

Multinational *Brassica* Genome Project

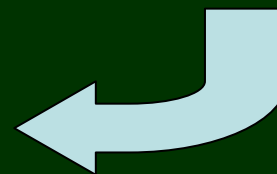
Maximising interaction from national R & D communities

- National Research communities
 - Universities
 - Institutes
 - Stakeholders and industry
 - breeders
 - farmers, advisors, extension
 - end-users

MBGP Steering Committee



Common Goals
Prioritise resources



Multinational *Brassica* Genome Project



- Focus for development of global *Brassica* genomics
- Assist in co-ordination of public-domain resources
- Encourage interchange of information for harmonisation of national and international programmes
- Communicate and disseminate priorities and any agreed criteria or standards
- Publicise on www.brassica.info
- Development of a White Paper



Multinational *Brassica* Genome Project

Achievements: resources now in public domain

- Genetic maps and populations
- Collation of public-domain SSR markers
- ESTs in public repositories
- BAC libraries and physical (BAC) contig maps
- Initiation of *B. rapa* **sequencing project**
- Analysis of *B. oleracea* shotgun sequences
- www.brassica.info website and links
- “White Paper” , with national profiles



Multinational *Brassica* Genome Project

Additional objectives and opportunities:

- Standardised screening of Diversity (diversity sets)
- Induced variation (**TILLING**)
- Transcriptional micro-arrays (**GeneChip[®]**)
- Standardisation of nomenclature
- Information registries and exchange standards
- Integration of genetic and genomic maps : from QTL to gene



Multinational *Brassica* Genome Project

B. rapa Sequencing Project – progress to date

- Homozygous Chinese cabbage Chiifu-401
- Large BAC libraries (Korea)
- 92, 000 + BAC-ends sequenced **(20% genome)**
 - multinational effort (Korea, UK, Australia, Germany, Canada)
- Reference linkage map (CKDH) + alignment to existing maps
- Chromosome assignment : BAC-by-BAC sequencing of gene-space
- Seed BACs being sequenced (Korea) ~600 (+10% genome)
 - + gene space R9 chromosome (release expected June 2006) + R3 (+20% genome)

UK Proposal (JIC, RRes, WHRI) under consideration (BBSRC AgriFood)
partners: BGI (China) and TIGR (USA)

Gene space of 2 Chromosomes (R1 and R8)



Affymetrix *Brassica* community GeneChip®

- meeting PAG Jan 2006
 - 100,000 ESTs in GenBank + 30,000 pledged
 - deadline June 30 for contributions
- teleconference May 2006
 - Canada consortia to decide (up to 250,000 more) by June
 - aim for genus gene cluster specific (95%)
 - Affymetrix aim to release by Dec 2006



MBGP TILLING Consortia

- Lars Østergaard (JIC) developing *B. rapa* resource (R-O-18)
- Other initiatives:
 - B. napus* Ningou7 (China)
 - B. napus* Tanto (France)
 - B. napus* DH12075 (Canada)
 - + ?
- Aim to share pools and access via registry



sharing information worldwide for

The Multinational *Brassica* Genome Project

tilling

Google Search

www.brassica.info

Introduction

MBGP

News

Research

People

Resources

This site has been established to collate and exchange information relating to *Brassica* genomics and genetics. More information here, including concept note for Genome Project, and the brassica.info e-mail discussion list

- [Reference LinkageGroup assignments](#)
- [Minutes from MBGP, Jan 2006](#)
- [Minutes from MBrSP, Jan 2006](#)
- [Affymetrix *Brassica* community GeneChip@ to be developed 2006](#)
- [Crucifer Genetics Workshop, 1-4 Oct 2006, Wageningen14th](#)
- [Sequencing update](#)
- [Draft White Paper](#)

Details of International and National *Brassica* research programmes

Information on *Brassica* researchers, the MBGP steering committee and conference organisers

Details and links to a wide range of *Brassica* experimental resources, including plants, reference populations, clone libraries, genetic markers

Background

In order to facilitate integration of information between genetic linkage maps constructed from different mapping populations and using different sets of molecular markers, it is important to be able to anchor to a commonly agreed set of chromosomes and ultimately to genome sequence. The MBGP Steering Committee has agreed to adopt the nomenclature originally described in (1,2) and considerable ongoing effort is currently focused in assigning additional existing linkage maps within this nomenclature system. The *Brassica rapa* sequencing project is also actively engaged in ensuring that the BAC seed contigs are anchored to genetic maps within this system (6, 12). This information has been compiled amongst others by G. King, G. Teakle, J. Kim and K. Suwabe

Details

species genome	reference linkage group / chromosome assignments			NIAB (Korea) NIAB (Korea) original chromosomes LGs		Suwabe et al. NVMTS (Japan) LGs
	<i>B. oleracea</i> C	<i>B. napus</i> AC	<i>B. rapa</i> A			
reference linkage groups		N1	R1	LG10	Chr8	6
		N2	R2	LG3	Chr6	8
		N3	R3	LG1	Chr2	1
		N4	R4	LG4	Chr3	10
		N5	R5	LG7	Chr5	3
		N6	R6	LG5	Chr4	2
		N7	R7	LG6	Chr7	4
		N8	R8	LG9	Chr9	7
		N9	R9	LG2	Chr1	5
		N10	R10	LG8	Chr10	9

previous nomenclature

O1	N11
O2	N12
O3	N13
O4	N14
O5	N15
O6	N16
O7	N17
O8	N18
O9	N19

reference 4, 5 1, 2 6, 7 7 8 9, 10

References

- 1Parkin et al. (1995) Genome 38:1122-1133
- 2Sharpe et al. (1995) Genome 38:1112-112
- 3Parkin et al. (2005) Genetics, 171: 785-781
- 4Bohuon et al. (1996) Theor. Appl. Genet., 93, 883-839, 1996
- 5Sebastian et al. (2000) Theor. Appl. Genet. 100:75-8
- 6Kim et al. (200-) submitted
- 7Kim et al., (2004) Joint Meeting of the 14th Crucifer Genetics Workshop and the 4th ISHS Symposium on Brassica, October 24-28, pp146, Poster
- 8Lim et al. (2005) Mol. Cells, 19:436-444
- 9Suwabe, K. et al., in press
- 10http://www.intl-pag.org/12/abstracts/P5e_PAG12_522.html
- 11Howell et al. Genome. 48(6): 1093-1103
- 12Choi et al., (200-) submitted

To minimise ambiguity, and maximise the ability to navigate between cytogenetic, linkage, physical and sequence maps the recommendation is to standardise reference to chromosomes in terms of standardised nomenclature: eg. "Chromosome O6" *sensu* ref 11; eg "Chromosome R9" is the first chromosome currently being [sequenced](#) in the Korean *B. rapa* sequencing project as a major contribution to the multinational effort.

Upcoming *Brassica* meetings worldwide

2006 Oct 1-4	15th Crucifer Genetics Workshop	Wageningen
2007 Jan 13	<i>Brassica</i> workshop (PAG XV)	San Diego
2007 March 26-30	12th International Rapeseed Congress	Wuhan, China
2008 Sept 8-12	ISHS <i>Brassica</i> Meeting + Crucifer Genetics Workshop	Lillehammer Norway