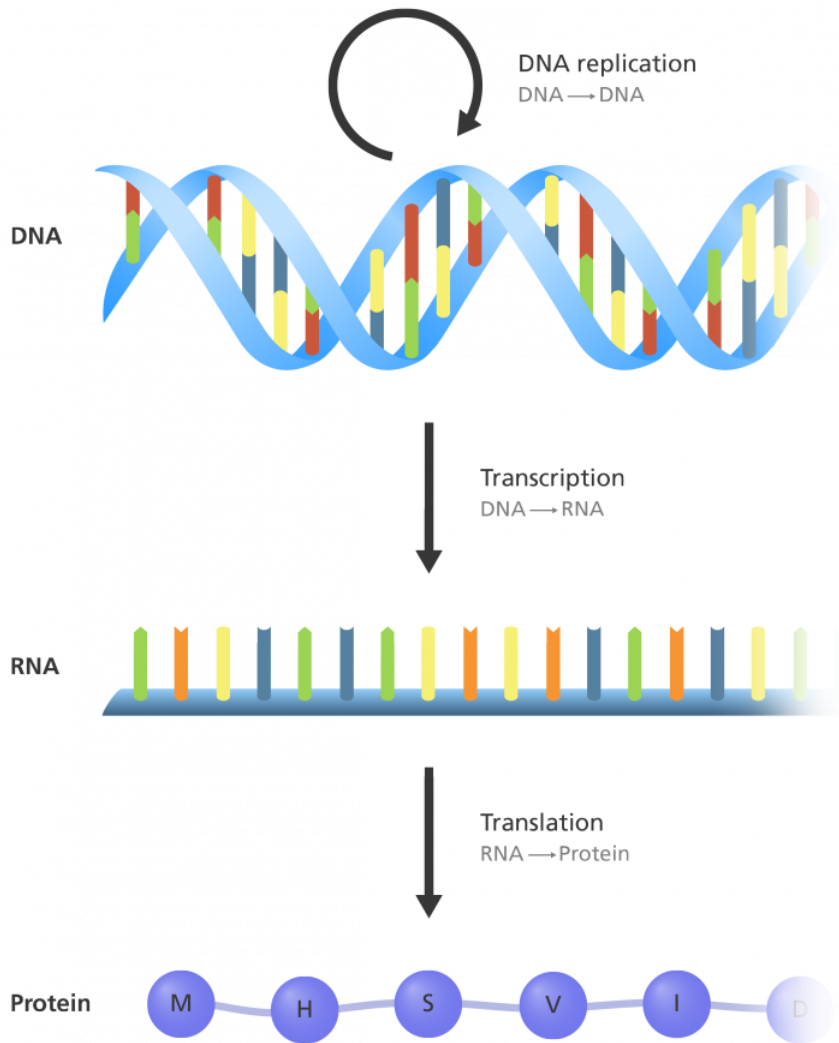


BIOLOGICAL PROCESS



**RNA Sequencing
Microarray**

Ribo-profiling

**Proteomics
peptides
quantitation
post trans mods**

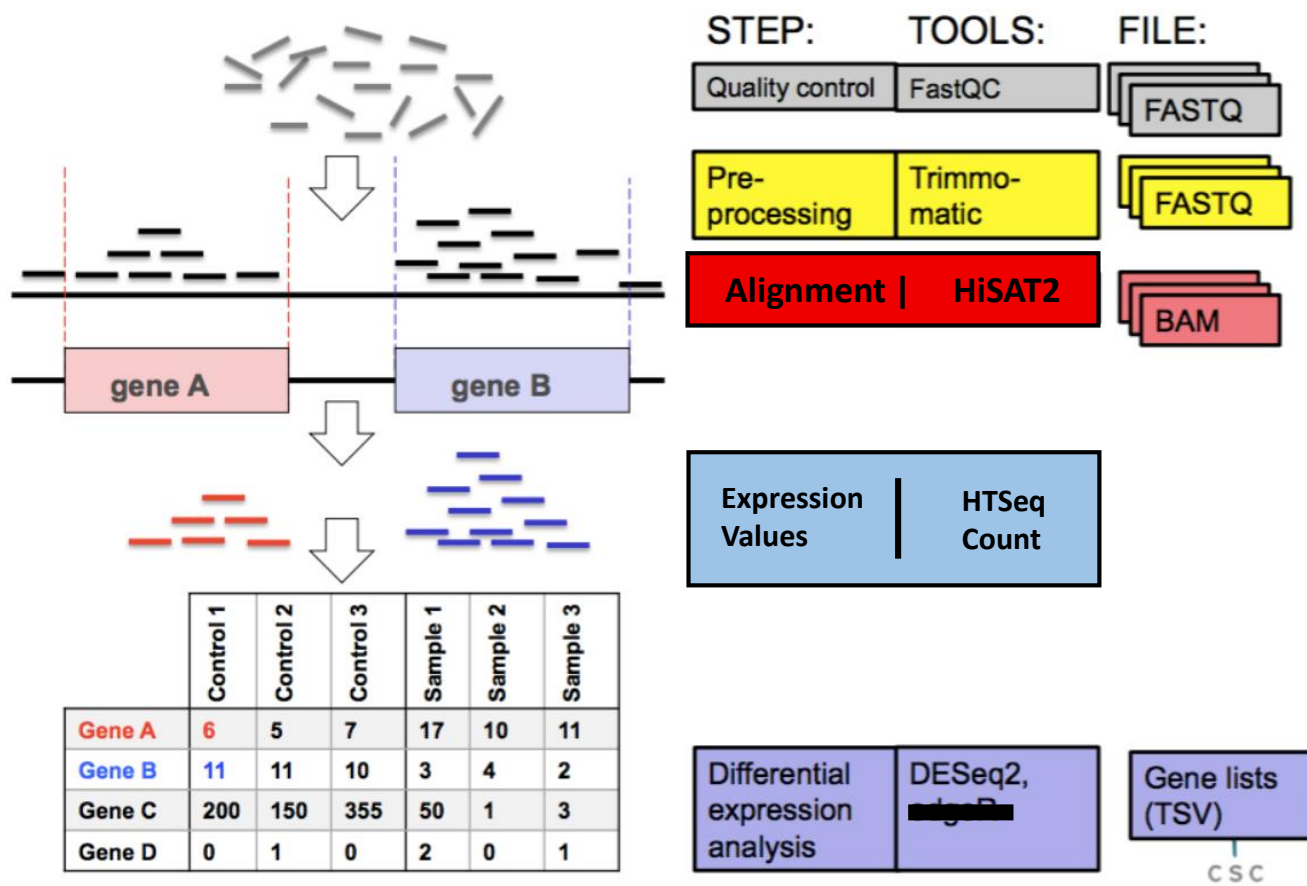
ASSAY TECHNIQUE

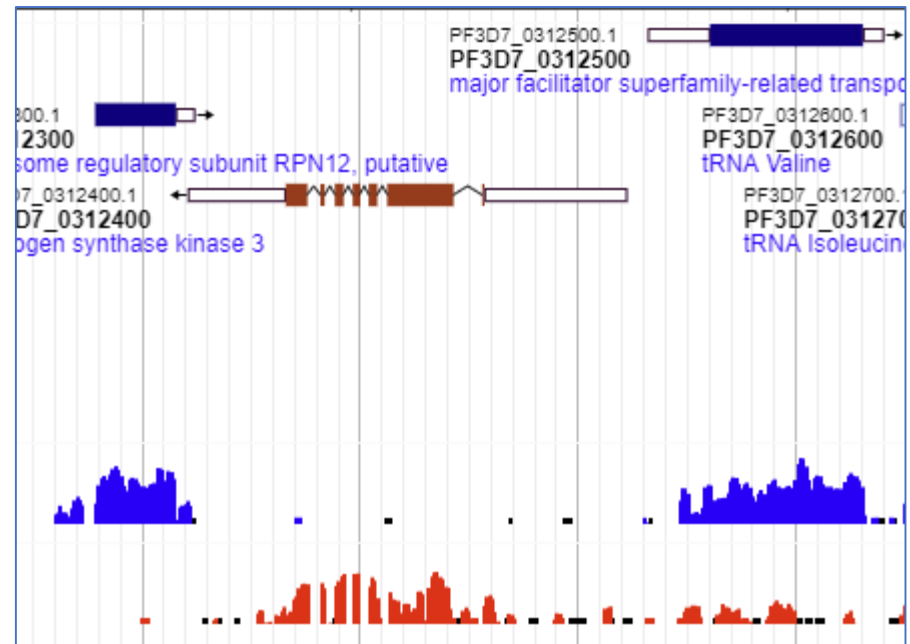
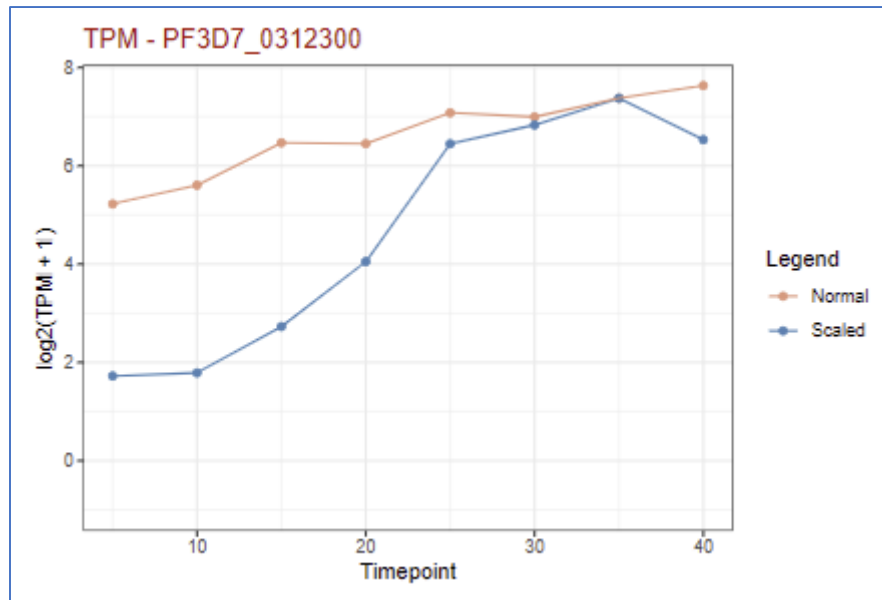
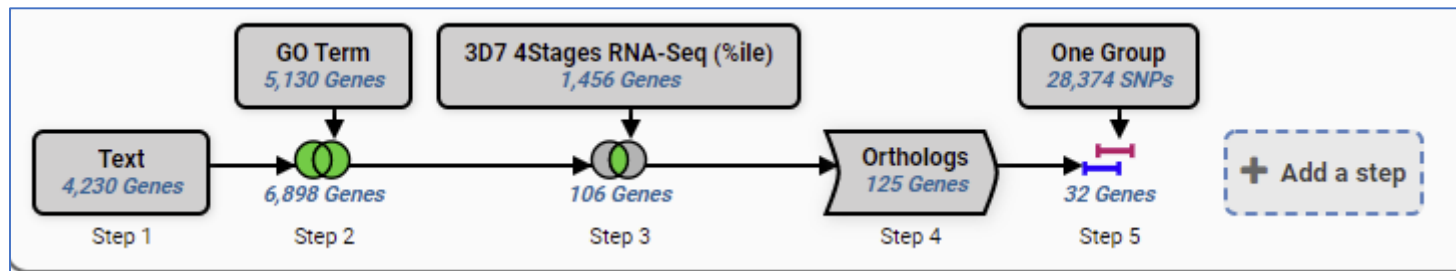
Prioritize data

- Pertinent to the field
 - Time course
 - Strain or stage comparisons
 - Knockout studies
- Publication – most
- Repository –
 - SRA – <https://www.ncbi.nlm.nih.gov/sra>
 - ENA – <https://www.ebi.ac.uk/ena>
 - DDBJ – <https://www.ddbj.nig.ac.jp/dra/index-e.html>
 - Array Express
 - ProteomeXchange
 - PRIDE

RNA sequence Analysis

- Standard workflows - compare across data sets
- determine expression levels
- TPM values





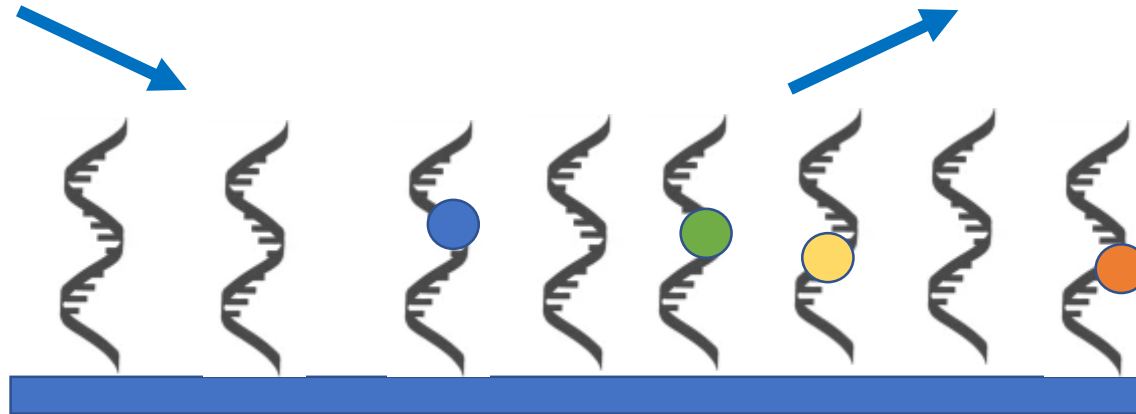
Microarray Analysis

RNA of your sample

cDNA of your sample

Fluorescence = abundance of transcript in sample

cDNA representing the whole genome



Glass Slide Microarray

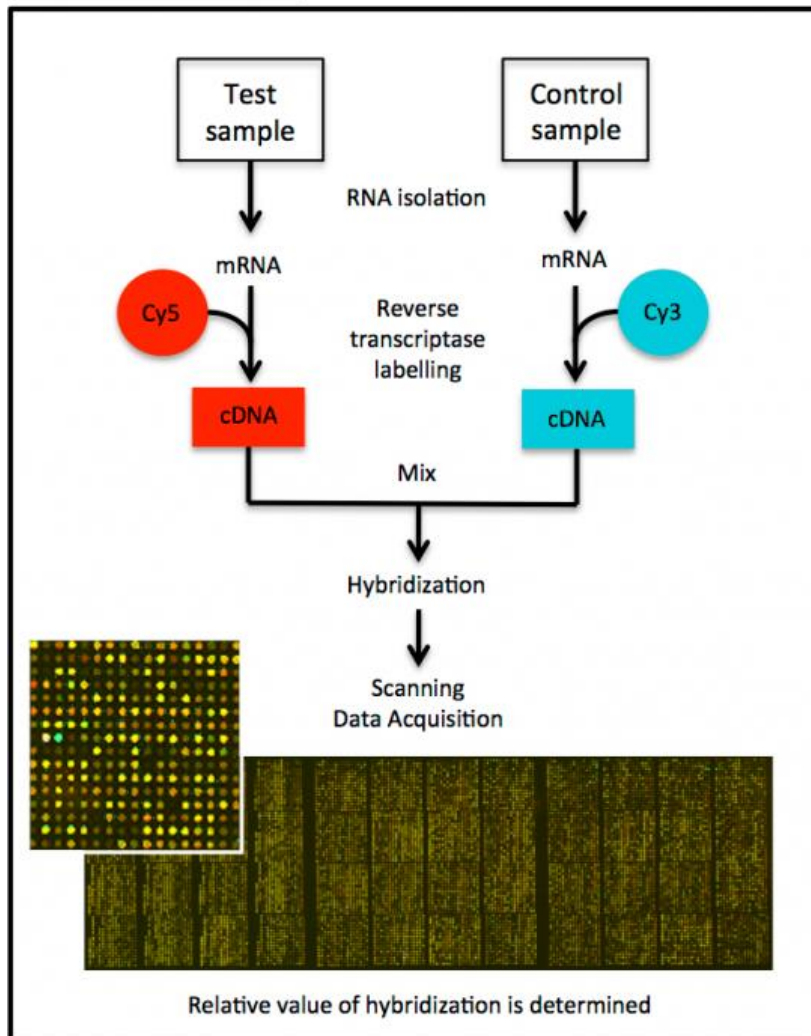
- Microarray spotting
- printing complementary DNA to monitor the expression of multiple genes on a glass slide in parallel
- Two-channel

Oligonucleotide Arrays

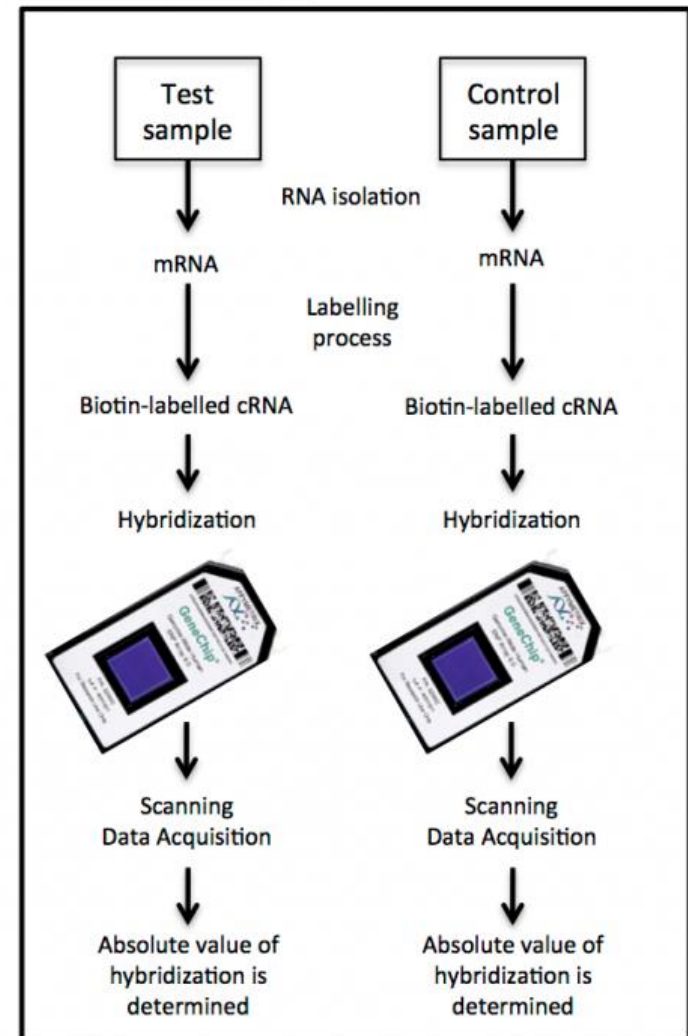
- 28 bp oligonucleotides
- Light-directed chemical synthesis printing complementary DNA
- Internal standard.
- Single channel

Microarray Analysis

Two color array



One color array



Proteomic Analysis

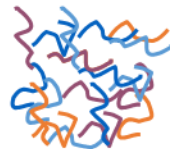
Protein of
your sample

Protein
mixture



*Chemical
treatment*
→
Digestion

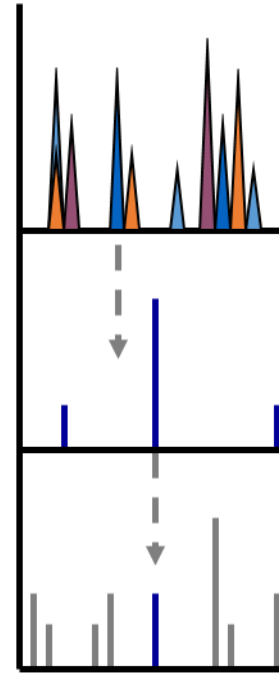
Peptide
mixture



HPLC



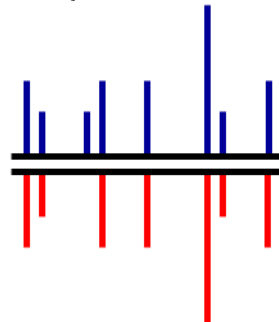
MS



Database
searching

*Correlation
analysis*

Experimental



Theoretical

MS/MS



Identification of proteins

Computational translation of MS/MS spectra to amino acid sequences using genomic or protein databases

Peptide data vs Abundance data

	A	B	C
1	PlamsoDB_ID	Sequence	PTM
2	PF3D7_0102200	LIDQGGENLEER	
3	PF3D7_0103200	SSENIQSNVSMISK	
4	PF3D7_0104200	SLNDVFDNNSYAR	
5	PF3D7_0106100	SLTDTIDVMINNITK	
6	PF3D7_0106300	VFMITGDNINTAR	
7	PF3D7_0106800	TGQNVNELFLR	
8	PF3D7_0108500	IPDLVTDENEK	
9	PF3D7_0108500	TNVEETQPVENVNNVNDVDR	
10	PF3D7_0112000	NEPYNIADIAEITYK	
11	PF3D7_0112000	SELENINAVK	
12	PF3D7_0201300	LLAQTQNK	
13	PF3D7_0201800	VITSEGMPYMENPK	Oxidation (M7); Ox
14	PF3D7_0201900	NTPSEGQQNTGLK	
15	PF3D7_0201900	NTPNEGQQNTGLK	
16	PF3D7_0201900	NTPSEGQPNTGLK	
17	PF3D7_0201900	AHENLEEYNETDLAK	
18	PF3D7_0202000	GASTTAGSTTGATTGANAVQSK	
19	PF3D7_0202000	NAANNGEQVMSR	
20	PF3D7_0202000	TGASTNAATNKGQCAAEGATK	Carbamidomethyl
21	PF3D7_0202000	DETADKNAANNGEQVMSR	
22	PF3D7_0202000	FPLGMNDEDEEGKEALAIK	
23	PF3D7_0202000	YSSFSSVNKYGK	
24	PF3D7_0202000	YSSFSSVVK	
25	PF3D7_0202400	TDTTNIADIK	
26	PF3D7_0202400	QIEHVVNNSPEK	
27	PF3D7_0202500	AVNPSISSTMYR	
28	PF3D7_0204200	ANLLANEIIEEENSK	
29	PF3D7_0204700	IYETDNVDEPLNAIK	
30	PF3D7_0204700	GGEIGTSPYITMEER	Oxidation (M12)
31	PF3D7_0206700	MDVHVHNLK	Acetyl (Protein N-1
32	PF3D7_0206800	TEFEETENDAEACSTGSEENDNLIK	

A	J	K	L	M	N
Identifier		Change in phosphorylation in absence of PfCRK4			
		29hpi log ₂ [(−)/(+)], change in phosphorylat	29hpi - log ₁₀ [(−)/(+)] p-value	37hpi log ₂ [(−)/(+)], change in phosphorylat	37hpi - log ₁₀ [(−)/(+)] p-value
ID					
PF3D7_0102600		-0.320344745	0.790982138	1.351323728	2.88839562
PF3D7_0103100		0.004948959	0.046571591	-0.15401209	1.736003493
PF3D7_0103100		0.040795187	0.122524773	0.034592008	0.35040433
PF3D7_0103200		0.229614078	0.737040028	0.06082178	0.246865584
PF3D7_0103200		0.09465902	0.186019352	0.164352773	0.846658001
PF3D7_0103200		-0.017205534	0.044153458	0.59389277	1.548406954
PF3D7_0103200		0.323136991	0.553858346	0.455729117	2.828804054
PF3D7_0103300		-0.157088792	0.10790145	0.185793372	0.419048163
PF3D7_0103300		-0.239795468	0.349152243	0.241730893	0.711397719
PF3D7_0103300		0.207869806	0.878306955	0.140415119	0.924776176
PF3D7_0104300		-0.0374053	0.035155793	0.842229018	0.856858041
PF3D7_0104300		-0.024090865	0.028281575	0.843294395	1.634374986
PF3D7_0104300		0.011326418	0.014357379	0.796520478	3.05893826
PF3D7_0104300		0.065646189	0.10058951	0.156381095	0.755815788
PF3D7_0104300		-0.166328314	0.164707224	0.775613053	0.884438928
PF3D7_0104300		-0.114697312	0.094376946	0.73834661	0.866218641
PF3D7_0104300		-0.015832798	0.022466283	0.864985405	1.702575259
PF3D7_0104300		-0.168927016	0.590523792	0.512214215	1.275498447
PF3D7_0104800		-0.020331683	0.034757874	0.571802252	2.10015185
PF3D7_0104800		-0.037509068	0.057866166	0.510948412	2.045744059
PF3D7_0104800		-0.249119918	0.546057954	0.271658518	0.318007329
PF3D7_0105200		0.224837612	0.571776891	-0.186986144	0.694571118
PF3D7_0105600		0.259898759	0.267896548	0.08986545	0.176485605
PF3D7_0105700		0.502082229	0.866012466	0.559590711	1.457526386
PF3D7_0105700		0.263745879	0.483180403	0.933951381	2.356655226
PF3D7_0105700		0.291848655	0.319600285	0.217989615	0.726022072
PF3D7_0105700		0.003936415	0.008390138	0.704165208	2.742710672
PF3D7_0105700		0.26310206	0.335595774	0.38052489	2.037791885
PF3D7_0105800		-1.002302786	1.750712884	-0.945730307	3.00163046