

Deciphering the function and evolution of the centromeric repeats in Primates

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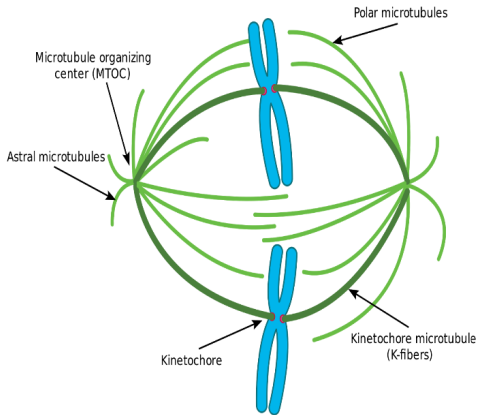
Unité: Structure et Instabilité des génomes

CNRS UMR 7196 / INSERM U1154 / MNHN

19/02/18

About the centromere

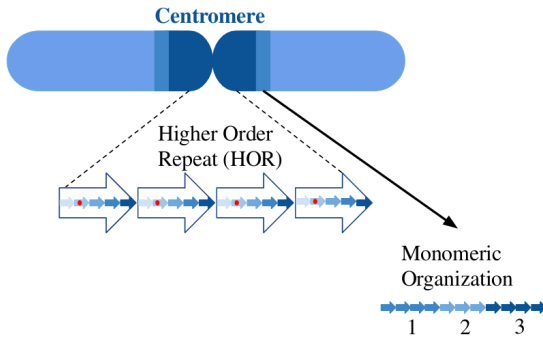
- Chromatin structure
- Cell division
- Conserved proteins
- Not conserved DNA
 - **Satellite DNA**
 - Function ?



Albert et al., 2002

Satellite DNA in Primates

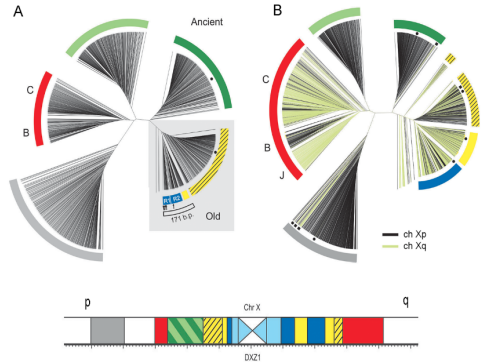
- α -satellite
- 170 pb
- > 70% similarity
- Several families
- Binding sites : CENP-B, pJ α
- Specific spatial organisation



Studies in human :

Phylogenetic analysis of pericentromeric monomers

- Age-gradient hypothesis
- Identification of 5 families



Shepelev et al., 2009

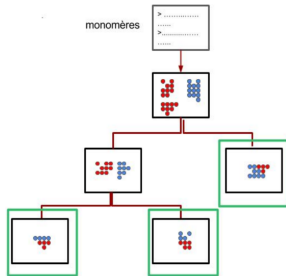
1- Choose species for analysis

Species	# of α -sat.	Sequencing
<i>Cercopithecus pogonias</i>	112 902	Ion torrent
<i>Cercopithecus solatus</i>	105 529	Ion torrent
<i>Chlorocebus sabaeus</i>	29 842	Illumina
<i>Macaca fascicularis</i>	39 893	LS454
<i>Macaca fascicularis</i>	195 642	Assembly

- 1- Choose species for analysis
- 2 - Identify families for each species

A-Method of classification

- Binary classification
- Objective and reproducible method
- Process big amount of short sequences

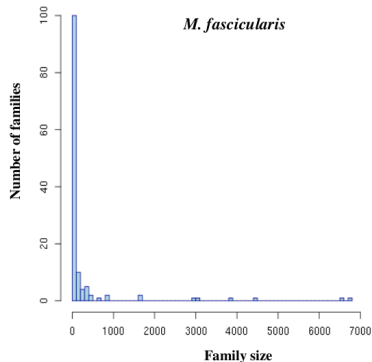
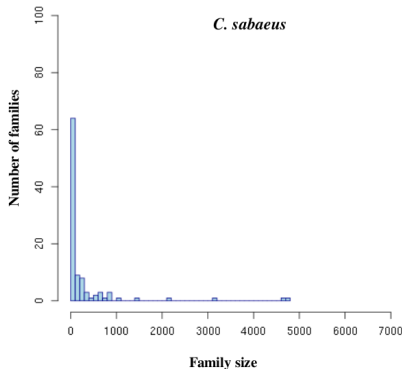


Jornod,2017

Goals

- 1- Choose species for analysis
- 2 - Identify families for each species

B-Preliminary results



- 1- Choose species for analysis
- 2 - Identify families for each species

B-Results

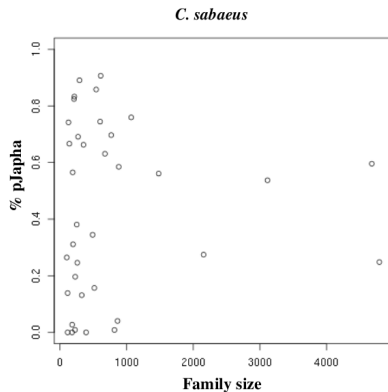
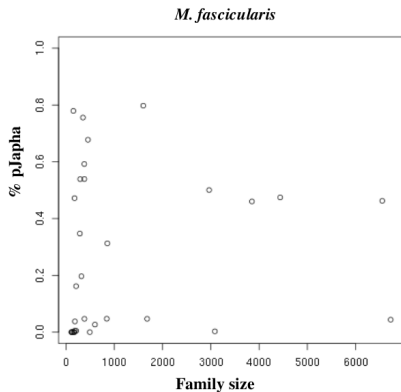
	<i>C. sabaesus</i>	<i>M. fascicularis</i>
#Families	100	132
#Families > 100 sequences	36	32
% Sequences	95,3%	96,6%

- 1- Choose species for analysis
- 2 - Identify families for each species
- 3 - Characterize families into each species**
 - binding sites
 - percentage of similarity

Goals

- 1- Choose species for analysis
- 2 - Identify families for each species
- 3 - Characterize families into each species

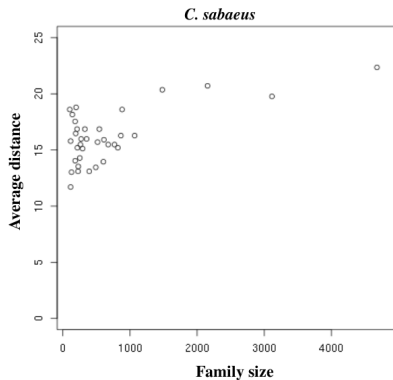
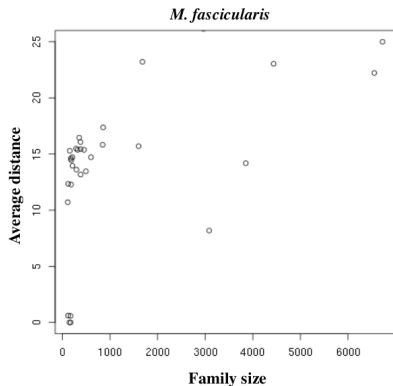
A-Binding site



Goals

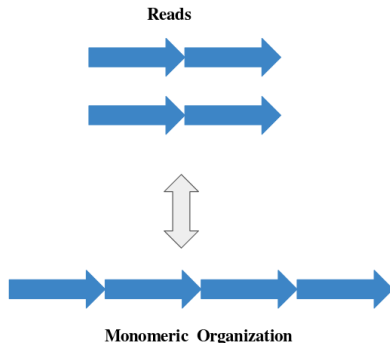
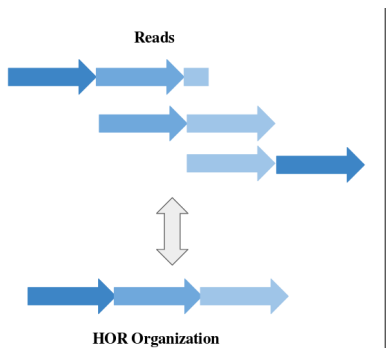
- 1- Choose species for analysis
- 2 - Identify families for each species
- 3 - Characterize families into each species

B-Similarity



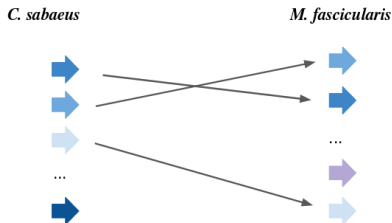
Goals

- 1- Choose species for analysis
- 2 - Identify families for each species
- 3 - Characterize families into each species
- 4 -1. Spatial organization analysis**



Goals

- 1- Choose species for analysis
- 2 - Identify families for each species
- 3 - Characterize families into each species
- 4 -1. Interspecific comparison
- 4 -2. Interspecific comparison**





Work
in
progress