

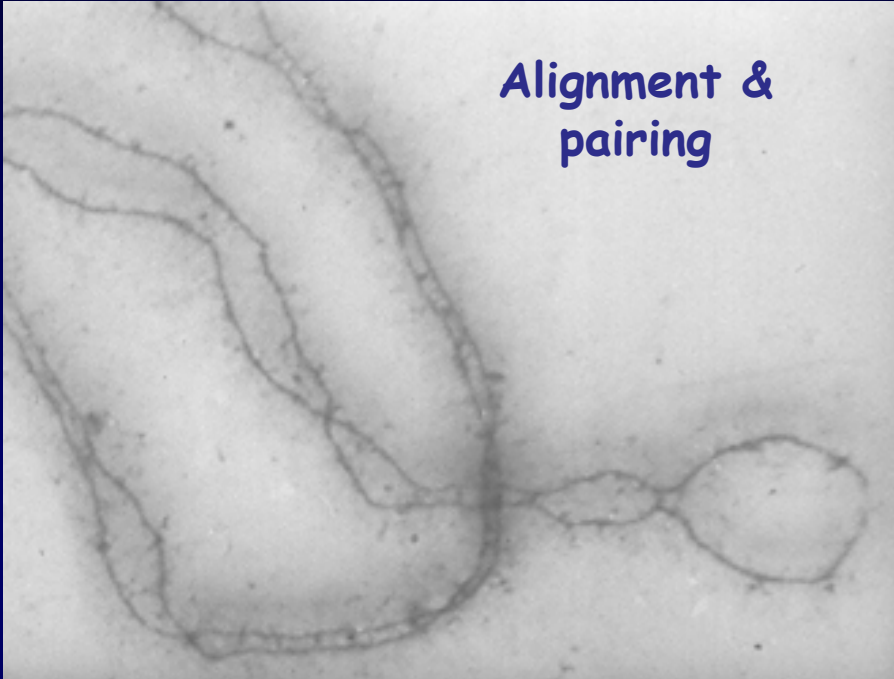


Proteomic analysis of *Brassica* meiocytes provides insights into the control of meiotic recombination

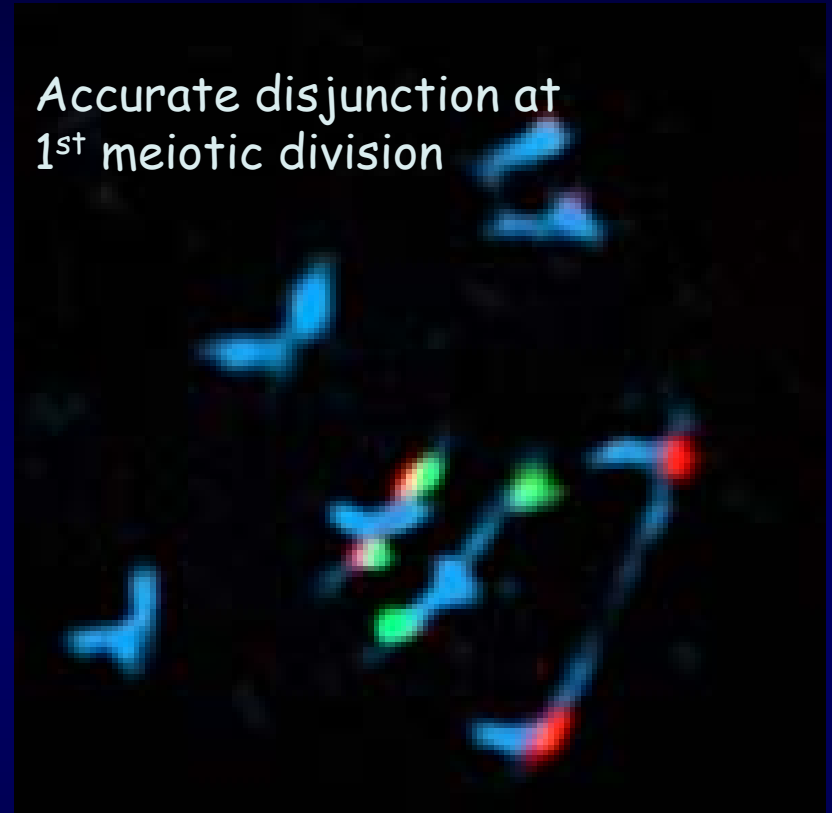


Inter-homolog recombination

Alignment & pairing



Accurate disjunction at 1st meiotic division



Homologous chromosomes

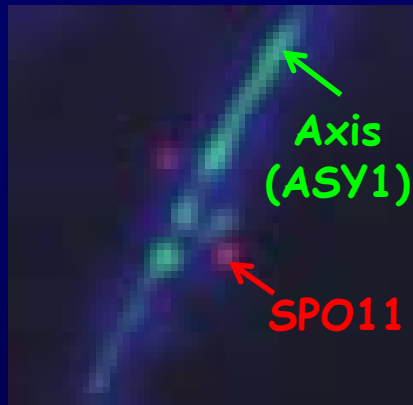
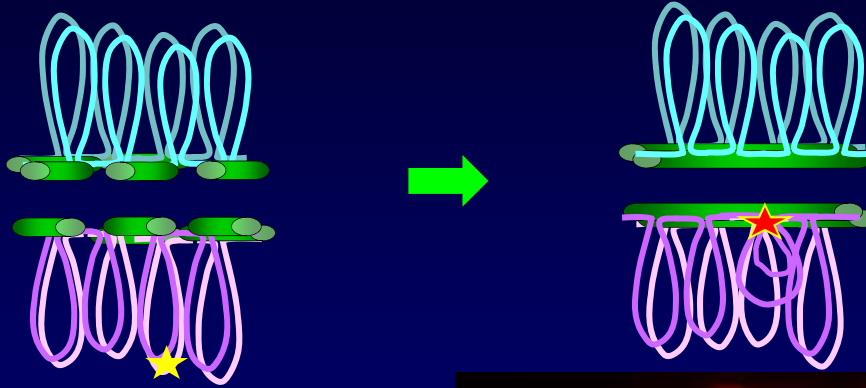
Centromeres

Chiasmata

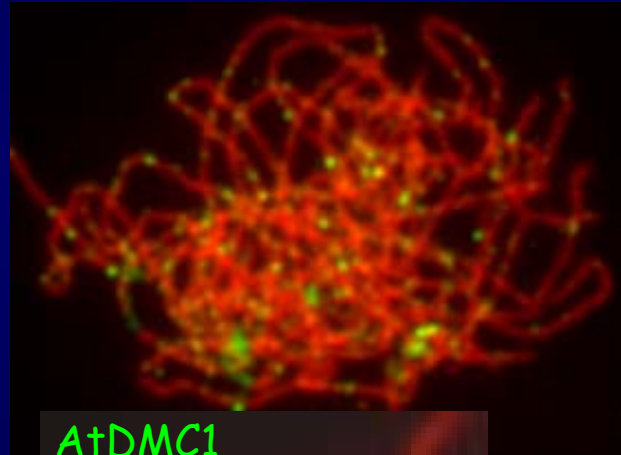
CO/chiasma formation
- genetic variation

- inter-homolog v inter-sister
- CO frequency
- CO distribution / interference

Recombination occurs in the context of the chromosome axes

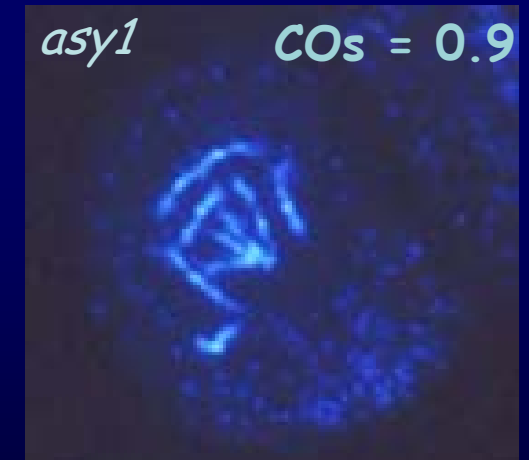
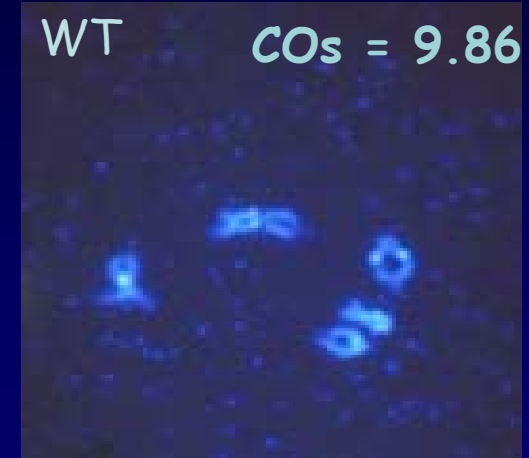


DSB sites are in chromatin loops



A+DMC1
A+ASY1

Early recombination intermediates associated with the axial elements

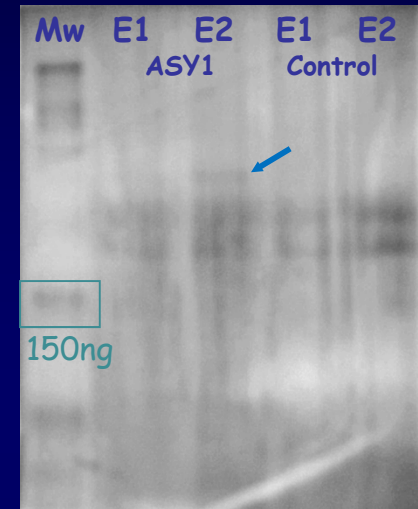


Isolation of *Brassica* meiotic complexes & analysis using mass-spectrometry

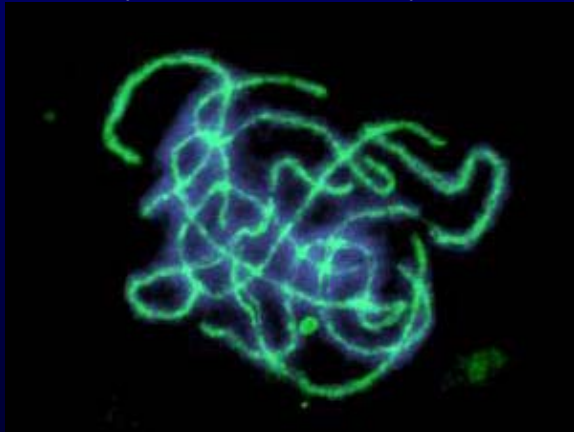
Arabidopsis Brassica



Brassica pachytene
meiocyte



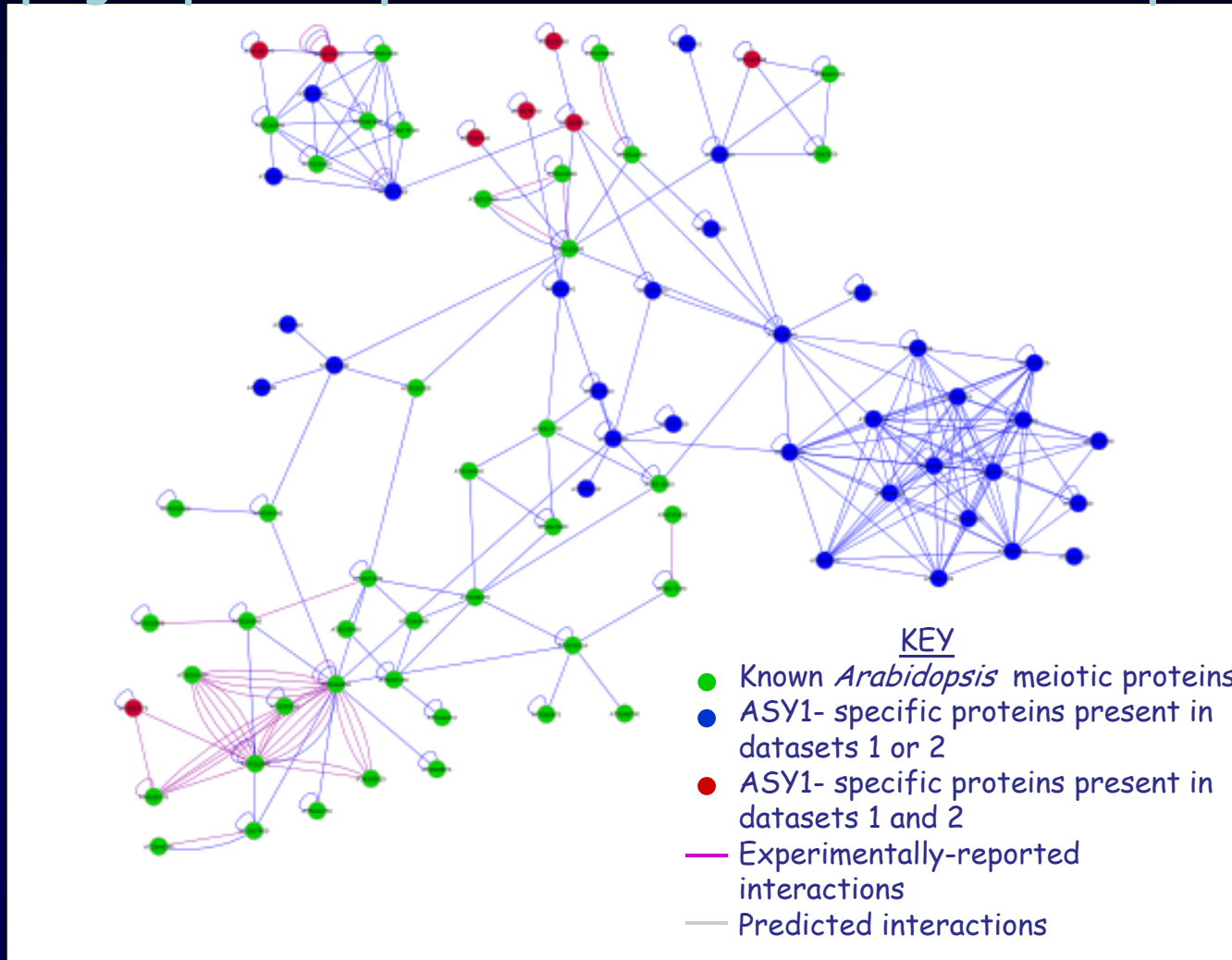
Localization of **ASY1** in *Brassica*
~77% sequence identity with AtASY1



MS analysis - *B. oleracea*

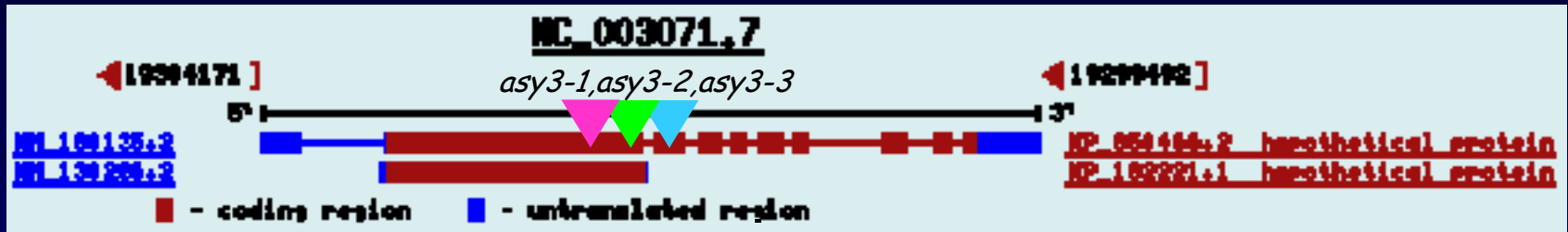
Total proteins =	310
ASY1 specific =	189
anthers -	32
meiocytes -	81
anthers +	76
meiocytes	

Developing a protein-protein interaction network for plant meiosis

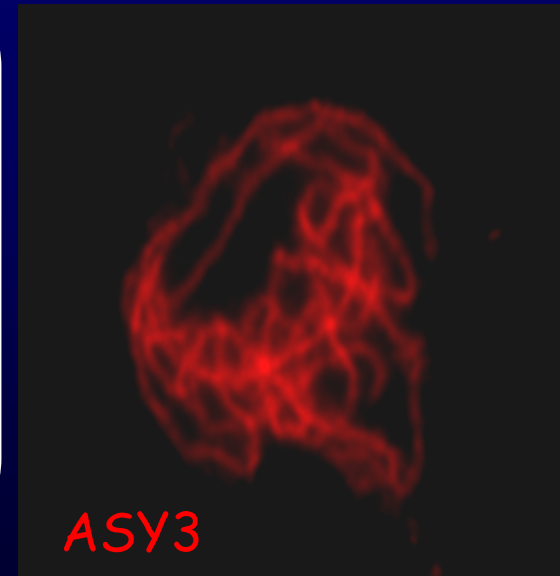
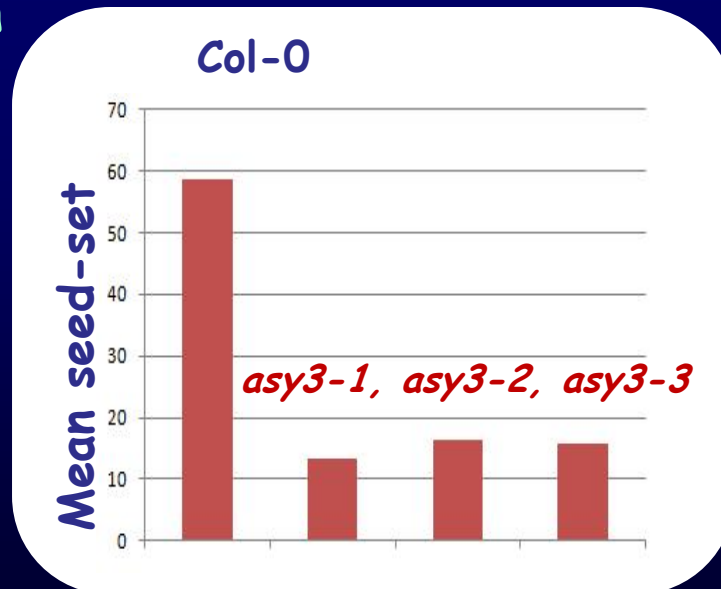


Example network produced using PAIR, the Predicted Arabidopsis Interactome Resource (Lin *et al.* 2011), which incorporates gene co-expression, domain interaction, shared GO annotation, colocalisation, phylogenetic profile and interolog data using public-source databases such as BioGRID, IntAct, BIND and TAIR. Of the ASY1-specific proteins, 41 can be 'networked' with known meiotic proteins.

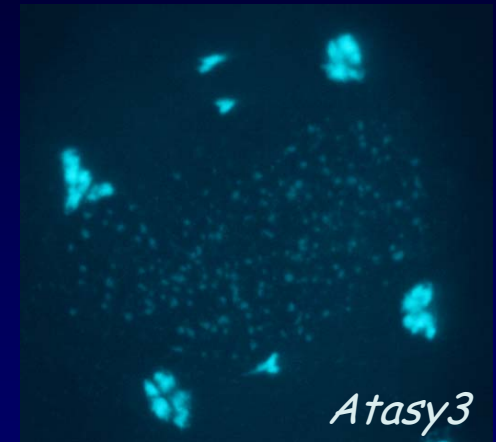
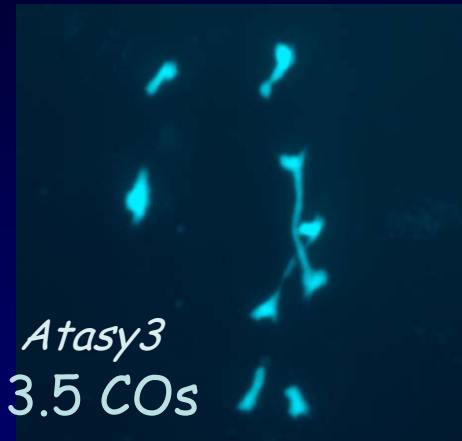
AtASY3 (Asynaptic 3) - a novel axis component



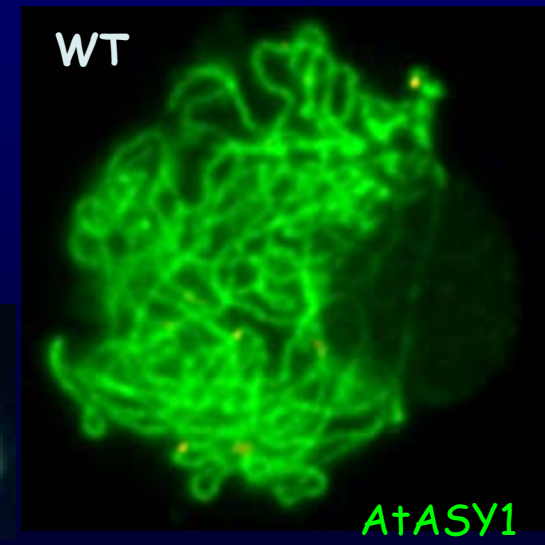
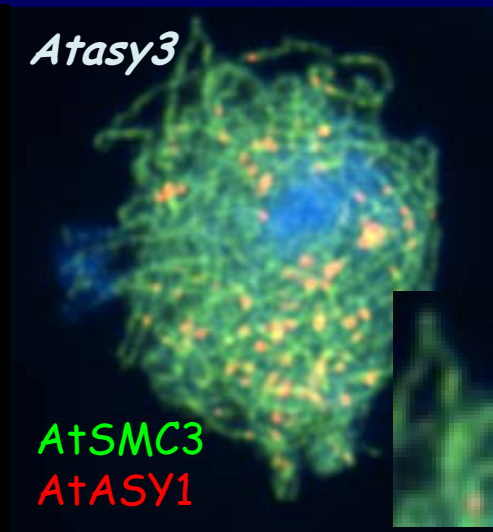
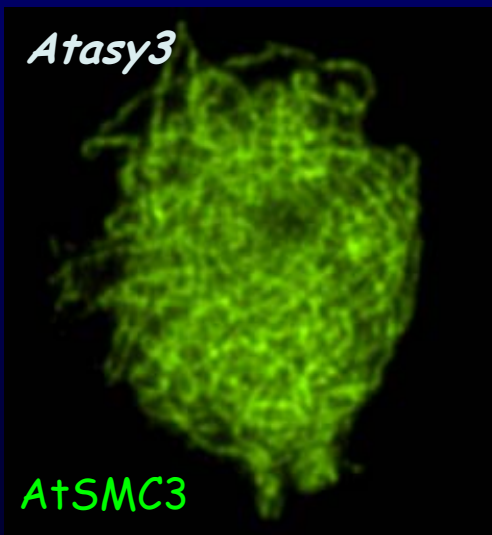
Fertility is reduced in *Atasy3* mutants.



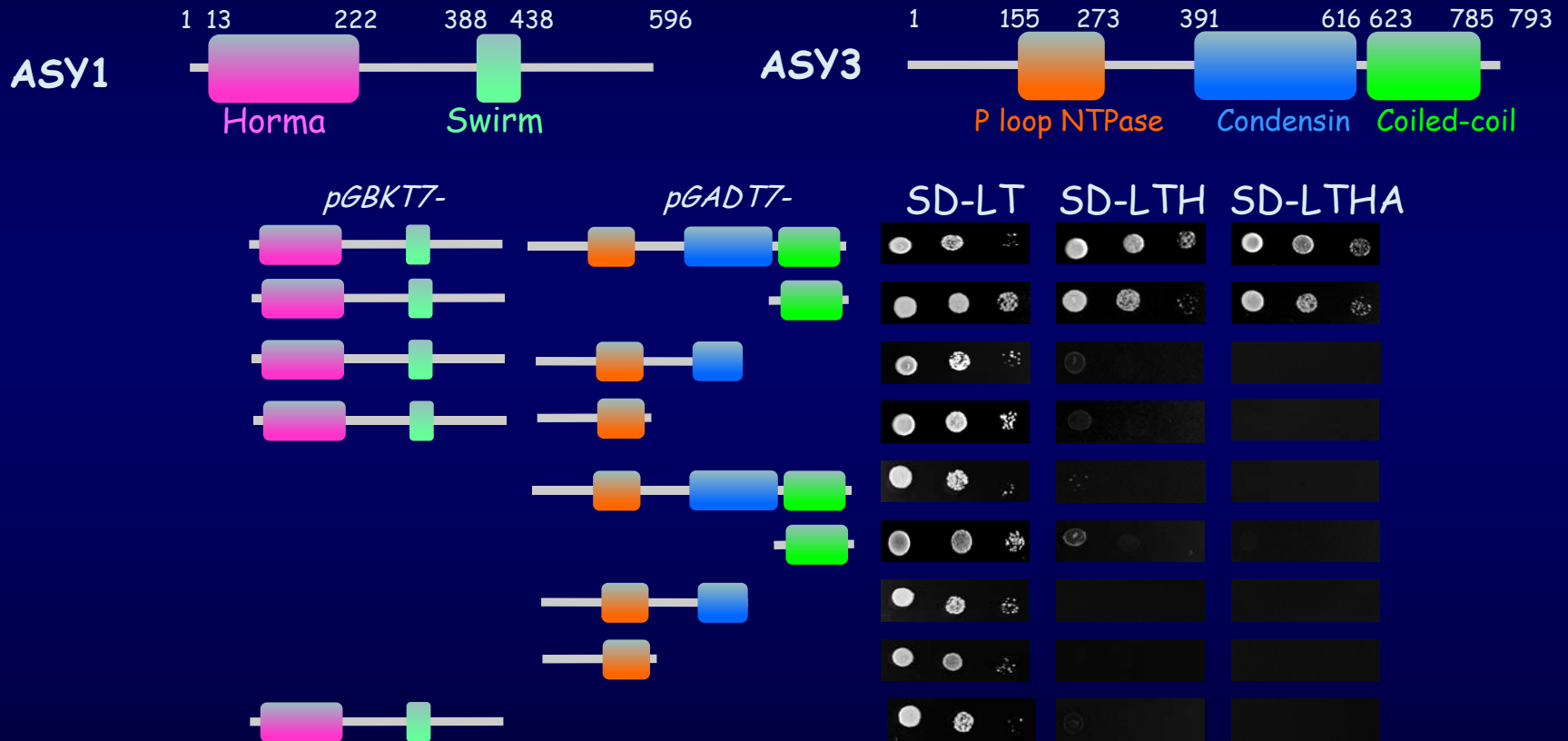
Reduced crossovers in *Atasy3*



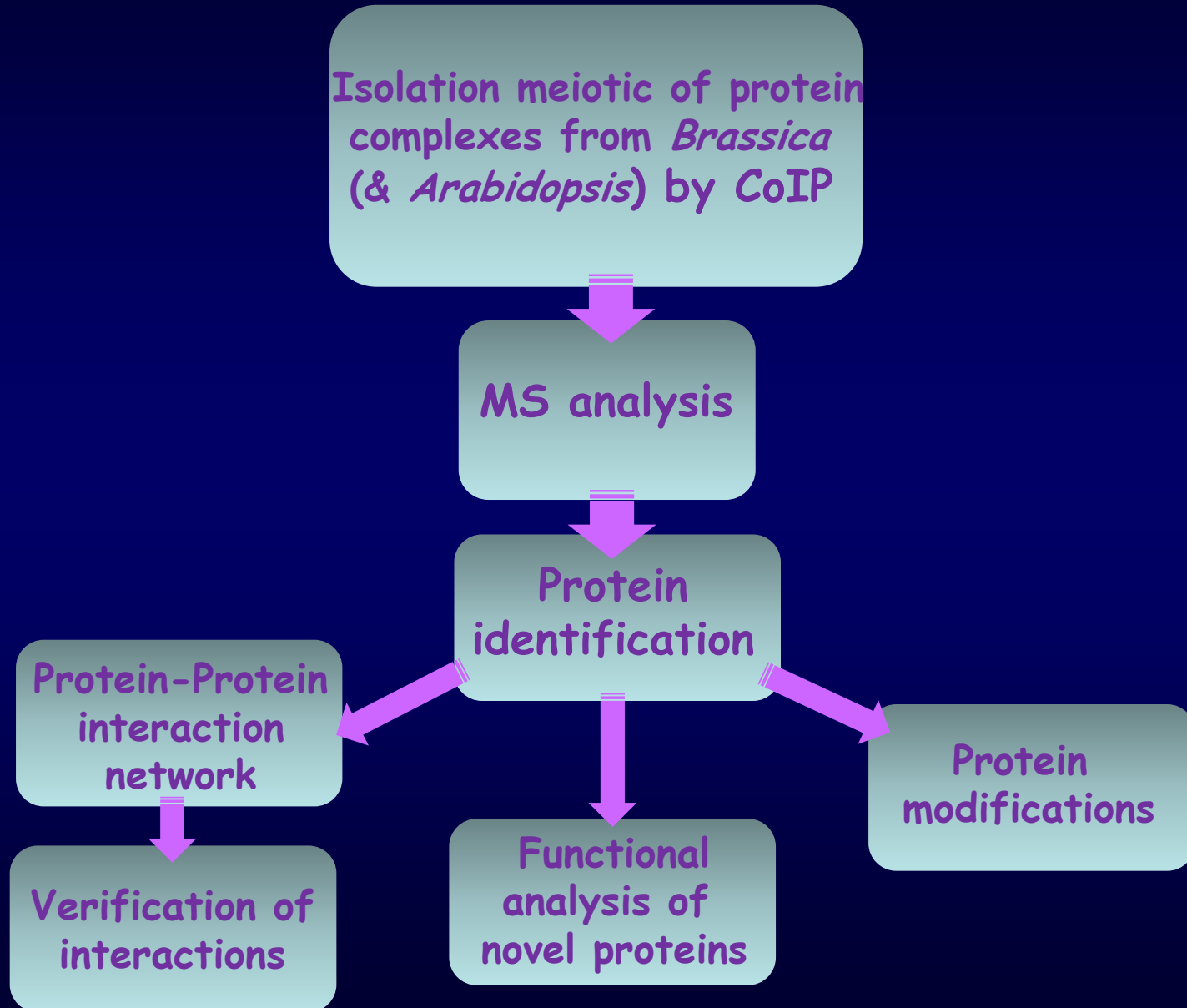
Localization of AtASY is compromised in *Atasy3*



The coiled-coil domain of ASY3 is required for interaction with ASY1



Summary



Meiosis in Birmingham

Chris Franklin / Sue Armstrong

James Higgins

Kim Osman

Jianhua Yang

Elaine Howell

Sarah Smith

Maheen Ferdous

Komsun Nuntasoonorn

Christophe Lambing

Amrit Sandhu

Ruth Perry

Steve Price

Collaboration

Elisabeth Roitinger IMP Vienna

Karl Mechtler

Thanks to:
Graham King
Chris Love

Support

