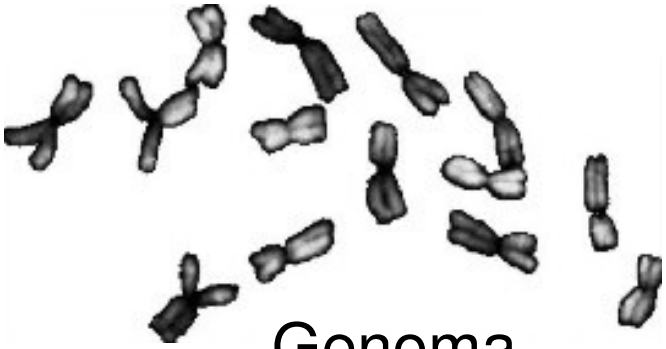
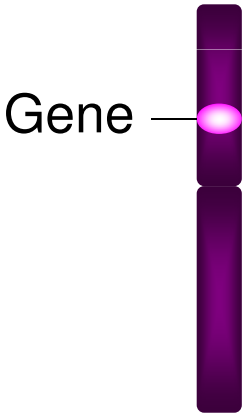
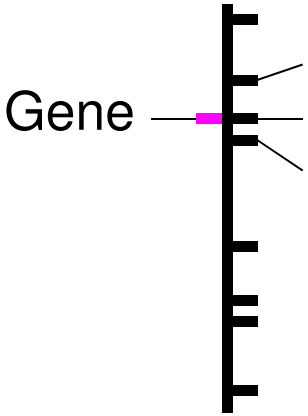


Genoma



Cromosoma

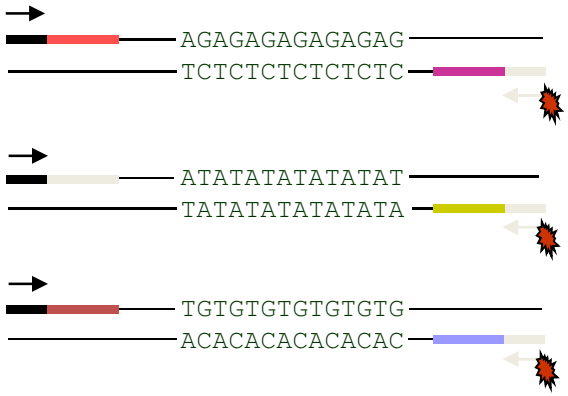


Marcatore concatenato

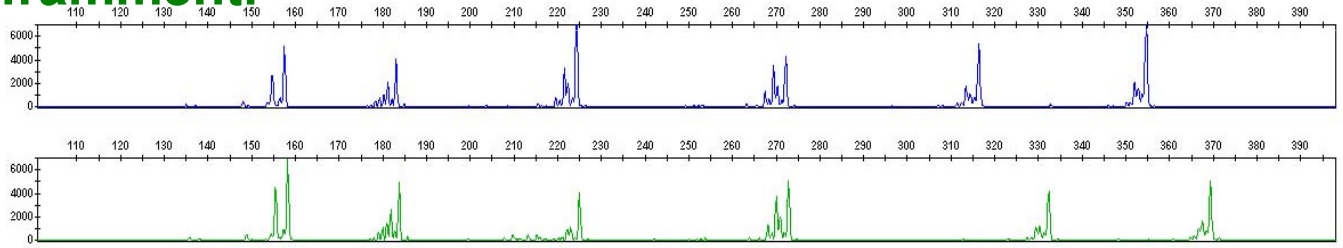
Mappa molecolare

Microsatelliti (SSR markers)

Ripetizioni di sequenze semplici



Variablità di lunghezza dei frammenti

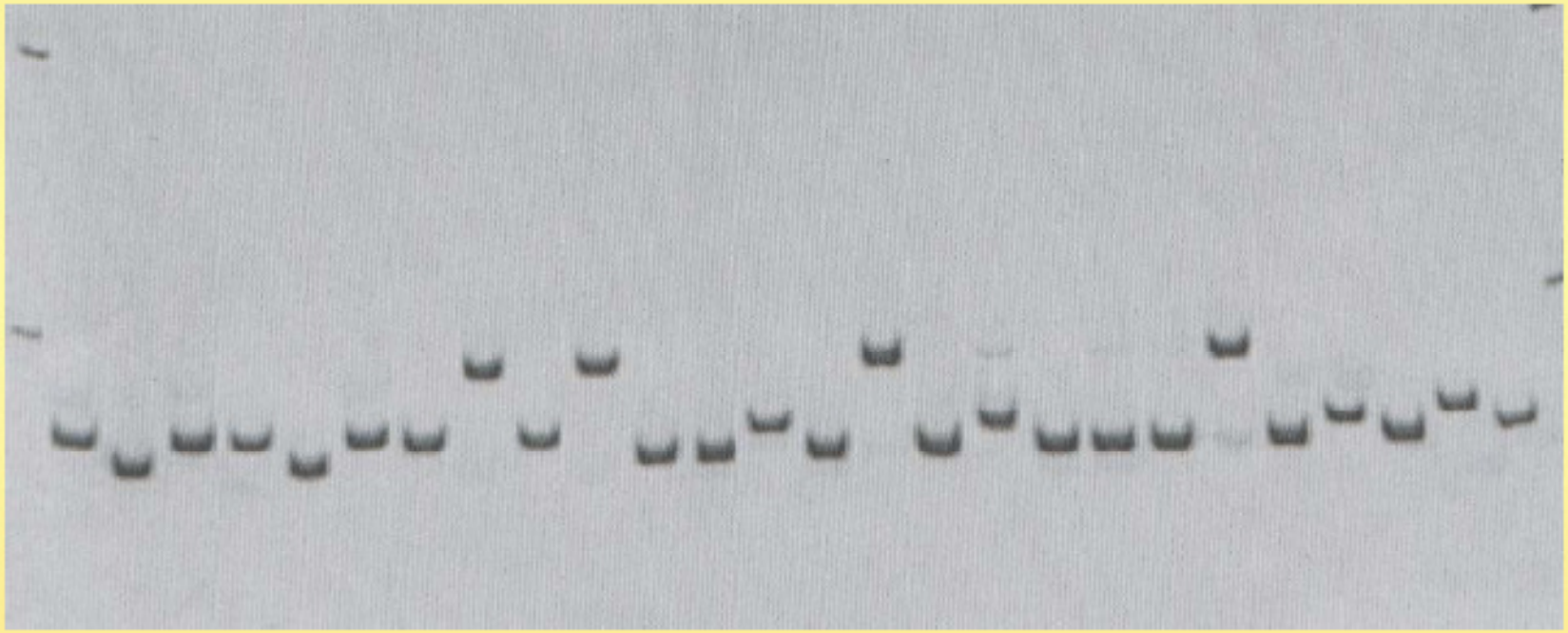


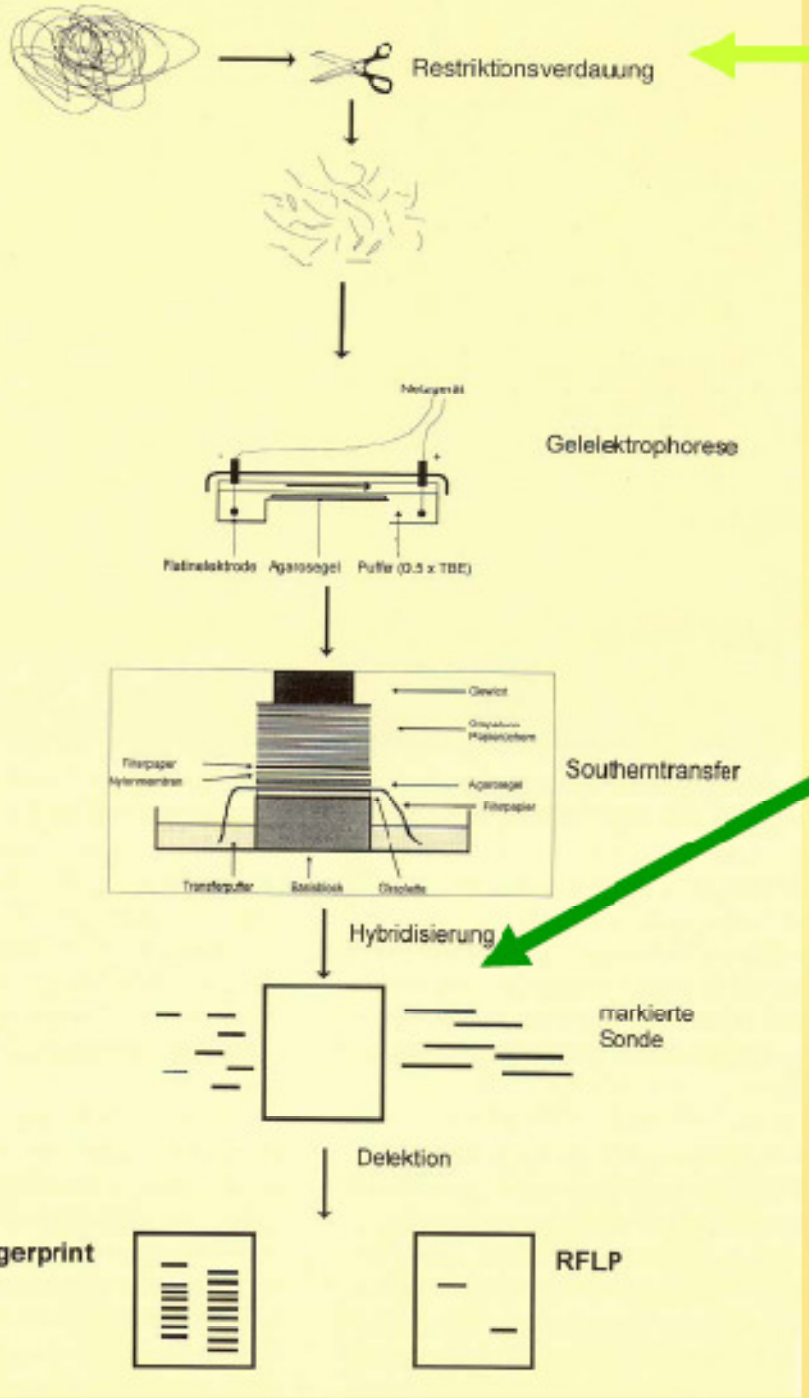
Dati di analisi di marcatori

- Nomi degli alleli di lunghezza

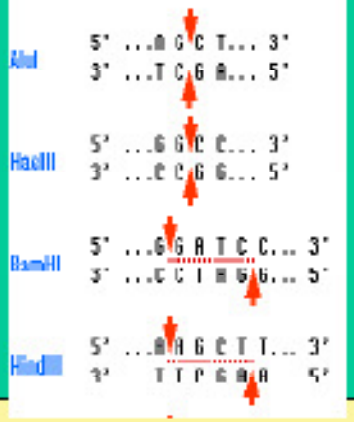
157	183	224	273	317	355	
157	183	224	273	333	370	
155	183	A	A	B	B	B B	55
157	181	A	A	B	B	A A	55
		B	A	A	A	B B	
		A	B	A	B	B B	

Example of SSR markers





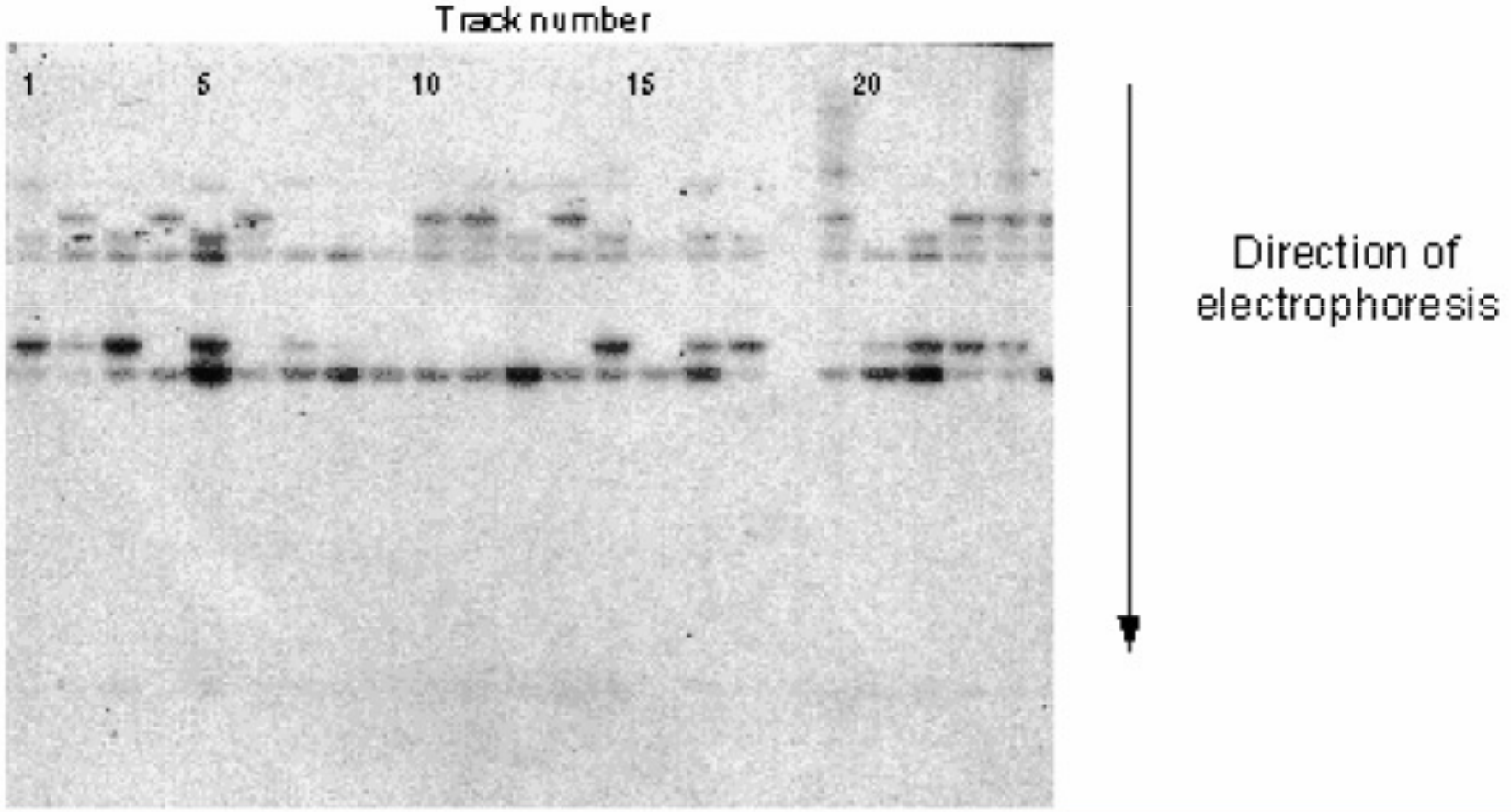
Restriction enzymes

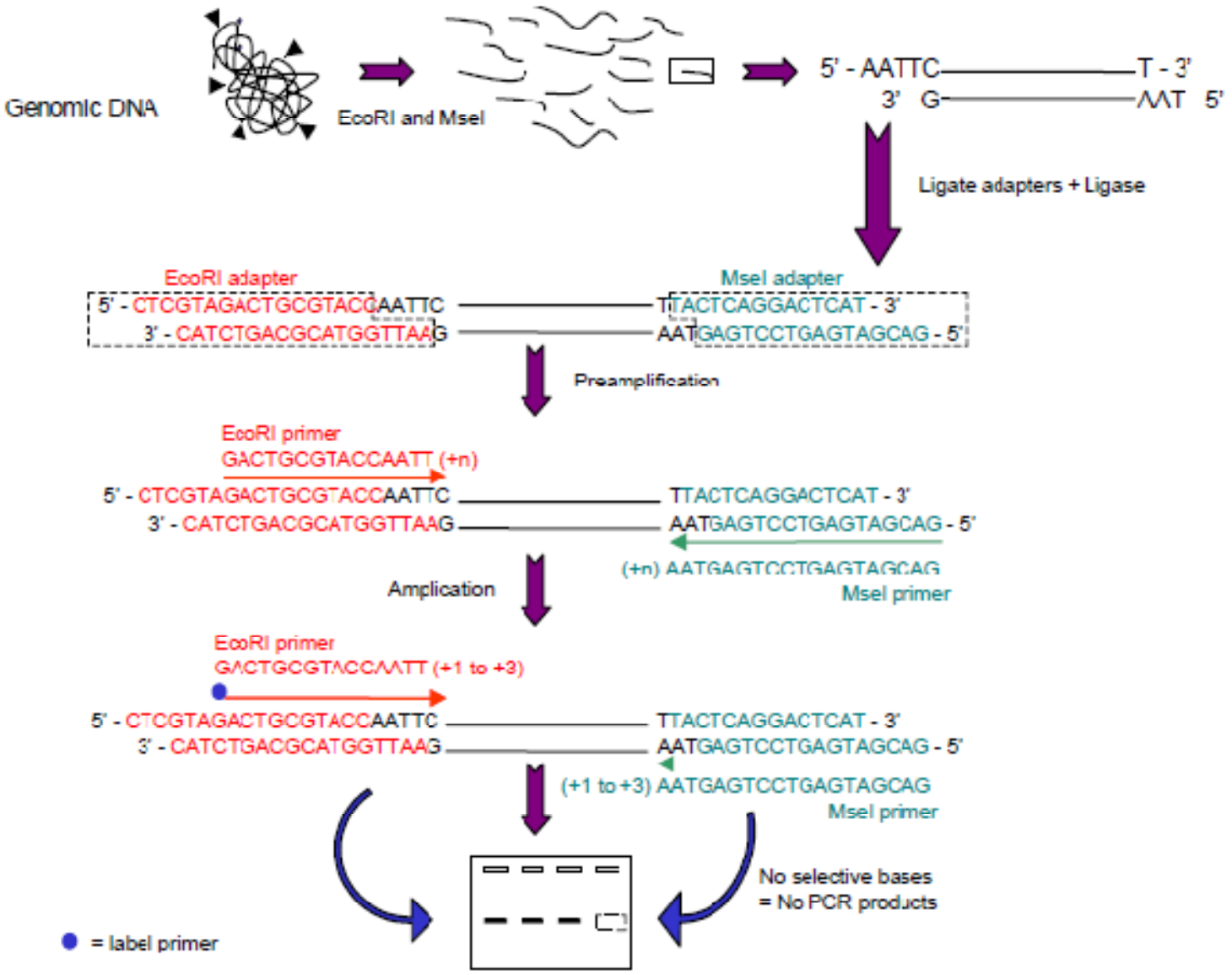


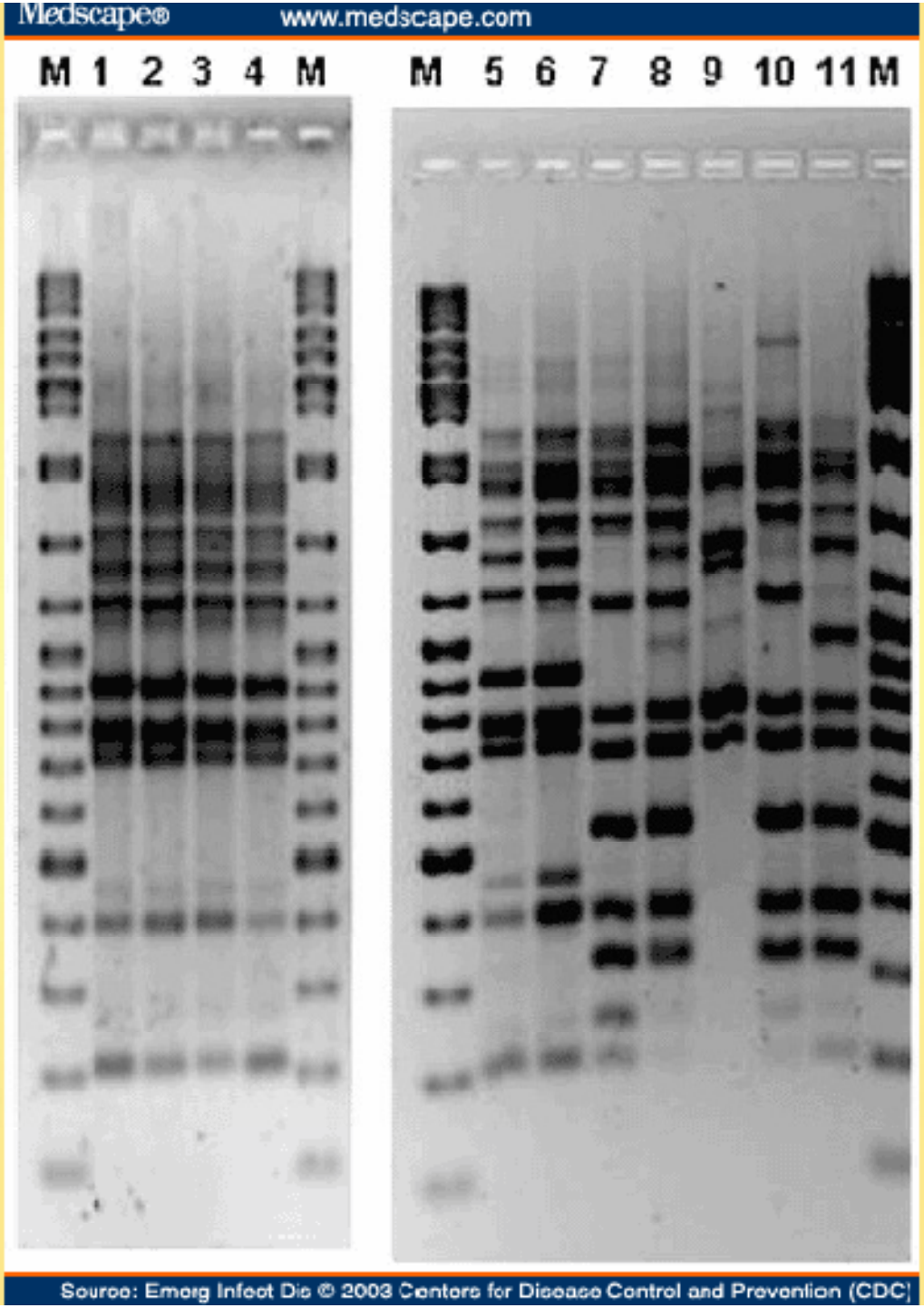
labelled DNA-probe

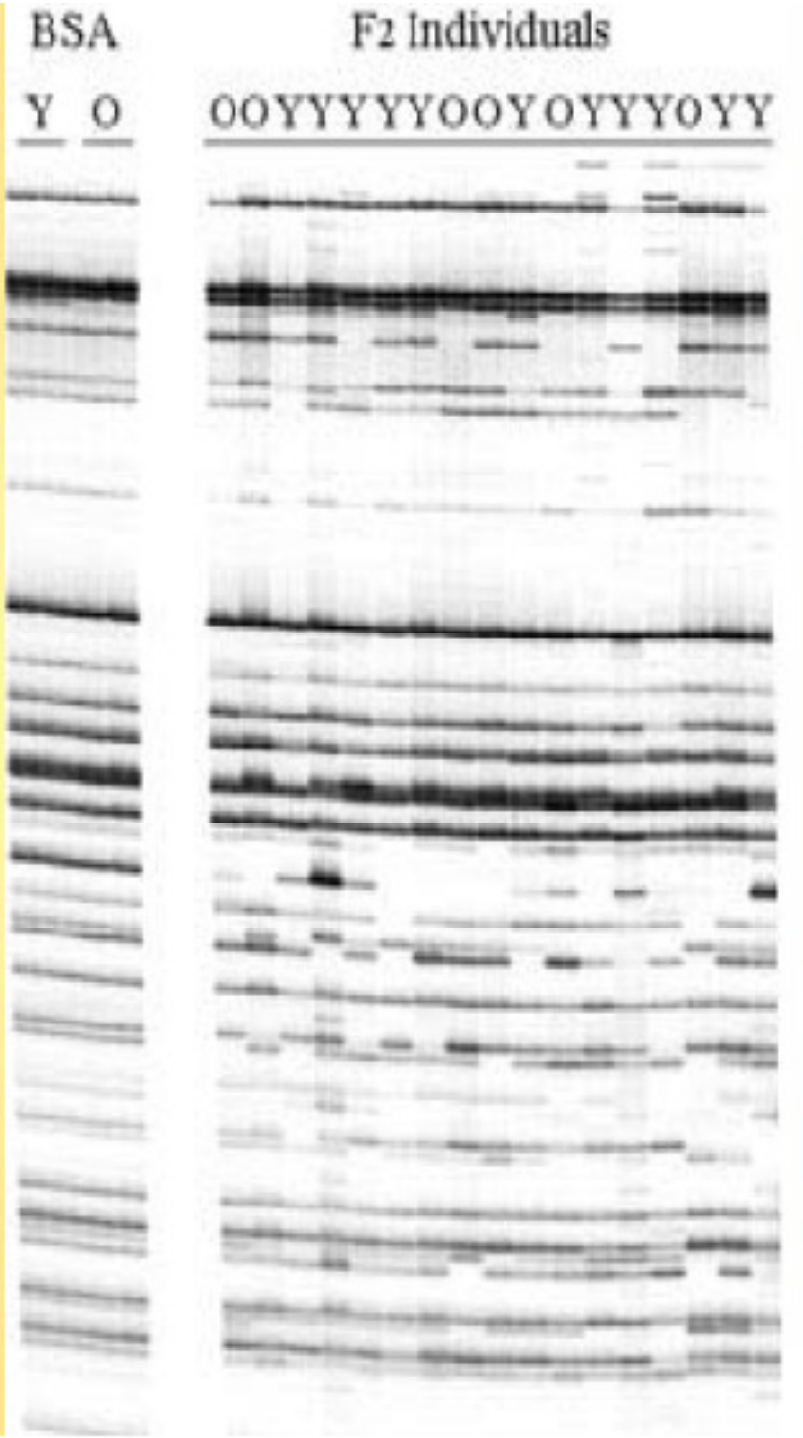
RFLP work flow

Example - RFLP in *Brassica*




Genomic DNA
EcoRI and MseI
5' - AATTC
T - 3'
3' G
AAT 5'
Ligate adapters + Ligase
EcoRI adapter
MseI adapter
5' - CTCGTAGACTGCGTACCAATTC
TTACTCAGGACTCAT - 3'
3' - CATCTGACGCATGGTTAAG
AATGAGTCCTGAGTAGCAG - 5'
Preamplification
EcoRI primer
GACTGCGTACCAATT (+n)
5' - CTCGTAGACTGCGTACCAATTC
TTACTCAGGACTCAT - 3'
3' - CATCTGACGCATGGTTAAG
AATGAGTCCTGAGTAGCAG - 5'
(+n) AATGAGTCCTGAGTAGCAG
MseI primer
Amplication
EcoRI primer
GACTGCGTACCAATT (+1 to +3)
5' - CTCGTAGACTGCGTACCAATTC
TTACTCAGGACTCAT - 3'
3' - CATCTGACGCATGGTTAAG
AATGAGTCCTGAGTAGCAG - 5'
(+1 to +3) AATGAGTCCTGAGTAGCAG
MseI primer
No selective bases
= No PCR products
= label primer


Medscape®
www.medscape.com
M 1 2 3 4 M
M 5 6 7 8 9 10 11 M
Source: Emerg Infect Dis © 2003 Centers for Disease Control and Prevention (CDC)

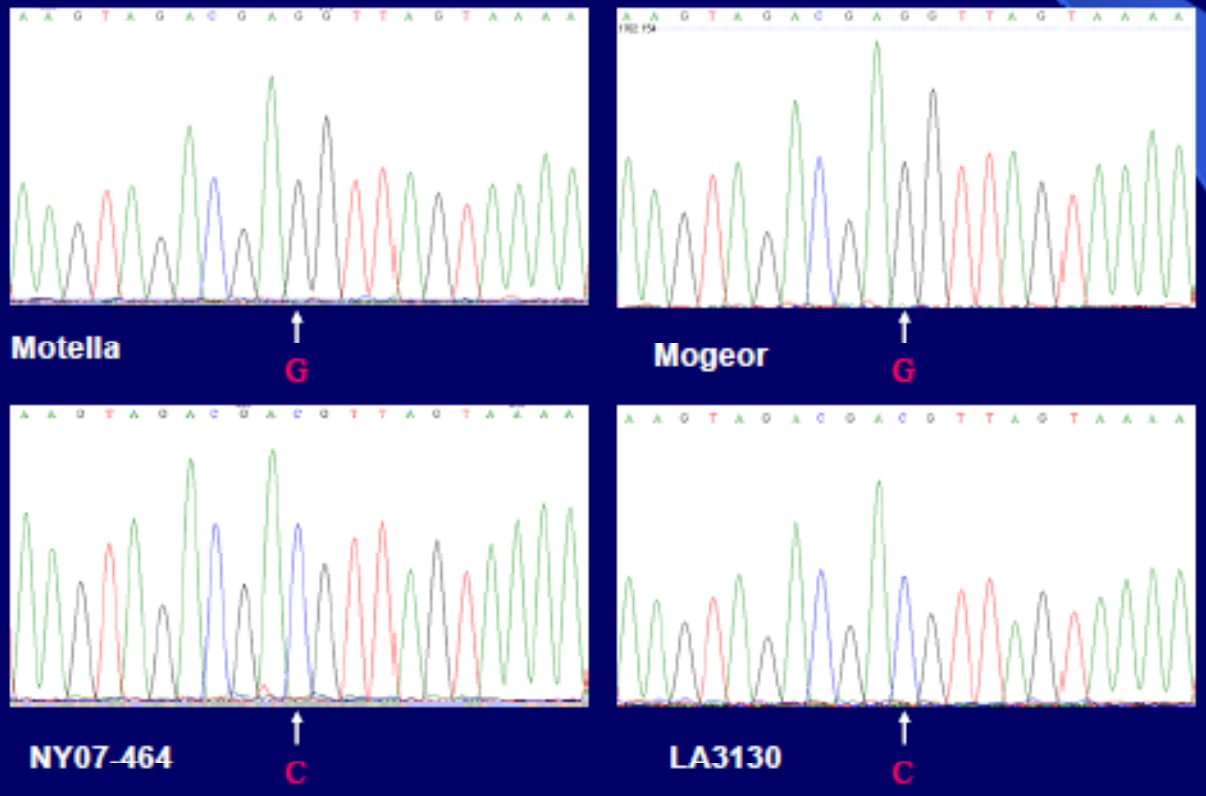


AFLPs

Single Nucleotide Polymorphism (SNP)

An example for Mi

Motella/LA2823	Mi	AAGTAGACGAGGTTAGTAAAAT
Mogeor/LA3471	Mi	AAGTAGACGAGGTTAGTAAAAT
NY07-464	mi	AAGTAGACGACGTTAGTAAAAT
LA3130	mi	AAGTAGACGACGTTAGTAAAAT



Marcatori funzionali

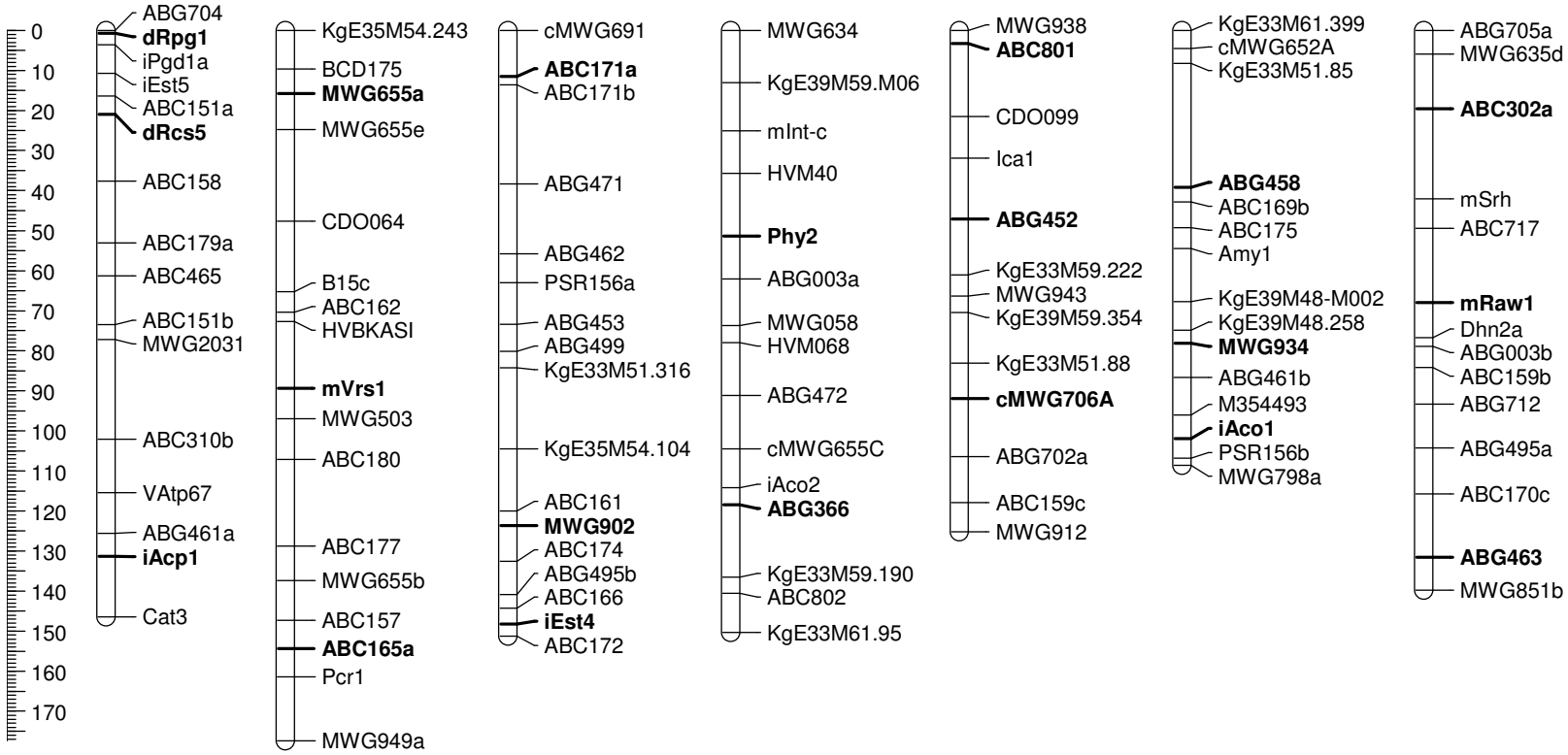
La individuazione di SNPs (polimorfismi di singoli nucleotidi), INDELS (Inserzioni e delezioni), riarrangiamenti di singole sequenze dovute anche a trasposoni aprono la strada per la identificazione di "marcatori funzionali" e cioé mdificazioni di sequenza in geni di cui é nota la funzione .

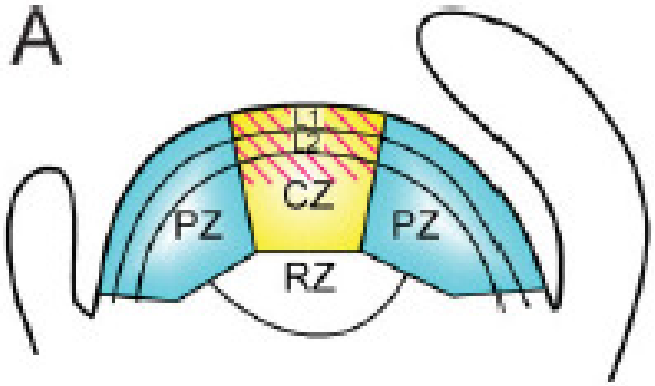
I marcatori funzionali possono essere in sequenze codificanti ma anche non codificanti:

a) Nelle sequenze codificanti una mutazione può o no portare a proteine con diversi livelli di attività

b) Nelle sequenze non codificanti le mmutazioni possono portare a modificazioni della regolazione dei geni

Una mappa In orzo





Stem cells(SC) are in the hatched area
CZ=central zone
PZ=peripheral zone
L1: epidermis
L2: sub-epidermal
Pn= primordia

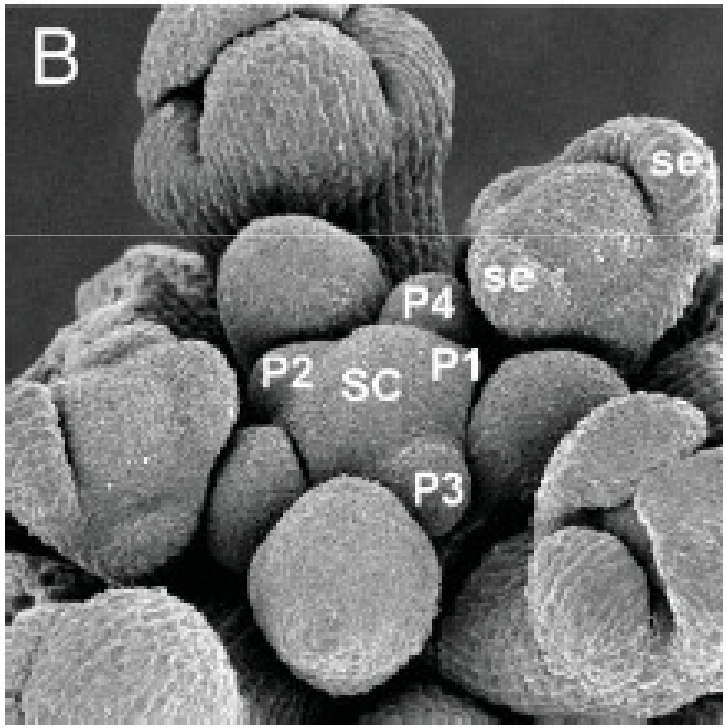


Figure 2. The *Arabidopsis* shoot meristem. **A:** Based on cytohistological studies the SAM can be subdivided into layers and zones.[5,8,9] The central zone (CZ), which resides at the summit of the SAM contains relatively large and slightly more vacuolated cells, which divide relatively infrequently. Surrounding the CZ is the peripheral zone (PZ) and underneath the rib zone (RZ). The PZ consists of small cells that divide frequently. The cells in the RZ and contribute primarily to the central tissues of the shoot axis. Higher plant shoot meristems have a tunica-corpus structure. In most angiosperms, the tunica consists of two layers (L1, L2) where the cells generally divide in anticlinal orientation (perpendicular to the surface) and thus form two sheets of clonally distinct tissue.[36] The L1 gives rise to the epidermis and the L2 gives rise to the subepidermal layer. Cells in the underlying L3 (corpus) divide periclinally and anticlinally and generate the internal tissues of lateral organs and shoot axis. The presumed stem-cell position is indicated by the hatched area. **B:** Scanning electron micrograph of an *Arabidopsis* inflorescence meristem. The stem cells (SC) reside in the center of the meristem. At the periphery of the meristem, formation of organs (here: flower buds) takes place. By convention, primordia are named P1, P2, P3 etc. with P1 being the youngest visible primordium and P2 the second youngest etc. In older floral buds, formation of the first set of floral organs, the sepals (se), is visible.

From I.Baurle, 2003

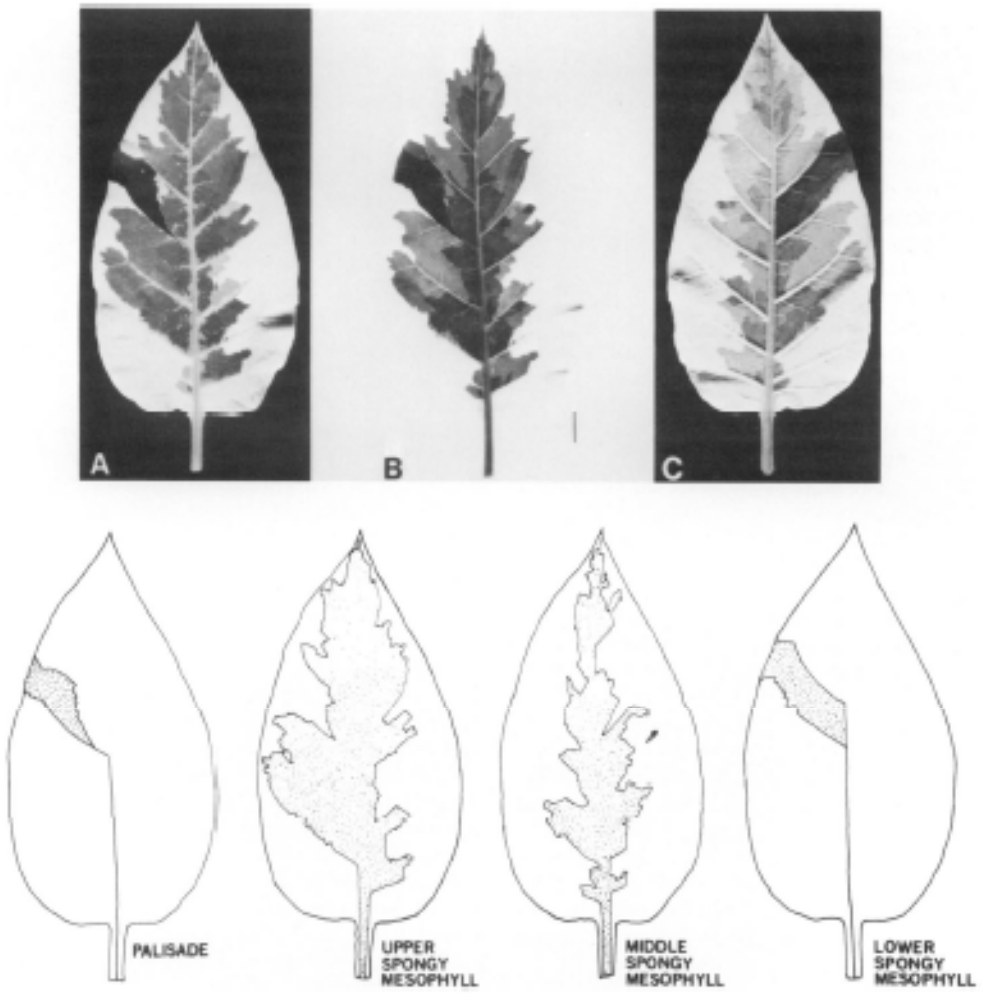


Fig. 1. The distribution of L2 (white) and L1 or L3 (green) tissue in the leaf blade of a green/white/green periclinal chimera of *Nicotiana tabacum* cv. Xanthi Nc. The epidermis of the leaf is not shown. A) leaf photographed with incident illumination with the adaxial surface of the leaf uppermost; B) transmitted illumination, adaxial surface uppermost; C) incident illumination, abaxial surface uppermost. The distribution of green and white tissue in different layers of the lamina was determined from the difference in the intensity of color in these layers when viewed with incident (A and C) or transmitted (B) illumination. Differences in color intensity revealed by incident illumination are related to distance of the green tissue from the uppermost surface of the leaf. Green sectors in the subepidermal layers of the leaf (palisade and lower spongy mesophyll) are distinctively darker than green cells in more internal spongy mesophyll layers. Green tissue in the upper spongy mesophyll is darker than green tissue in the middle spongy mesophyll when the adaxial surface of the leaf is illuminated; the reverse is true when the abaxial surface is illuminated. Variation in color intensity revealed by transmitted illumination is due to variation in the number of layers of green cells in different regions of the leaf. Thus, the dark green regions near the center of the leaf in C are due to the overlapping of green cells in the upper and middle spongy mesophyll layers. The histological basis of the color differences seen in these photographs was determined by examining free hand sections of water-infiltrated specimens. The green sector in the subepidermal layer of this leaf originated from either L1 or L3. Notice that L3 consistently contributes more cells to the upper spongy mesophyll than to the middle spongy mesophyll. This is probably because there are more periclinal divisions in the lower subepidermal layer of the lamina than in the upper subepidermal layer.

R.Poethig,1987

Table 1. Inheritance of green and albino offspring in the red mangrove plastid periclinal chimera

	Branches with			
	Periclinal-patterned leaves		Green leaves	
Collection	Albino embryos	Green embryos	Albino embryos	Green embryos
1992	16	0	0	57
1995	21	0	0	165
Total	37	0	0	222