succeed!

Main current activities

- **Establish set of Core assays, begin to develop ENCODE-type functional data**
- **Develop tissue description, storage and sharing protocols**
- **Develop computational tools to analyze data**
- **Develop bioinformatics infrastructure**
- **Develop communication mechanisms**

FAANG Pilot and FAANG-related projects

Species	Leading Inst. & country	
pig, cattle, goat, chicken	INRA	France
pig, cattle, chicken	UC-Davis	US
horse	UC-Davis & Univ. Nebraska	US
cattle	Leibniz Inst. for Farm Anim. Biology	Germany
Sheep	Int. Sheep Genome Consortium & others	Australia & US
pig, chicken	Wageningen Univ.	The Netherlands
cattle	Dairy Futures Coop. Res. Centre, AgriBio & others	Australia
cattle, pig	Alberta & Guelph Univ. & others	Canada
cattle and zebu	Adelaide Univ.	Australia
sheep, buffalo	Roslin- Edinburgh Univ.	UK
cattle	Washington State Univ.	US
'Arctic Ark'	Natural Resources Institute	Finland

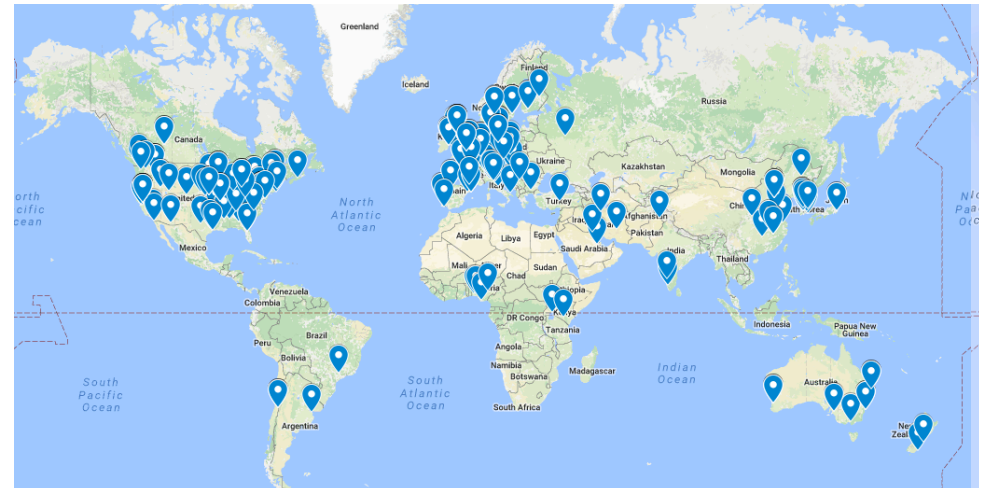
Global FAANG Consortium

Organic growth of FAANG during 2015-2017

Current FAANG contributors= >350



2014 membership- GB authors



2017 membership

Institutions supporting FAANG



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