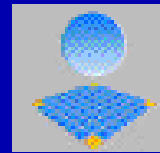
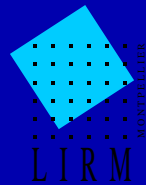


# Comparison of Minisatellites

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# Minisatellites (ms)

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- Class of tandem repeat: Satellites, Minisatellites, Microsatellites
- ms undergo tandem amplifications and tandem contractions  
⇒ variation in their number of units
- ms maps : there is a specific method to obtain the sequence of variants of the unit, **Minisatellite Variant Repeat PCR** [Jeffreys et al. 91]
- Example of a minisatellite
  - s = cggcgat cggcgac cggagat cggcgat cggcgat cggagat cgacgat

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- Example of a minisatellite map:
  - s = **cggcgat** **cggcgac** **cggagat** **cggcgat** **cggcgat** **cggagat** **cgacgat**
  - New alphabet: **A** = **cggcgat** **B** = **cggcgac** **C** = **cggagat** **D** = **cgacgat**
  - Corresponding map: **A B C A A C D**

# Single Step Evolutionary Model

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- Operations

- **Amplification(A)/Contraction(C)** duplicates/removes a variant which is next to an identical variant
- **Mutation(M)** mutates one variant into another
- **Insertion(I)/Deletion(D)** inserts/removes a variant, but without constraint

- Example of alignment:

I1:	A	A	A	B	B	C	B	D	D	B	A
		[		[	/		/		/	/	
I2:	A	E	A	A	-	-	-	-	-	-	A

# Single Step Evolutionary Model

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- Operations

- **Amplification(A)/Contraction(C)** duplicates/removes a variant which is next to an identical variant
- **Mutation(M)** mutates one variant into another
- **Insertion(I)/Deletion(D)** inserts/removes a variant, but without constraint
- **Generation(G)/Compression(K)** generates/compresses an **arch** from/to its single ancestor variant

- Example of alignment:

I1:	A	A	A	B	B	C	B	D	D	B	A
		[		[	/		/		/	/	
I2:	A	E	A	A	-	-	-	-	-	-	A

# Minisatellite MSY1

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- MSY1 is a ms on the Y chromosome [Jobling et al 98]
  - Unit length 25bp, 5 variants differ by at most 4 residues
  - Evolution simplified: no exchange between alleles
- Maps for 690 men taken in different populations distributed in 24 haplogroups
- Experiments:
  1. Compute all pairwise alignments
  2. Construct a phylogenetic tree with BioNJ from our distance matrix

