

Building Excellence in Genomics & Computational Bioscience



PolyMarker

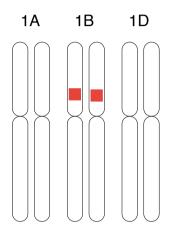
Genome Specific Primer Design

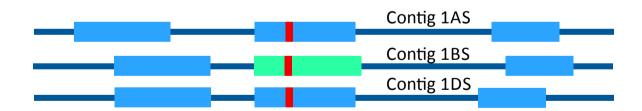
Ricardo H. Ramírez-González



The problem





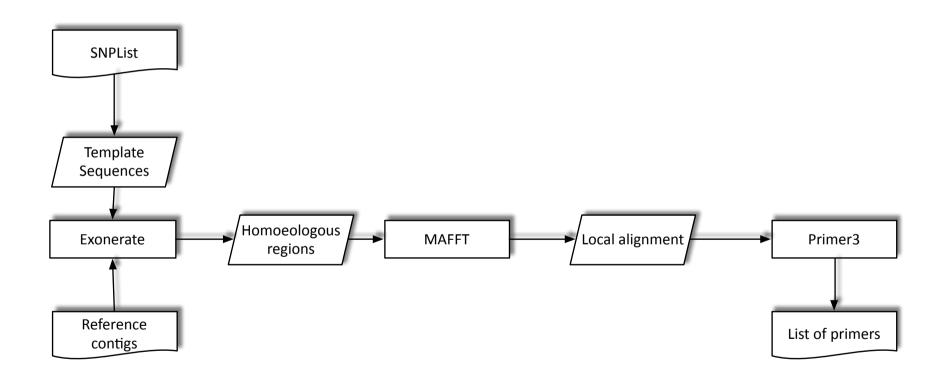






In Silico Primer Design

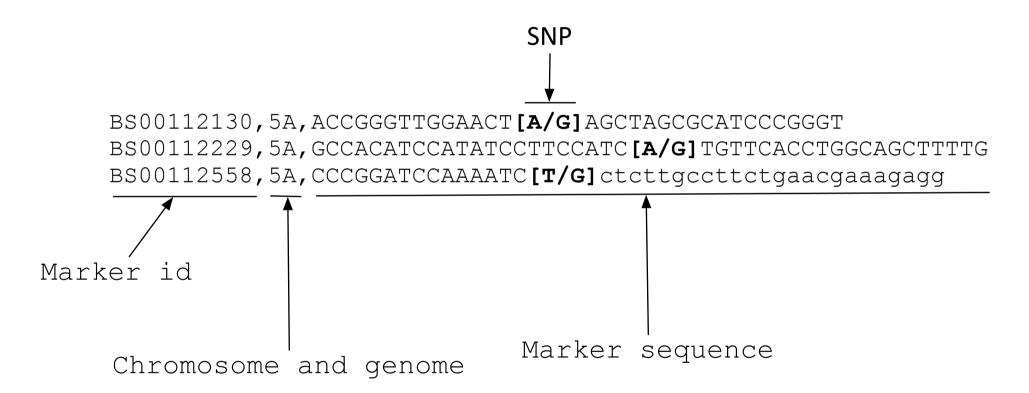


























	Save As: Markers5a.cs	v
FAVORITES ☐ Dropbox	Desktop Applications assemble.out	\$ Q
Desktop ramirezr Applications Documents Pictures SHARED ji-cfs2	bin Calibre Library Clash.mkv CLC_Data Desktop doc Documents Downloads	20121219_scripts.zip 678258843.epub 1216534110.full.pdf advplots.pdf all_runs.csv all_global_iactions.pdf atfinkelgate .jpg BgPq4snCllarge.jpeg
For Description		values (.csv) \$\displaysquare* uses commas to separate values in cells.
Options Con	New Folder	Compatibility check recommended Cancel Save







S52_G76C,1B,agtcgctccggcgtgatcctcatc[G/C]tcttcttcctcctctcgccgacc S32_C38G,1B,actatgttagtactagtttcatccaatgtg[C/G]tcagctgtatggtgat S52_T19G,1B,caaga[T/G]gtgttaacagcatacttcggagttccttcctacattgatagc





Template sequence



SNP-1 A cgcattt \mathbf{G} cgcgYgcgataccggcgcctKtg \mathbf{G} gaatatttgcagcgaaggcgtg

SNP-1 B cgcatttAcgcgYgcgataccggcgcctKtgAgaatatttgcagcgaaggcgtg

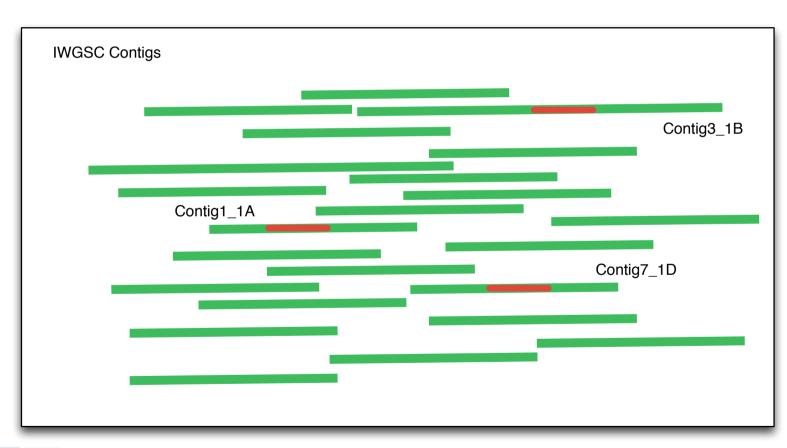




Global alignment



Template







Global alignment



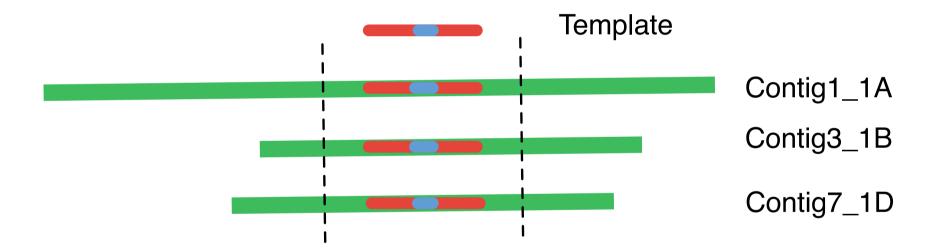
SNP-1 A cgcattt**G**cgcgYgcgataccggcgcctKtg**G**gaatatttgcagcgaaggcgtg
SNP-1 B cgcattt**A**cgcgYgcgataccggcgcctKtg**A**gaatatttgcagcgaaggcgtg
IWGSC-5A cgcatttGcgcgcgcgataccggcgcctTtgGgaatatttgcagcgaaggcgtg
IWGSC-5B cgcatttAcgcgcgcgataccggcgcctGtgGgaatatttgcagcgaaggcgtg
IWGSC-5D catttGcgcgTgcgataccggcgcctGtgGgaatatttgcagcgaaggcgtg





Local Alignment









Local Alignment



SNP-1 A cgcattt**G**cgcgYgcgataccggcgcctKtg**G**gaatatttgcagcgaaggcgtg
SNP-1 B cgcattt**A**cgcgYgcgataccggcgcctKtg**A**gaatatttgcagcgaaggcgtg
IWGSC-5A cgcatttGcgcgcgcgataccggcgcctTtgGgaatatttgcagcgaaggcgtg
IWGSC-5B cgcatttAcgcgcgcgataccggcgcctGtgGgaatatttgc---gaaggcgtg
C--atttGcgcgTgcgataccggcgcctGtgGgaatatttgcagcgaaggcgtg







SNP-1 A cgcattt**G**cgcgYgcgataccggcgcctKtg**G**gaatatttgcagcgaaggcgtg SNP-1 B cgcatttAcgcgYgcgataccggcgcctKtgAgaatatttgcagcgaaggcgtg $\mathsf{IWGSC} ext{-}\mathsf{5A}$ cgcattt $\mathsf{GcgcgcgcgataccggcgcctTtg}$ IWGSC-5B cgcatttAcgcgcgcgataccggcgcctGtgGgaatatttgc---gaaggcgtg $\verb|c--atttGcgcgTgcgataccggcgcctGtg| \textbf{G} gaatatttgcagcgaaggcgtg|$ **IWGSC-5D** MASK **SNP** non-homeologous







SNP-1 A cgcattt**G**cgcgYgcgataccggcgcctKtg**G**gaatatttgcagcgaaggcgtg SNP-1 B cgcatttAcgcgYgcgataccggcgcctKtgAgaatatttgcagcgaaggcgtg IWGSC-5A cgcattt**G**cgcgcgcgataccggcgcctTtgGgaatatttgcagcgaaggcgtg IWGSC-5B cgcatttAcgcgcgcgataccggcgcctGtgGgaatatttgc---gaaggcgtg c--attt**G**cgcgTgcgataccggcgcctGtgGgaatatttgcagcgaaggcgtg **IWGSC-5D** MASK **SNP** homeologous







SNP-1 A cgcattt**G**cgcgYgcgataccggcgcctKtg**G**gaatatttgcagcgaaggcgtg SNP-1 B cgcatttAcgcgYgcgataccggcgcctKtgAgaatatttgcagcgaaggcgtg IWGSC-5A cgcatttGcgcgcgcgataccggcgcctTtgGgaatatttgcagcgaaggcgtg IWGSC-5B cgcatttAcgcgcgcgataccggcgcctGtgGgaatatttgc---gaaggcgtg $\verb|c--atttGcgcg| \textbf{T} | \texttt{gcgataccggcgcctGtgGgaatatttgcagcgaaggcgtg}|$ **IWGSC-5D** MASK semi-specific







SNP-1 A cgcattt**G**cgcgYgcgataccggcgcctKtg**G**gaatatttgcagcgaaggcgtg SNP-1 B cgcatttAcgcgYgcgataccggcgcctKtgAgaatatttgcagcgaaggcgtg IWGSC-5A cgcatttGcgcgcgcgataccggcgcctTtgGgaatatttgcagcgaaggcgtg IWGSC-5B cgcatttAcgcgcgcgataccggcgcctGtgGgaatatttgc---gaaggcgtg c--atttGcgcgTgcgataccggcgcct**G**tgGgaatatttgcagcgaaggcgtg **IWGSC-5D** ----:---c-----T--&-----MASK specific







SNP-1 A cgcattt**G**cgcgYgcgataccggcgcctKtg**G**gaatatttgcagcgaaggcgtg SNP-1 B cgcatttAcgcgYgcgataccggcgcctKtgAgaatatttgcagcgaaggcgtg IWGSC-5A cgcatttGcgcgcgcgataccggcgcct**T**tgGgaatatttgcagcgaaggcgtg IWGSC-5B cgcatttAcgcgcgcgataccggcgcctGtgGgaatatttgc---gaaggcgtg c--atttGcgcgTgcgataccggcgcct**G**tgGgaatatttgcagcgaaggcgtg IWGSC-5D MASK specific semi-specific





Output



000					prime	rs.csv							M
e 🗎 🕽 🖹 🚔	X 4 6	∅ 😭 • 🖂	· \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	T • fx = 10	00% -					Q+ (n	ull		⊗ 4 ▶
♠ Home Layout	Tables	Charts Sma	rtArt Formul	as Data Review									V ₽
G3 💠 😵													
A B	C D	E F	G	Н	I	J	K	L	M	N	0	Р	Q
1 Marker SNP	RegionS chromos	total_c contig_region	SNP_type	A	В	common	primer_type	orientation	A_TM	B_TM	common_TI	selected_fro	product_size
2 BS00112130 A51G	201 5A	3 IWGSC_CSS	homeologous	aagccaccgggttggaactG	aagccaccgggttggaactA	atgaaagtTGtgacccgggA	chromosome_specific	forward	62.976	61.421	59.231	second	50
3 BS00112229 A51G	201 5A	3 IWGSC_CSS	non-homeologous	ccacatccatatccttccatcG	ccacatccatatccttccatcA	ggcgtctcttatcccaaaagC	chromosome_semispecific	forward	58.396	57.354	59.329	first	56
4 BS00112558 T51G	81 5A	2 IWGSC_CSS	non-homeologous	aggccccggatccaaaatcG	aggccccggatccaaaatcT	gcggttcctctttcgttcag	chromosome_nonspecific	forward	62.625	61.289	59.209	second	50
5 BS00113122 A51G	201 5A	3 IWGSC_CSS	homeologous	caggctgatctctaattttcactC	caggctgatctctaattttcactT	cgacttgtaCAACGcatcaC	chromosome_semispecific	reverse	57.398	57.001	57.513	first	82
6 BS00114740 A51G	201 5A	1 IWGSC_CSS	non-homeologous	gaaagattatgcacattcttacacG	gaaagattatgcacattcttacacA	tgattccatcaatgaggcgaa	chromosome_nonspecific	forward	57.117	NA		first+	73
7 BS00115880 A51G	201 5A	3 IWGSC_CSS	homeologous	catatcagttcttcctgccttcG	catatcagttcttcctgccttcA	cacaatgtctgtttgctcctatT	chromosome_specific	forward	59.193	58.226		second	73
8 BS00003618 T51G	201 5A	3 IWGSC_CSS	non-homeologous	acacCcaggcCaCagTttC	acacCcaggcCaCagTttA	gagctgctgatacatacttcagT	chromosome_semispecific	reverse	60.153	58.763	58.057	first	90
9 BS00005311 A51G	201 5A	3 IWGSC_CSS	homeologous	catacctttggcttaggagtgtttC	catacctttggcttaggagtgtttT	AgtgagcaggtgccatggA	chromosome_specific	reverse	59.876	59.523		second	50
BS00009531 A51G	201 5A	3 IWGSC_CSS	non-homeologous	caAaaatgaCccgcaacaGtG	caAaaatgaCccgcaacaGtA	acctctcagggaaaggaaaAC	chromosome_specific	forward	58.874	57.365	57.489	second	105
11 BS00015653 T51G	201 5A	8 IWGSC_CSS	homeologous	ctggccctccttcatccTC	ctggccctccttcatccTA	agcttctgaggtaccactcC	chromosome_semispecific	reverse	59.164	57.753	58.437	first	83
12 BS00021725 A51G	120 5A		_5AL_scaff_2810478										
13 BS00021939 A51G	201 5A	2 IWGSC_CSS	non-homeologous	cCatgtggagactgttcacC	cCatgtggagactgttcacT	aaAgCatcaacagaGgaccC	chromosome_semispecific	reverse	58.186	57.153	57.793	first	71
14 BS00022003 T51C	101 5A			2598-2698 IWGSC_CSS_5BL	_scaff_10884282:4874-4974								
15 BS00022110 T51C	201 5A	2 IWGSC_CSS	non-homeologous	gtgctagtaacttgatgagtgcC	gtgctagtaacttgatgagtgcT	tgggacccacatccacctta	chromosome_nonspecific	forward	59.381	58.501	60.179	second	74
16 BS00022191 T51C	64 5A	1 IWGSC_CSS	_5BL_scaff_1087141	1:3696-3759									
17 BS00022500 A51G	201 5A		homeologous	cctatgcacaatGtCcagaGC	cctatgcacaatGtCcagaGT	cctgaCgtgaagcagtgC	chromosome_semispecific	reverse	59.055	57.727	58.752		65
18 BS00022815 A51G	201 5A		homeologous	aatgtacaCcacgagGCgAC	aatgtacaCcacgagGCgAT	ggtcaaacaggttcttaattcgT	chromosome_semispecific		60.389	59.465	57.315		73
19 BS00023407 A51G	201 5A		homeologous	TGAGGAAgaagaggtacctagC	TGAGGAAgaagaggtacctagT	actgcttccatggcttccT	chromosome_semispecific		58.367	57.05	58.918		90
20 BS00024602 T51G	201 5A	1 IWGSC CSS	non-homeologous	tccatcgcaggatcagtagaaG	tccatcgcaggatcagtagaaT	gtgcgtcacaatcagcaaca	chromosome nonspecific	forward	59.375	58.766	59.693	second	84
	primers.csv +												





Acknowledgments



- Mario Caccamo, Paul Bailey, Jon Wright, Sarah Ayling (TGAC)
- Cristobal Uauy, Vanesa Segovia and Nick Bird (JIC, Crop Genetics)







Thanks for your attention!



