



SNPchiMp:

A database to disentangle the (bovine) SNPchip jungle

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Some time ago..

Competere per l'eccellenza



“A job well done, always starts from having the right tools” (J. A. Nicolazzi)

Corollary: *“if you find yourself with a hammer in one hand and a screw in the other, something went terribly wrong!”*



Welcome to the (bovine) jungle

Illumina Infinium Bovine SNP50

✓ 1 chip, 1 assembly (BTAU 4.0)

- x *Many output formats (row, matrix, etc) and allele coding (forward, top, A/B)*
- x *Difficult link between Illumina SNP names and other P.A. DBs*



Affymetrix Axiom Bos1 (HD)

- ✓ New technology
- ✓ New SNPs



- x *New formats and procedures*
 - x *SNP in common?*
- x *SNP names in common?*
- x *Concept of probe!*



Illumina Infinium Bovine SNP50 (v.2)

Illumina Golden Gate Bovine3k

Illumina Infinium BovineLD

Illumina Infinium BovineHD

- ✓ Improved quality of information
 - ✓ More (less) SNPs

- x *Many output formats (row, matrix, etc) and allele coding (forward, top, A/B)*
- x *Difficult link between Illumina SNP names and other P.A. DBs*
- x *2 assemblies (BTAU 4.0 and UMD 3.1) = different positions and chromosomes*
 - x *SNPs in common?*
 - x *SNP names in common?*

Few custom SNPchips



The concept (and methods) of the SNPchiMp

Chips

SSinfo

SNPchip	Total	no rs ID	rs IDs without map information		
			BTAU4.2	UMD3.1	BTAU4.6
Bovine3k	2,900	14	17	5	20
BovineLD	6,909	3	94	14	111
BovineSNP50v.1	54,001	0	1,970	204	1,852
BovineSNP50v.2	54,609	18	2,154	340	2,031
BovineHD	777,962	13	72,014	3,338	64,528
Axiom BOS 1	648,875	288,601	130,618	0	16,207

```

oIll_SNP50_v2      INT(11)
oIll_BovineHD     INT(11)
oAffy_AxiomBos1  INT(11)

```



The SNPchiMp is born...

➤ Why not putting all this information together and easily accessible/downloadable online?

<http://bioinformatics.tecnoparco.org/SNPchimp/>

SNPchiMp

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Latest News

SNPchiMp Version 1.0.0

dbSNP builds:

136 (for BTAU4.2)

137 (for UMD3.1 and BTAU4.6)

Powerful Links

dbSNP

ENSEMBL

Parco Tecnologico Padano

Gene2farm project

Illumina

Affymetrix





Download section

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illumina_name	affymetrix_name	ILL_3k_chip	ILL_54k_v1_chip	AFFY_HD_chip
BovineHD0100000005	AX-18000040	0	0	1
BovineHD0100000037	AX-18000406	0	0	1
ARS-BFGL-NGS-16466	AX-18000987	0	1	1
ARS-BFGL-NGS-19289	AX-18001148	0	1	1
BovineHD0100000107	AX-18001429	0	0	1
BovineHD0100000128	AX-18001613	0	0	1
BTA-07251-no-rs	AX-18001779	0	1	1
BovineHD0100000146	AX-18001848	0	0	1
BovineHD0100000165	AX-18001972	0	0	1
ARS-BFGL-NGS-98142	AX-18001989	0	1	1
ARS-BFGL-NGS-29653	AX-18009026	1	1	1
BovineHD0100000198	AX-18002533	0	0	1
BovineHD0100000201	AX-18002592	0	0	1
BovineHD0100000252	AX-18003394	0	0	1
BTB-00003652	AX-18022845	1	1	1
BovineHD0100000261	AX-18003553	0	0	1
BovineHD0100000262	AX-18003561	0	0	1
ARS-BFGL-BAC-32770	AX-18003602	0	1	1
ARS-BFGL-BAC-1180		1	1	0
ARS-BFGL-BAC-14277		1	1	0
ARS-BFGL-BAC-14374		1	1	0



Browse section

Competere per l'eccellenza

Browse section

Step 1: Please select one or more assemblies:

- Native platform UMD 3.1 BTAU 4.2 BTAU 4.6

Step 2: Information required:

- rs ID Present in Chip
 Chromosome and Position Selected ss information All ss by rsID information

Step 3: Write your query:

Browse SNPs by position Syntax chromosome:start_position..stop_position

Browse SNPs by rs IDs Syntax rsId1,rsId2,...,rsIdn

Browse SNPs by ss IDs Syntax ssId1,ssId2,...,ssIdn

Browse SNPs by name Syntax SNPname1,SNPname2,...,SNPnamen



Preview (first 100 records)

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Information Display

Browse result preview 100 elements

Click on SNP name to open external Ensembl and

SNP_name	rs
BovineHD1400024323	rs134968716
BovineHD1400000008	rs133676949
ARS-BFGL-NGS-18418	rs109828062
BovineHD1400000014	rs134091939
BovineHD1400000020	rs134686904
BovineHD1400000023	rs136361067

SNPchiMp web tool Reference SNP(refSNP) Cluster Report: rs134968716

dbSNP Short Genetic Variations

Protein Genome Structure PopSet Taxonomy OMIM Books SNP

Search for SNP on NCBI Reference Assembly

for Go

Reference SNP(refSNP) Cluster Report: rs134968716

RefSNP	Allele
Organism: cow (Bos taurus)	Variation Class : SNV: single nucleotide variation
Molecule Type: Genomic	RefSNP Alleles: G/T
Created/Updated in build: 133/137	Allele Origin:
Map to Genome Build: 6.1	Ancestral Allele: Not available
Validation Status :	MAF/MinorAlleleCount: NA
	MAF Source:

SNP Details are organized in the following sections:

[GeneView](#) [Map](#) [Submission](#) [Fasta](#) [Resource](#) [Diversity](#) [Validation](#)

Export Your Data

Download CSV

[Click here for a new query](#)

Chromosome 14: 74,484-75,484

Chr. 14

Region in detail

Scroll: Track height: Drag/Select:

1.00 Mb

100.00 kb 200.00 kb 300.00 kb 400.00 kb 500.00 kb 600.00 kb 700.00 kb 800.00 kb 900.00 kb

Forward strand

Contigs Ensembl

Gene Legend

- Protein coding
- RNA gene
- Pseudogene



Benefits of the SNPchiMp

- ↗ **All information** available with a few clicks of the mouse
- ↗ Avoid SNP names **cross-reference** problems.
- ↗ **Update** chromosome and position information (in any assembly).
- ↗ Transform **allelic coding formats**.
- ↗ Across-chip / across-platform **genotype imputation & integration** of data (e.g. exchange of information).
- ↗ **Selection signatures and GWAS**: explore your results directly, link your SNPs to dbSNP and ENSEMBL
- ↗ Help in SNP data integration with **sequence data**



Version 2.0 (W.i.P.)

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- ↗ Publish Version 1.0... *still waiting for reviewers response.*
- ↗ GeneSeek Genomic Profiler (thank you **Qualitas** and **G. Evans**)
 - ↗ LD (19K SNPs) + HD (80K SNPs)
- ↗ Interbull Index (thank you **H. Jorjani**)
 - ↗ Within and across indexes for international genomic data exchange.
- ↗ New chips?
 - ↗ Custom CRV 50k
 - ↗ EuroG10k (Eurogenomics)
 - ↗ AussieLD (9k)
 - ↗ ...
- ↗ dbSNP consensus + sender sequences (*still under study*)
- ↗ Update to cow Build 138.
- ↗ Multiple species: **Pig**, Horse, **Sheep**, Goat, Buffalo, Dog, Cat, Fish(?).



Now it's your turn to meet the chiMp..

Competere per l'eccellenza

<http://bioinformatics.tecnoparco.org/SNPchimp/>



**Thank you
for your
attention**

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