

Brassica cytogenetics



Sue Armstrong

Retired

Elaine Howell

Gareth Jones

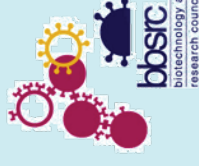
Steve Price

Mike Kearsey

Graham King

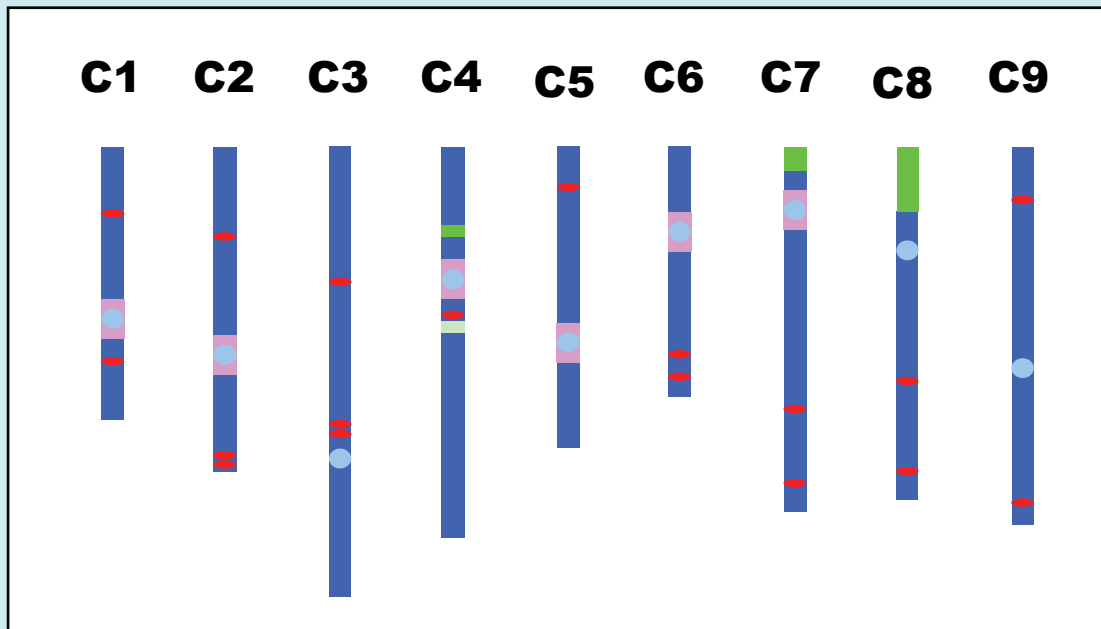
Many at Warwick HRI

D. Lydiate, I. Parkin, A. Sharpe, AAFRC



Brassica oleracea - C genome

Linked cytogenetic to genetic map



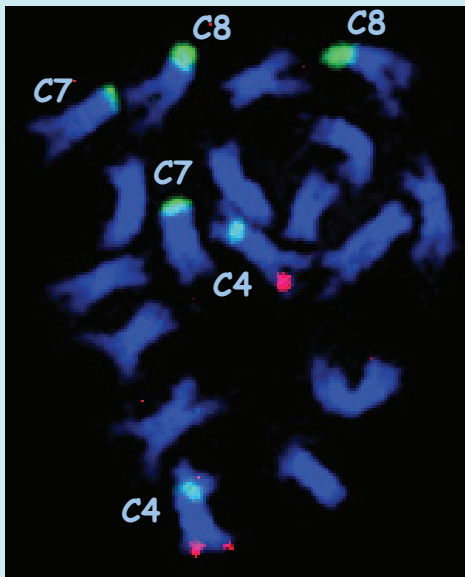
FISH - probes
mainly BACs with
genetically
mapped sequences

- mapped markers (BACs)
- pericentromeric heterochromatin
- 45S rDNA
- 5S rDNA
- centromere position

Brassica oleracea - C genome

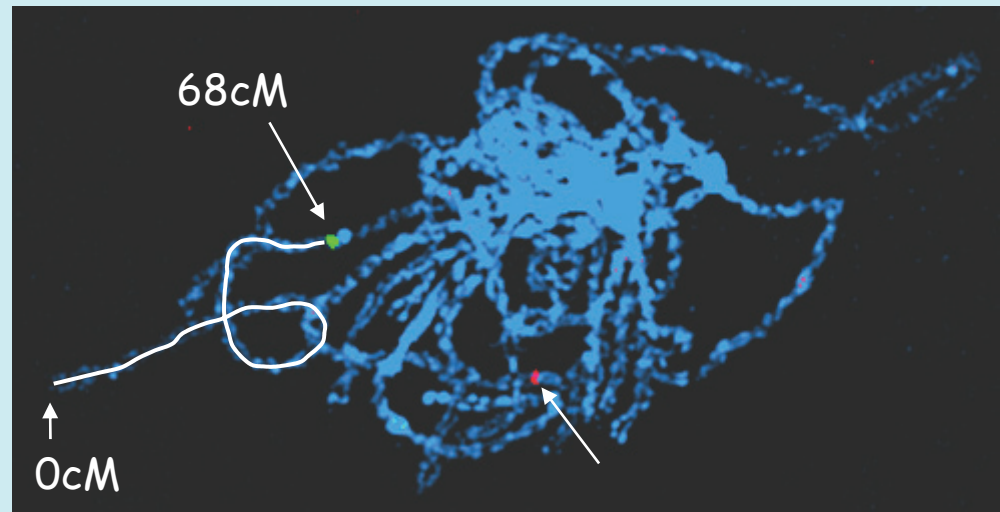
Use the cytogenetic map to determine the LG of a BAC

Mitotic metaphase



BAC (red) assigned to C4
45SrDNA (green)

Pachytene

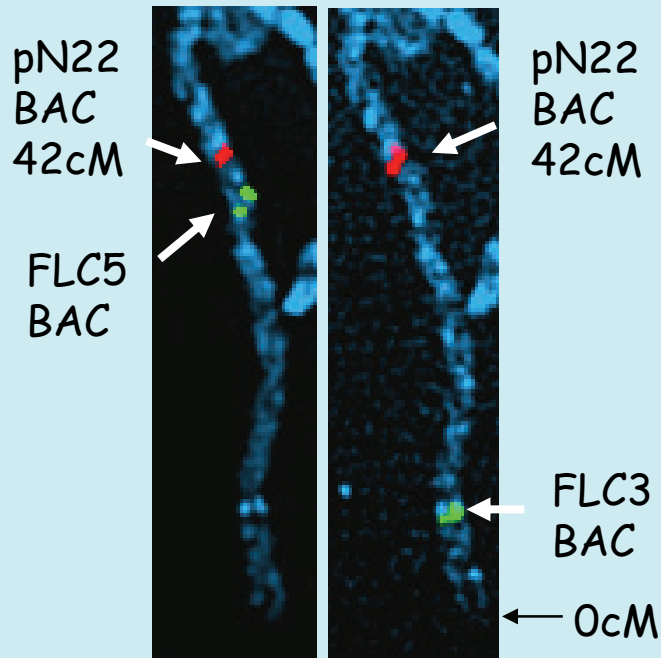


Green BAC on C3 (139cM)
Red BAC not at same location

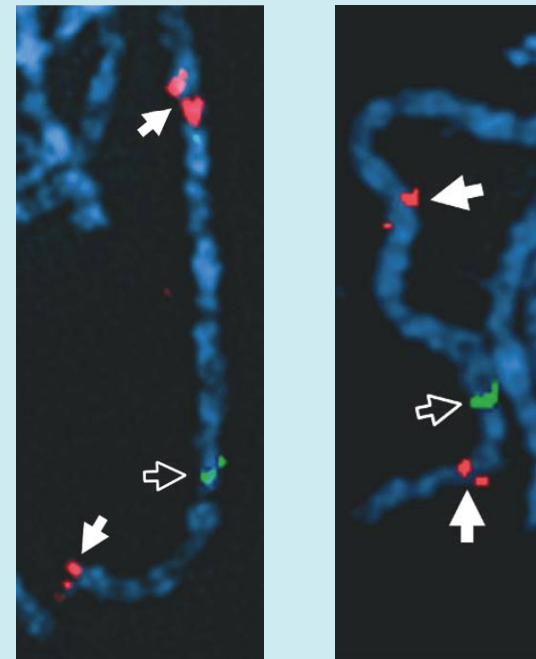
Brassica oleracea - C genome

BACs are site specific

Inverted duplication on C6



FLC BACs on C3

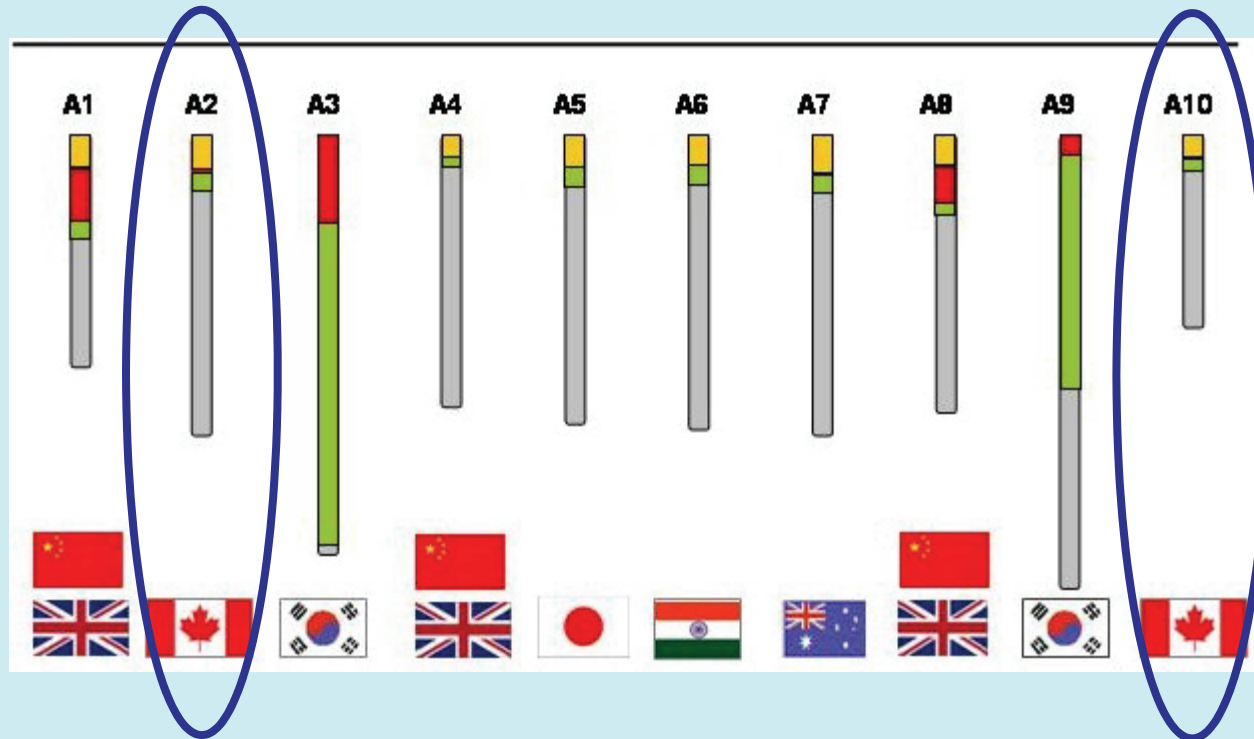


Arabidopsis BAC with
Brassica BAC as marker

(Genome 2005)

Brassica rapa - A genome

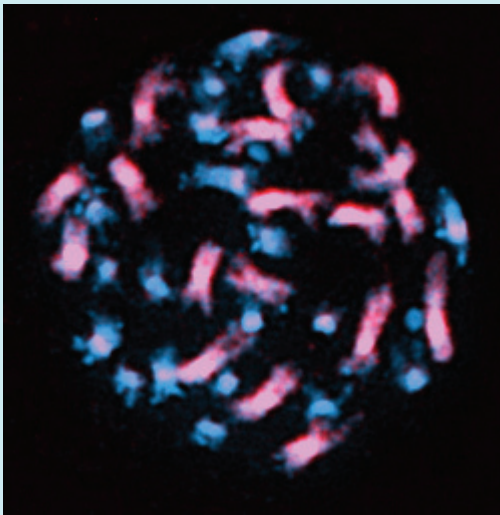
Checking some A2 and A10 BACs for AAFC Canada



- seed BAC in GenBank (Korea)
- BAC sequences in GenBank
- BAC sequences completed, not yet available in GenBank

Brassica napus - A and C

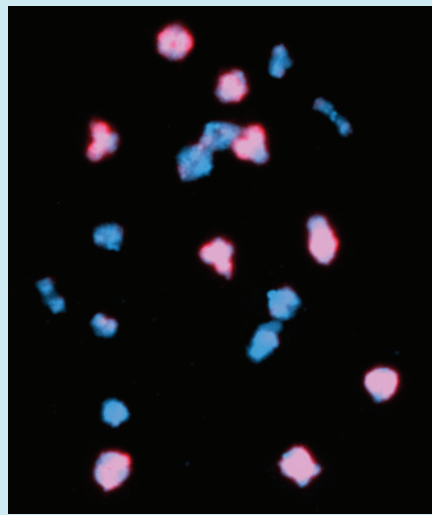
GISH - C genome chromosomes red



Mitotic metaphase

18 C red

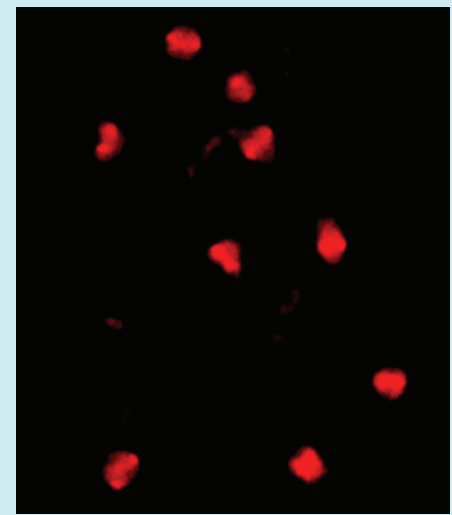
20 A blue



Diakinesis

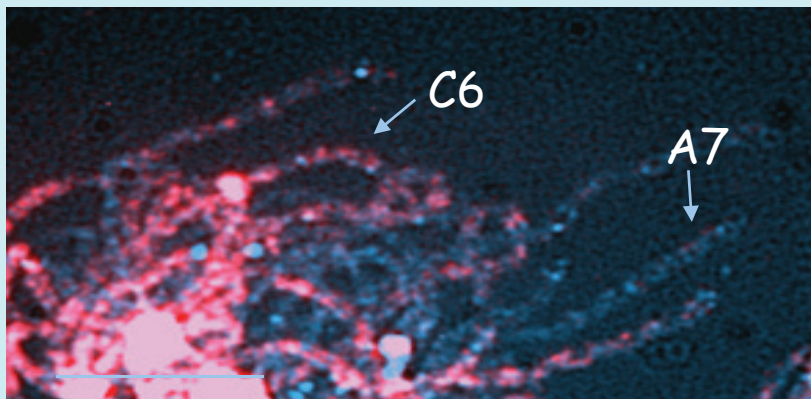
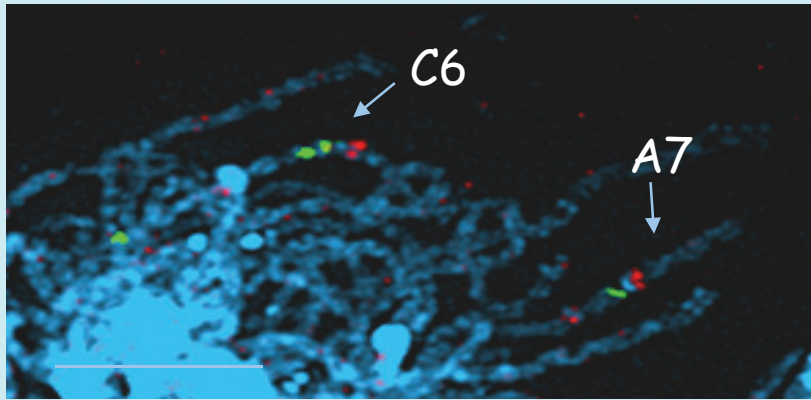
9 C bivalents red

10 A bivalents blue



Brassica napus - A and C

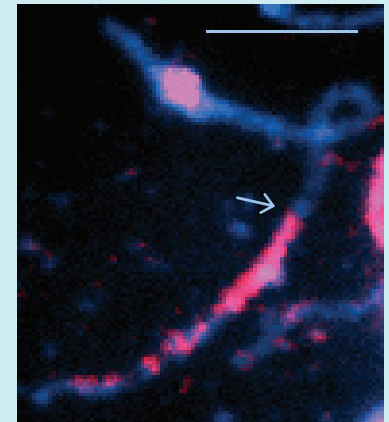
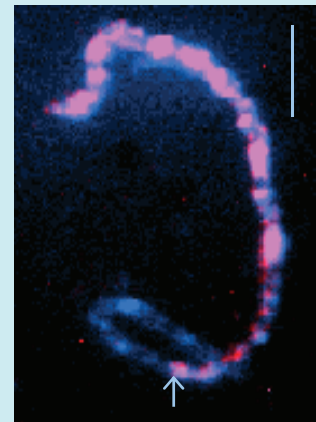
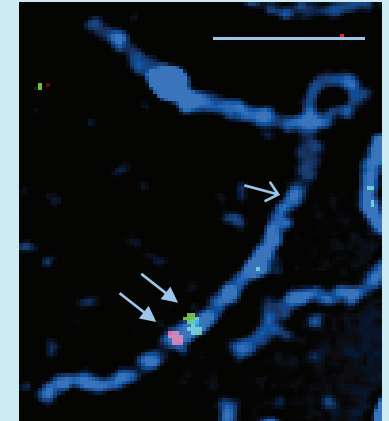
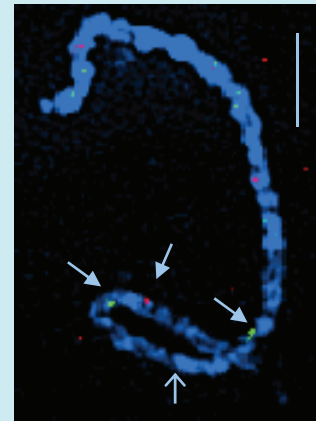
BolC6 BACs - on BnaC6 and fainter on homoeologous segment of BnaA7



Westar - reciprocal translocation

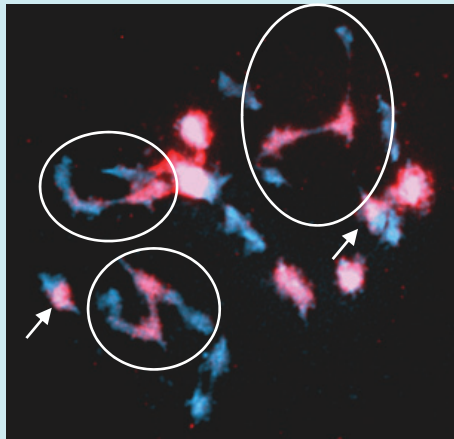
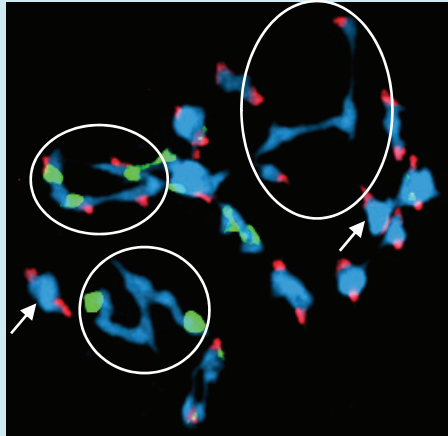
C6 (A7)

A7 (C6)



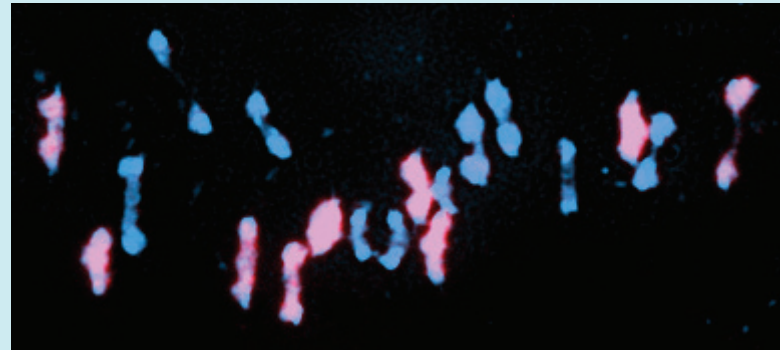
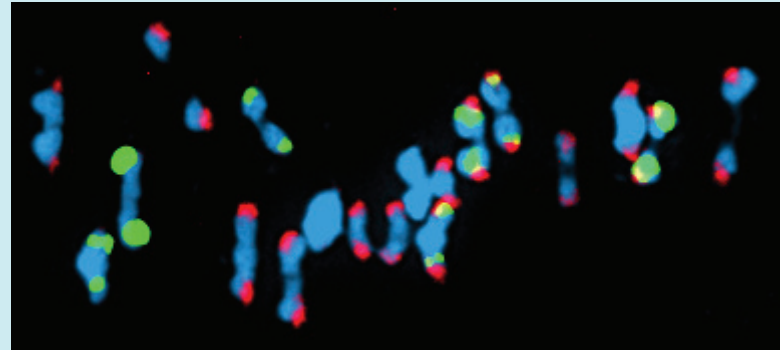
Brassica napus - pairing

Synthetic napus



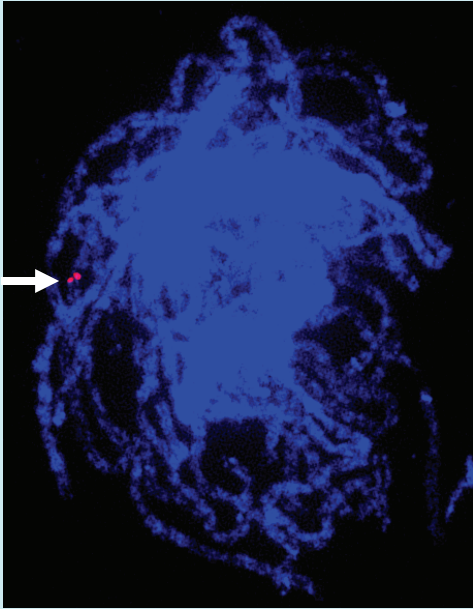
3 ACCA quadrivalents
2 AC bivalents

Normal napus



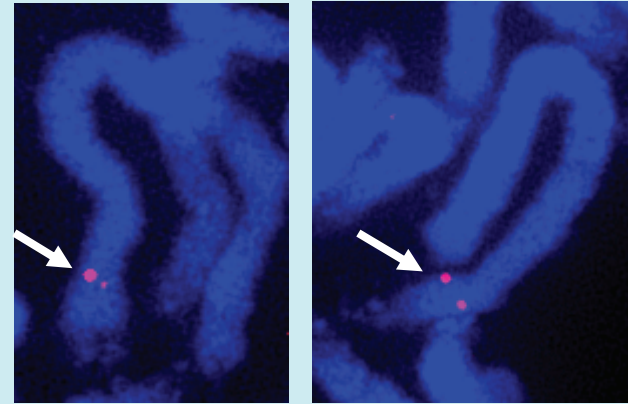
19 bivalents
10 AA and 9 CC

Brassica napus and *Silene*



This *B. napus* BAC is
site specific

~ 100kb



Silene latifolia IL25
Y chromosome

5kb genic probe