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Stepwise chromatin remodelling by a cascade of transcription initiation of non-coding RNAs

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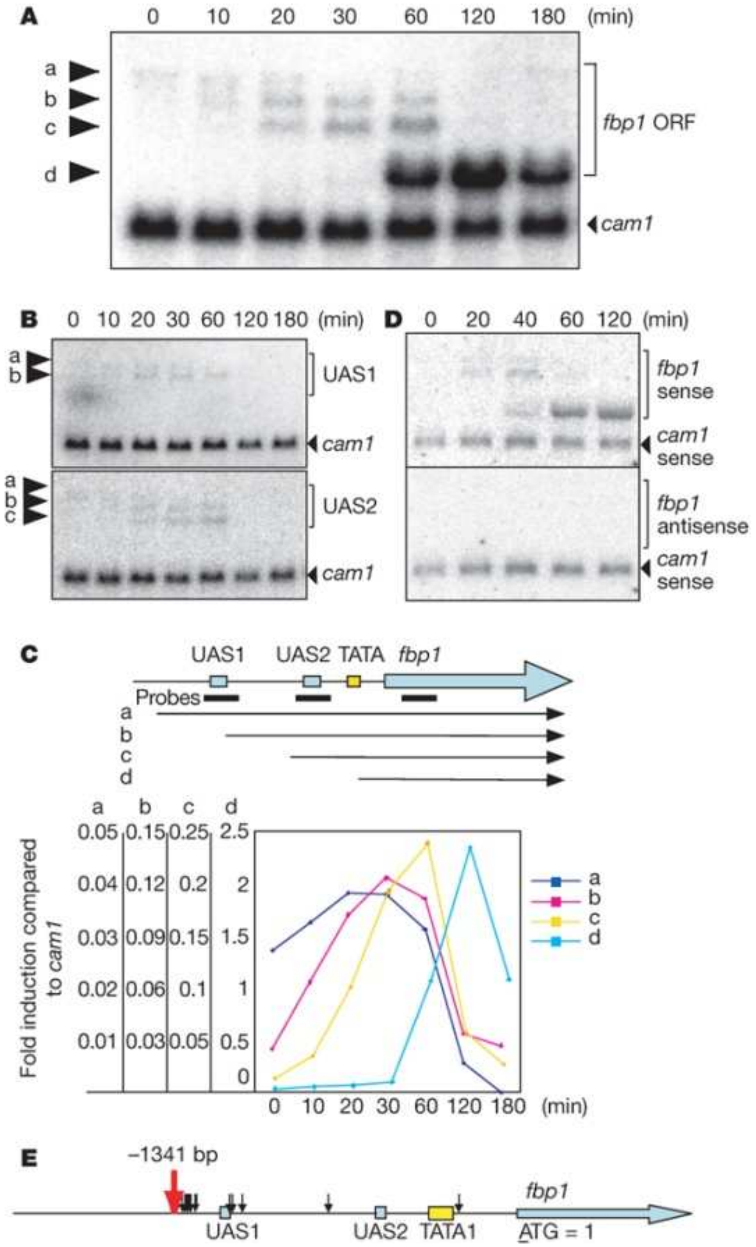
Recent transcriptome analyses using high-density tiling arrays[1, 2, 3] and data from large-scale analyses of full-length complementary DNA libraries by the FANTOM3 consortium[4, 5] demonstrate that many transcripts are non-coding RNAs (ncRNAs). These transcriptome analyses indicate that many of the non-coding regions, previously thought to be functionally inert, are actually transcriptionally active regions with various features. Furthermore, most relatively large (~several kilobases) polyadenylated messenger RNA transcripts are transcribed from regions harbouring little coding potential. However, the function of such ncRNAs is mostly unknown and has been a matter of debate[2]. Here we show that RNA polymerase II (RNAPII) transcription of ncRNAs is required for chromatin remodelling at the fission yeast *Schizosaccharomyces pombe fbp1*$^+$ locus during transcriptional activation. The chromatin at *fbp1*$^+$ is progressively converted to an open configuration, as several species of ncRNAs are transcribed through *fbp1*$^+$. This is coupled with the translocation of RNAPII through the region upstream of the eventual *fbp1*$^+$ transcriptional start site. Insertion of a transcription terminator into this upstream region abolishes both the cascade of transcription of ncRNAs and the progressive chromatin alteration. Our results demonstrate that transcription through the promoter region is required to make DNA sequences accessible to transcriptional activators and to RNAPII.

- Top

Long and rare *fbp1*$^+$ transcripts during transcriptional activation.



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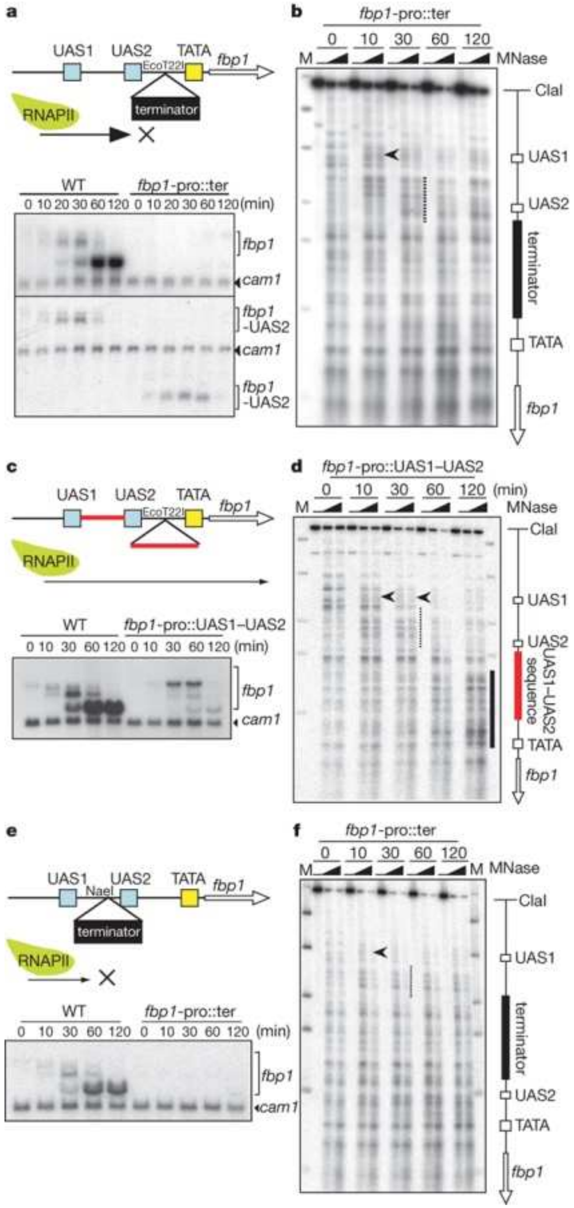
RNAPII passage along the *fbp1*⁺ promoter is required for chromatin remodelling.



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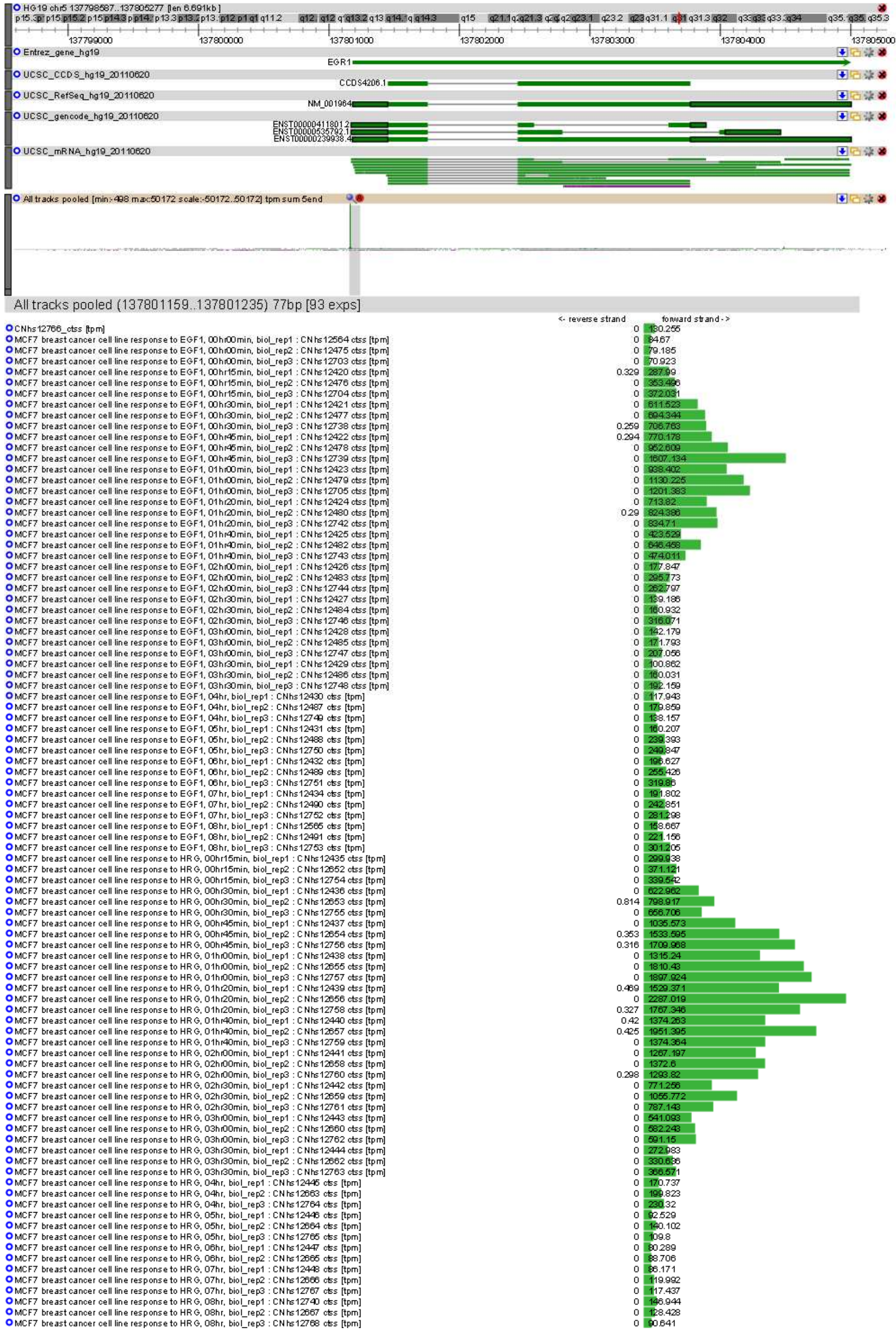
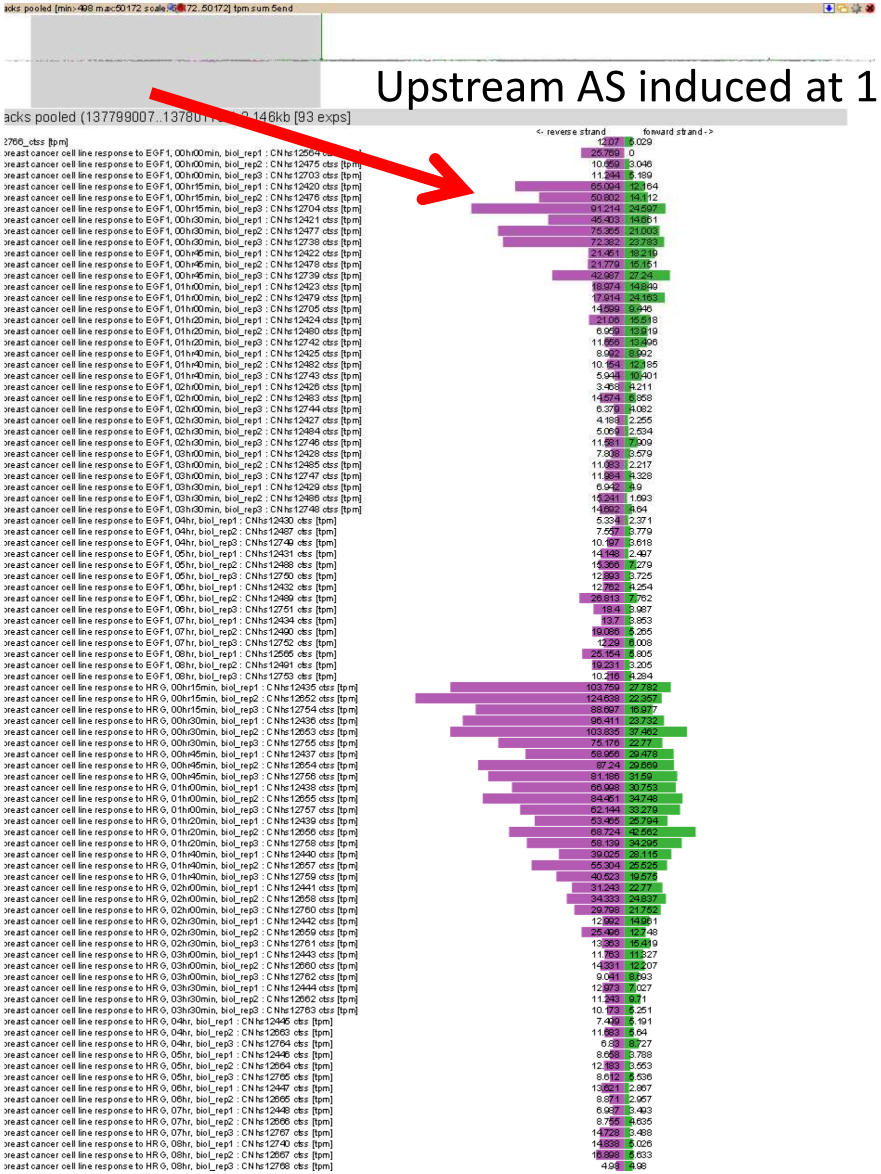
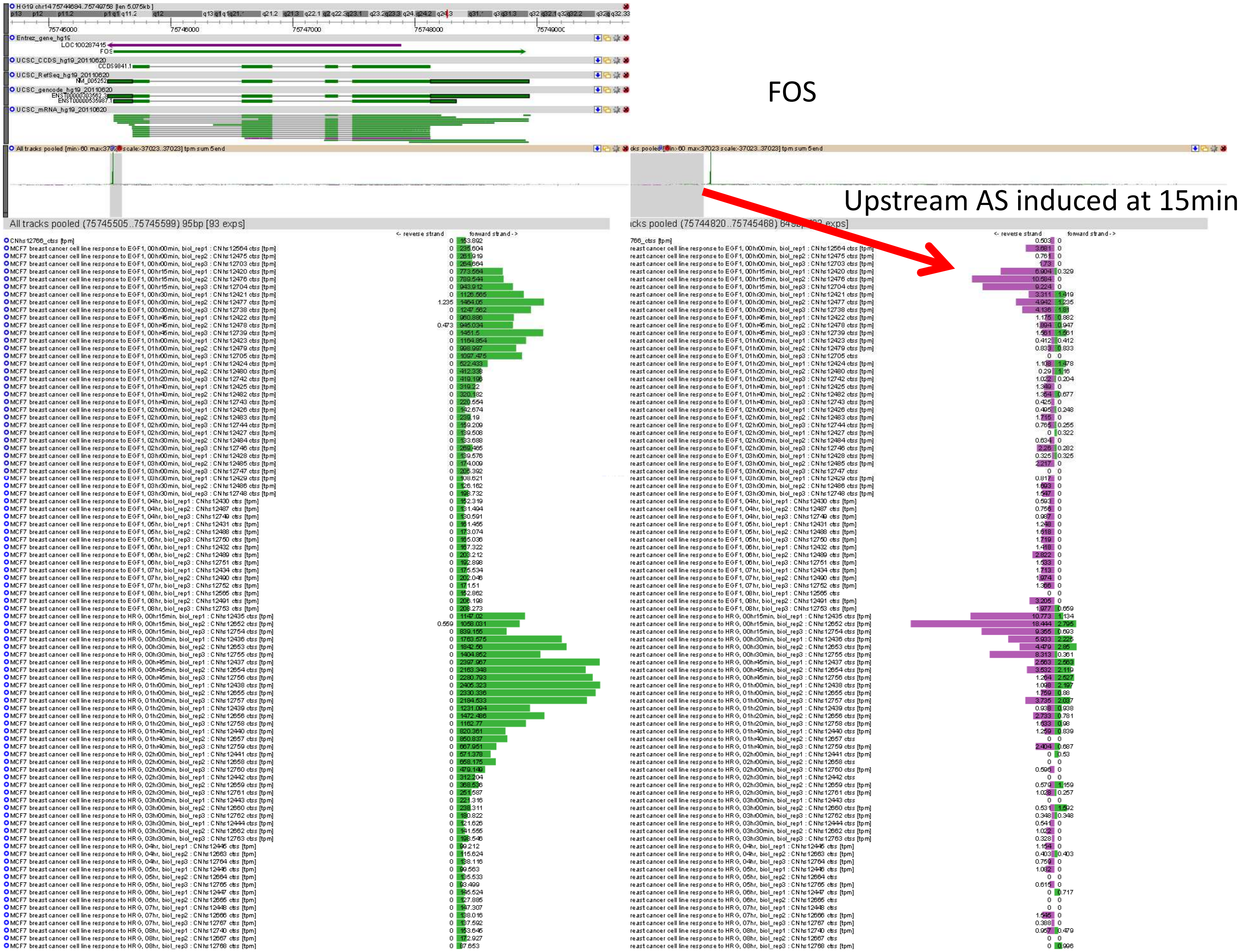
EGR1





Upstream AS induced at 15min

FOS



Upstream AS induced at 15min

All tracks pooled (75745505..75745599) 95bp [93 exps]

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CNhs12766_ctss [tpm]	0	153.892
MCF7 breast cancer cell line response to EGF1, 00hr00min, biol_rep1 : CNhs12564 ctss [tpm]	0	235.604
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MCF7 breast cancer cell line response to EGF1, 00hr00min, biol_rep3 : CNhs12703 ctss [tpm]	0	264.664
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MCF7 breast cancer cell line response to EGF1, 00hr15min, biol_rep3 : CNhs12704 ctss [tpm]	0	943.912
MCF7 breast cancer cell line response to EGF1, 00hr30min, biol_rep1 : CNhs12421 ctss [tpm]	0	1126.565
MCF7 breast cancer cell line response to EGF1, 00hr30min, biol_rep2 : CNhs12477 ctss [tpm]	1.235	1464.05
MCF7 breast cancer cell line response to EGF1, 00hr30min, biol_rep3 : CNhs12738 ctss [tpm]	0	1247.562
MCF7 breast cancer cell line response to EGF1, 00hr45min, biol_rep1 : CNhs12422 ctss [tpm]	0	960.886
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MCF7 breast cancer cell line response to EGF1, 01hr40min, biol_rep2 : CNhs12482 ctss [tpm]	0	320.182
MCF7 breast cancer cell line response to EGF1, 01hr40min, biol_rep3 : CNhs12743 ctss [tpm]	0	220.554
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MCF7 breast cancer cell line response to HRG, 08hr, biol_rep1 : CNhs12740 ctss [tpm]	0	153.645
MCF7 breast cancer cell line response to HRG, 08hr, biol_rep2 : CNhs12667 ctss [tpm]	0	172.927
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cks pooled (75744820..75745468) 64[illegible] exps]

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reast cancer cell line response to EGF1, 08hr, biol_rep2 : CNhs12491 ctss [tpm]	3.205	0
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reast cancer cell line response to HRG, 00hr45min, biol_rep2 : CNhs12654 ctss [tpm]	3.532	2.119
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reast cancer cell line response to HRG, 01hr20min, biol_rep3 : CNhs12758 ctss [tpm]	1.633	0.98
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reast cancer cell line response to HRG, 01hr40min, biol_rep2 : CNhs12657 ctss	0	0
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reast cancer cell line response to HRG, 02hr00min, biol_rep2 : CNhs12658 ctss	0	0
reast cancer cell line response to HRG, 02hr00min, biol_rep3 : CNhs12760 ctss [tpm]	0.596	0
reast cancer cell line response to HRG, 02hr30min, biol_rep1 : CNhs12442 ctss	0	0
reast cancer cell line response to HRG, 02hr30min, biol_rep2 : CNhs12659 ctss [tpm]	0.579	1.159
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reast cancer cell line response to HRG, 03hr00min, biol_rep2 : CNhs12660 ctss [tpm]	0.531	1.592
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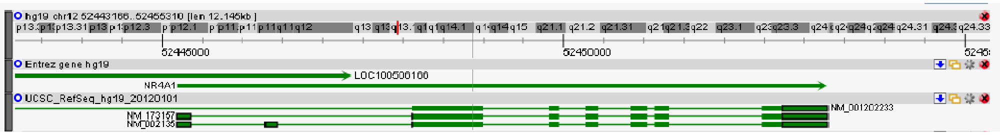
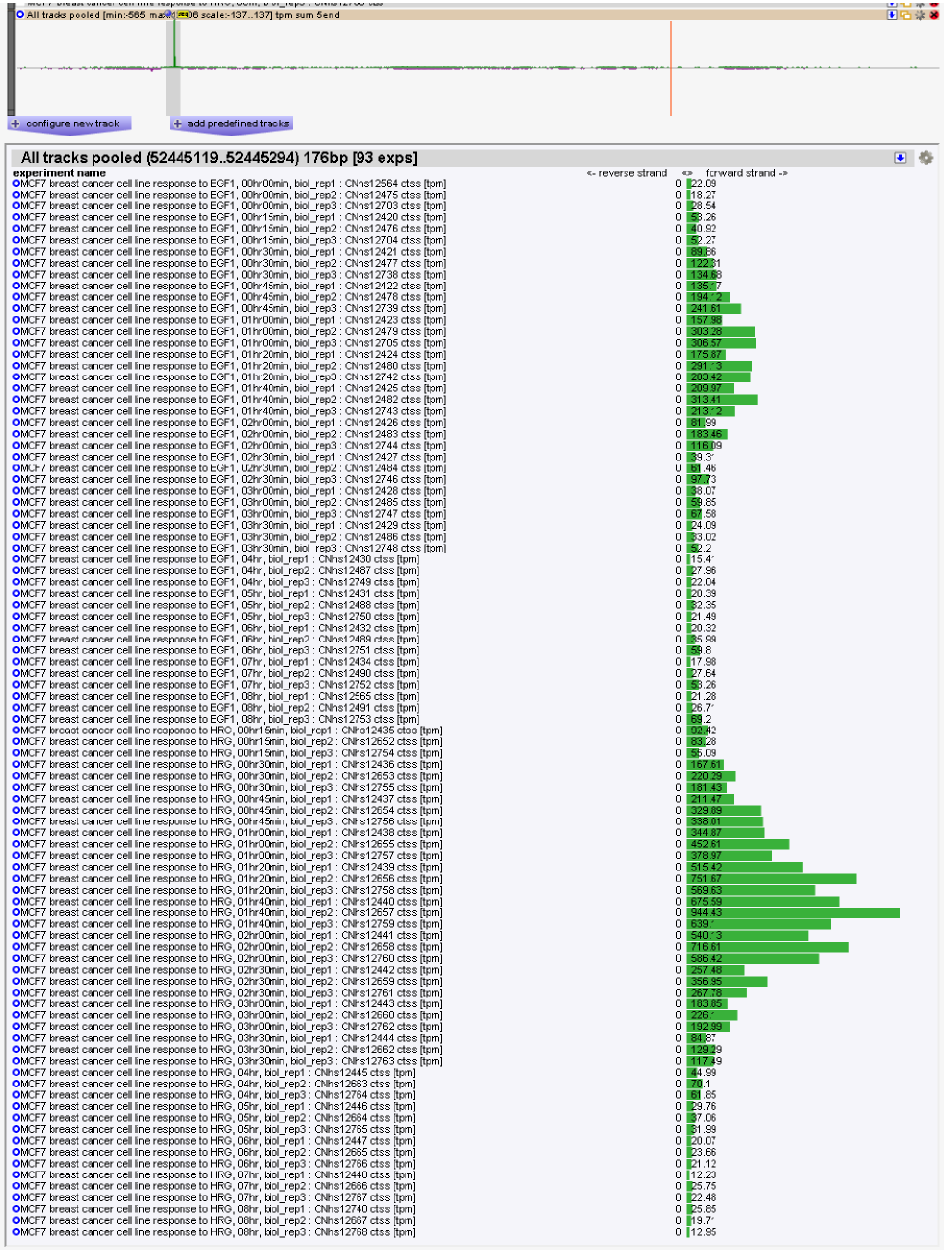
reast cancer cell line response to HRG, 03hr30min, biol_rep1 : CNhs12444 ctss [tpm]	0.541	0
reast cancer cell line response to HRG, 03hr30min, biol_rep2 : CNhs12662 ctss [tpm]	1.022	0
reast cancer cell line response to HRG, 03hr30min, biol_rep3 : CNhs12763 ctss [tpm]	0.328	0
reast cancer cell line response to HRG, 04hr, biol_rep1 : CNhs12445 ctss [tpm]	1.154	0
reast cancer cell line response to HRG, 04hr, biol_rep2 : CNhs12663 ctss [tpm]	0.403	0.403
reast cancer cell line response to HRG, 04hr, biol_rep3 : CNhs12764 ctss [tpm]	0.759	0
reast cancer cell line response to HRG, 05hr, biol_rep1 : CNhs12446 ctss [tpm]	1.082	0
reast cancer cell line response to HRG, 05hr, biol_rep2 : CNhs12664 ctss	0	0
reast cancer cell line response to HRG, 05hr, biol_rep3 : CNhs12765 ctss [tpm]	0.615	0
reast cancer cell line response to HRG, 06hr, biol_rep1 : CNhs12447 ctss [tpm]	0	0.717
reast cancer cell line response to HRG, 06hr, biol_rep2 : CNhs12665 ctss	0	0
reast cancer cell line response to HRG, 07hr, biol_rep1 : CNhs12448 ctss	0	0
reast cancer cell line response to HRG, 07hr, biol_rep2 : CNhs12666 ctss [tpm]	1.545	0
reast cancer cell line response to HRG, 07hr, biol_rep3 : CNhs12767 ctss [tpm]	0.388	0
reast cancer cell line response to HRG, 08hr, biol_rep1 : CNhs12740 ctss [tpm]	0.957	0.479
reast cancer cell line response to HRG, 08hr, biol_rep2 : CNhs12667 ctss	0	0
reast cancer cell line response to HRG, 08hr, biol_rep3 : CNhs12768 ctss [tpm]	0	0.996

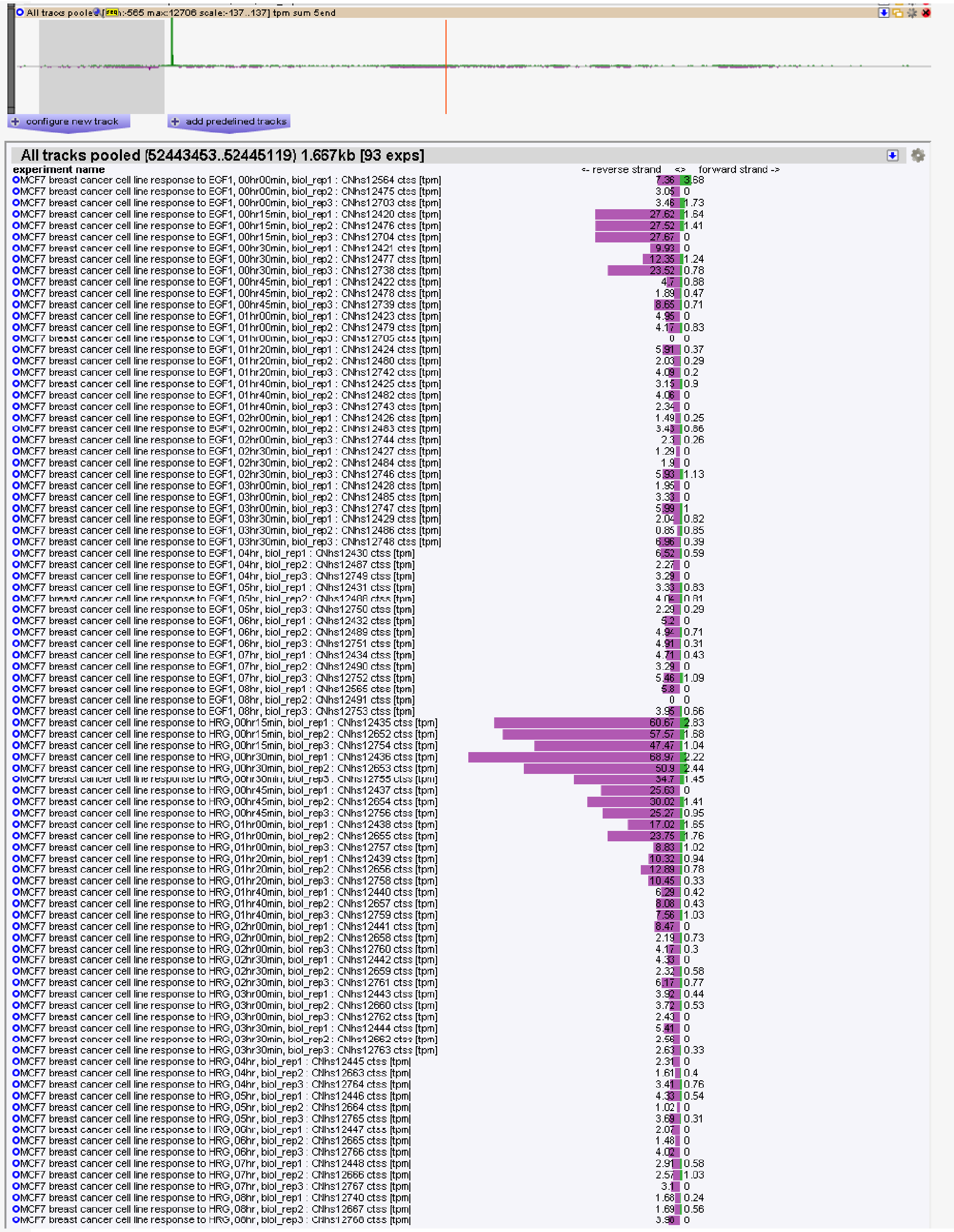
NR4A1





All tracks pooled (52445119..52445294) 176bp [93 exps]

experiment name	<- reverse strand	forward strand ->
MCF7 breast cancer cell line response to EGF1, 00hr00min, biol_rep1 : CNhs12564 ctss [tpm]	0	22.09
MCF7 breast cancer cell line response to EGF1, 00hr00min, biol_rep2 : CNhs12475 ctss [tpm]	0	18.27
MCF7 breast cancer cell line response to EGF1, 00hr00min, biol_rep3 : CNhs12703 ctss [tpm]	0	28.54
MCF7 breast cancer cell line response to EGF1, 00hr15min, biol_rep1 : CNhs12420 ctss [tpm]	0	53.26
MCF7 breast cancer cell line response to EGF1, 00hr15min, biol_rep2 : CNhs12476 ctss [tpm]	0	40.92
MCF7 breast cancer cell line response to EGF1, 00hr15min, biol_rep3 : CNhs12704 ctss [tpm]	0	52.27
MCF7 breast cancer cell line response to EGF1, 00hr30min, biol_rep1 : CNhs12421 ctss [tpm]	0	89.86
MCF7 breast cancer cell line response to EGF1, 00hr30min, biol_rep2 : CNhs12477 ctss [tpm]	0	122.31
MCF7 breast cancer cell line response to EGF1, 00hr30min, biol_rep3 : CNhs12738 ctss [tpm]	0	134.68
MCF7 breast cancer cell line response to EGF1, 00hr45min, biol_rep1 : CNhs12422 ctss [tpm]	0	135.17
MCF7 breast cancer cell line response to EGF1, 00hr45min, biol_rep2 : CNhs12478 ctss [tpm]	0	194.12
MCF7 breast cancer cell line response to EGF1, 00hr45min, biol_rep3 : CNhs12739 ctss [tpm]	0	241.61
MCF7 breast cancer cell line response to EGF1, 01hr00min, biol_rep1 : CNhs12423 ctss [tpm]	0	157.98
MCF7 breast cancer cell line response to EGF1, 01hr00min, biol_rep2 : CNhs12479 ctss [tpm]	0	303.28
MCF7 breast cancer cell line response to EGF1, 01hr00min, biol_rep3 : CNhs12705 ctss [tpm]	0	306.57
MCF7 breast cancer cell line response to EGF1, 01hr20min, biol_rep1 : CNhs12424 ctss [tpm]	0	175.87
MCF7 breast cancer cell line response to EGF1, 01hr20min, biol_rep2 : CNhs12480 ctss [tpm]	0	291.13
MCF7 breast cancer cell line response to EGF1, 01hr20min, biol_rep3 : CNhs12742 ctss [tpm]	0	203.42
MCF7 breast cancer cell line response to EGF1, 01hr40min, biol_rep1 : CNhs12425 ctss [tpm]	0	209.97
MCF7 breast cancer cell line response to EGF1, 01hr40min, biol_rep2 : CNhs12482 ctss [tpm]	0	313.41
MCF7 breast cancer cell line response to EGF1, 01hr40min, biol_rep3 : CNhs12743 ctss [tpm]	0	213.12
MCF7 breast cancer cell line response to EGF1, 02hr00min, biol_rep1 : CNhs12426 ctss [tpm]	0	81.99
MCF7 breast cancer cell line response to EGF1, 02hr00min, biol_rep2 : CNhs12483 ctss [tpm]	0	183.46
MCF7 breast cancer cell line response to EGF1, 02hr00min, biol_rep3 : CNhs12744 ctss [tpm]	0	116.09
MCF7 breast cancer cell line response to EGF1, 02hr30min, biol_rep1 : CNhs12427 ctss [tpm]	0	39.31
MCF7 breast cancer cell line response to EGF1, 02hr30min, biol_rep2 : CNhs12484 ctss [tpm]	0	61.46
MCF7 breast cancer cell line response to EGF1, 02hr30min, biol_rep3 : CNhs12746 ctss [tpm]	0	97.73
MCF7 breast cancer cell line response to EGF1, 03hr00min, biol_rep1 : CNhs12428 ctss [tpm]	0	38.07
MCF7 breast cancer cell line response to EGF1, 03hr00min, biol_rep2 : CNhs12485 ctss [tpm]	0	59.85
MCF7 breast cancer cell line response to EGF1, 03hr00min, biol_rep3 : CNhs12747 ctss [tpm]	0	67.58
MCF7 breast cancer cell line response to EGF1, 03hr30min, biol_rep1 : CNhs12429 ctss [tpm]	0	24.09
MCF7 breast cancer cell line response to EGF1, 03hr30min, biol_rep2 : CNhs12486 ctss [tpm]	0	33.02
MCF7 breast cancer cell line response to EGF1, 03hr30min, biol_rep3 : CNhs12748 ctss [tpm]	0	52.2
MCF7 breast cancer cell line response to EGF1, 04hr, biol_rep1 : CNhs12430 ctss [tpm]	0	15.41
MCF7 breast cancer cell line response to EGF1, 04hr, biol_rep2 : CNhs12487 ctss [tpm]	0	27.96
MCF7 breast cancer cell line response to EGF1, 04hr, biol_rep3 : CNhs12749 ctss [tpm]	0	22.04
MCF7 breast cancer cell line response to EGF1, 05hr, biol_rep1 : CNhs12431 ctss [tpm]	0	20.39
MCF7 breast cancer cell line response to EGF1, 05hr, biol_rep2 : CNhs12488 ctss [tpm]	0	32.35
MCF7 breast cancer cell line response to EGF1, 05hr, biol_rep3 : CNhs12750 ctss [tpm]	0	21.49
MCF7 breast cancer cell line response to EGF1, 06hr, biol_rep1 : CNhs12432 ctss [tpm]	0	20.32
MCF7 breast cancer cell line response to EGF1, 06hr, biol_rep2 : CNhs12489 ctss [tpm]	0	35.99
MCF7 breast cancer cell line response to EGF1, 06hr, biol_rep3 : CNhs12751 ctss [tpm]	0	59.8
MCF7 breast cancer cell line response to EGF1, 07hr, biol_rep1 : CNhs12434 ctss [tpm]	0	17.98
MCF7 breast cancer cell line response to EGF1, 07hr, biol_rep2 : CNhs12490 ctss [tpm]	0	27.64
MCF7 breast cancer cell line response to EGF1, 07hr, biol_rep3 : CNhs12752 ctss [tpm]	0	53.26
MCF7 breast cancer cell line response to EGF1, 08hr, biol_rep1 : CNhs12565 ctss [tpm]	0	21.28
MCF7 breast cancer cell line response to EGF1, 08hr, biol_rep2 : CNhs12491 ctss [tpm]	0	26.71
MCF7 breast cancer cell line response to EGF1, 08hr, biol_rep3 : CNhs12753 ctss [tpm]	0	69.2
MCF7 breast cancer cell line response to HRG, 00hr15min, biol_rep1 : CNhs12435 ctss [tpm]	0	92.42
MCF7 breast cancer cell line response to HRG, 00hr15min, biol_rep2 : CNhs12652 ctss [tpm]	0	83.28
MCF7 breast cancer cell line response to HRG, 00hr15min, biol_rep3 : CNhs12754 ctss [tpm]	0	55.09
MCF7 breast cancer cell line response to HRG, 00hr30min, biol_rep1 : CNhs12436 ctss [tpm]	0	167.61
MCF7 breast cancer cell line response to HRG, 00hr30min, biol_rep2 : CNhs12653 ctss [tpm]	0	220.29
MCF7 breast cancer cell line response to HRG, 00hr30min, biol_rep3 : CNhs12755 ctss [tpm]	0	181.43
MCF7 breast cancer cell line response to HRG, 00hr45min, biol_rep1 : CNhs12437 ctss [tpm]	0	211.47
MCF7 breast cancer cell line response to HRG, 00hr45min, biol_rep2 : CNhs12654 ctss [tpm]	0	329.89
MCF7 breast cancer cell line response to HRG, 00hr45min, biol_rep3 : CNhs12756 ctss [tpm]	0	338.01
MCF7 breast cancer cell line response to HRG, 01hr00min, biol_rep1 : CNhs12438 ctss [tpm]	0	344.87
MCF7 breast cancer cell line response to HRG, 01hr00min, biol_rep2 : CNhs12655 ctss [tpm]	0	452.61
MCF7 breast cancer cell line response to HRG, 01hr00min, biol_rep3 : CNhs12757 ctss [tpm]	0	378.97
MCF7 breast cancer cell line response to HRG, 01hr20min, biol_rep1 : CNhs12439 ctss [tpm]	0	515.42
MCF7 breast cancer cell line response to HRG, 01hr20min, biol_rep2 : CNhs12656 ctss [tpm]	0	751.67
MCF7 breast cancer cell line response to HRG, 01hr20min, biol_rep3 : CNhs12758 ctss [tpm]	0	569.63
MCF7 breast cancer cell line response to HRG, 01hr40min, biol_rep1 : CNhs12440 ctss [tpm]	0	675.59
MCF7 breast cancer cell line response to HRG, 01hr40min, biol_rep2 : CNhs12657 ctss [tpm]	0	944.43
MCF7 breast cancer cell line response to HRG, 01hr40min, biol_rep3 : CNhs12759 ctss [tpm]	0	639.1
MCF7 breast cancer cell line response to HRG, 02hr00min, biol_rep1 : CNhs12441 ctss [tpm]	0	540.13
MCF7 breast cancer cell line response to HRG, 02hr00min, biol_rep2 : CNhs12658 ctss [tpm]	0	716.61
MCF7 breast cancer cell line response to HRG, 02hr00min, biol_rep3 : CNhs12760 ctss [tpm]	0	586.42
MCF7 breast cancer cell line response to HRG, 02hr30min, biol_rep1 : CNhs12442 ctss [tpm]	0	257.48
MCF7 breast cancer cell line response to HRG, 02hr30min, biol_rep2 : CNhs12659 ctss [tpm]	0	356.95
MCF7 breast cancer cell line response to HRG, 02hr30min, biol_rep3 : CNhs12761 ctss [tpm]	0	267.78
MCF7 breast cancer cell line response to HRG, 03hr00min, biol_rep1 : CNhs12443 ctss [tpm]	0	183.85
MCF7 breast cancer cell line response to HRG, 03hr00min, biol_rep2 : CNhs12660 ctss [tpm]	0	226.1
MCF7 breast cancer cell line response to HRG, 03hr00min, biol_rep3 : CNhs12762 ctss [tpm]	0	192.99
MCF7 breast cancer cell line response to HRG, 03hr30min, biol_rep1 : CNhs12444 ctss [tpm]	0	84.87
MCF7 breast cancer cell line response to HRG, 03hr30min, biol_rep2 : CNhs12662 ctss [tpm]	0	129.29
MCF7 breast cancer cell line response to HRG, 03hr30min, biol_rep3 : CNhs12763 ctss [tpm]	0	117.49
MCF7 breast cancer cell line response to HRG, 04hr, biol_rep1 : CNhs12445 ctss [tpm]	0	44.99
MCF7 breast cancer cell line response to HRG, 04hr, biol_rep2 : CNhs12663 ctss [tpm]	0	70.1
MCF7 breast cancer cell line response to HRG, 04hr, biol_rep3 : CNhs12764 ctss [tpm]	0	61.85
MCF7 breast cancer cell line response to HRG, 05hr, biol_rep1 : CNhs12446 ctss [tpm]	0	29.76
MCF7 breast cancer cell line response to HRG, 05hr, biol_rep2 : CNhs12664 ctss [tpm]	0	37.06
MCF7 breast cancer cell line response to HRG, 05hr, biol_rep3 : CNhs12765 ctss [tpm]	0	31.99
MCF7 breast cancer cell line response to HRG, 06hr, biol_rep1 : CNhs12447 ctss [tpm]	0	20.07
MCF7 breast cancer cell line response to HRG, 06hr, biol_rep2 : CNhs12665 ctss [tpm]	0	23.66
MCF7 breast cancer cell line response to HRG, 06hr, biol_rep3 : CNhs12766 ctss [tpm]	0	21.12
MCF7 breast cancer cell line response to HRG, 07hr, biol_rep1 : CNhs12448 ctss [tpm]	0	12.23
MCF7 breast cancer cell line response to HRG, 07hr, biol_rep2 : CNhs12666 ctss [tpm]	0	25.75
MCF7 breast cancer cell line response to HRG, 07hr, biol_rep3 : CNhs12767 ctss [tpm]	0	22.48
MCF7 breast cancer cell line response to HRG, 08hr, biol_rep1 : CNhs12740 ctss [tpm]	0	25.85
MCF7 breast cancer cell line response to HRG, 08hr, biol_rep2 : CNhs12667 ctss [tpm]	0	19.71
MCF7 breast cancer cell line response to HRG, 08hr, biol_rep3 : CNhs12768 ctss [tpm]	0	12.95



All tracks pooled (52443453..52445119) 1.667kb [93 exps]

experiment name	<- reverse strand	forward strand ->
MCF7 breast cancer cell line response to EGF1, 00hr00min, biol_rep1 : CNhs12564 ctss [tpm]	7.36	3.68
MCF7 breast cancer cell line response to EGF1, 00hr00min, biol_rep2 : CNhs12475 ctss [tpm]	3.05	0
MCF7 breast cancer cell line response to EGF1, 00hr00min, biol_rep3 : CNhs12703 ctss [tpm]	3.46	1.73
MCF7 breast cancer cell line response to EGF1, 00hr15min, biol_rep1 : CNhs12420 ctss [tpm]	27.62	1.64
MCF7 breast cancer cell line response to EGF1, 00hr15min, biol_rep2 : CNhs12476 ctss [tpm]	27.52	1.41
MCF7 breast cancer cell line response to EGF1, 00hr15min, biol_rep3 : CNhs12704 ctss [tpm]	27.67	0
MCF7 breast cancer cell line response to EGF1, 00hr30min, biol_rep1 : CNhs12421 ctss [tpm]	9.93	0
MCF7 breast cancer cell line response to EGF1, 00hr30min, biol_rep2 : CNhs12477 ctss [tpm]	12.35	1.24
MCF7 breast cancer cell line response to EGF1, 00hr30min, biol_rep3 : CNhs12738 ctss [tpm]	23.52	0.78
MCF7 breast cancer cell line response to EGF1, 00hr45min, biol_rep1 : CNhs12422 ctss [tpm]	4.7	0.88
MCF7 breast cancer cell line response to EGF1, 00hr45min, biol_rep2 : CNhs12478 ctss [tpm]	1.89	0.47
MCF7 breast cancer cell line response to EGF1, 00hr45min, biol_rep3 : CNhs12739 ctss [tpm]	8.65	0.71
MCF7 breast cancer cell line response to EGF1, 01hr00min, biol_rep1 : CNhs12423 ctss [tpm]	4.95	0
MCF7 breast cancer cell line response to EGF1, 01hr00min, biol_rep2 : CNhs12479 ctss [tpm]	4.17	0.83
MCF7 breast cancer cell line response to EGF1, 01hr00min, biol_rep3 : CNhs12705 ctss [tpm]	0	0
MCF7 breast cancer cell line response to EGF1, 01hr20min, biol_rep1 : CNhs12424 ctss [tpm]	5.91	0.37
MCF7 breast cancer cell line response to EGF1, 01hr20min, biol_rep2 : CNhs12480 ctss [tpm]	2.03	0.29
MCF7 breast cancer cell line response to EGF1, 01hr20min, biol_rep3 : CNhs12742 ctss [tpm]	4.09	0.2
MCF7 breast cancer cell line response to EGF1, 01hr40min, biol_rep1 : CNhs12425 ctss [tpm]	3.15	0.9
MCF7 breast cancer cell line response to EGF1, 01hr40min, biol_rep2 : CNhs12482 ctss [tpm]	4.06	0
MCF7 breast cancer cell line response to EGF1, 01hr40min, biol_rep3 : CNhs12743 ctss [tpm]	2.34	0
MCF7 breast cancer cell line response to EGF1, 02hr00min, biol_rep1 : CNhs12426 ctss [tpm]	1.49	0.25
MCF7 breast cancer cell line response to EGF1, 02hr00min, biol_rep2 : CNhs12483 ctss [tpm]	3.43	0.86
MCF7 breast cancer cell line response to EGF1, 02hr00min, biol_rep3 : CNhs12744 ctss [tpm]	2.3	0.26
MCF7 breast cancer cell line response to EGF1, 02hr30min, biol_rep1 : CNhs12427 ctss [tpm]	1.29	0
MCF7 breast cancer cell line response to EGF1, 02hr30min, biol_rep2 : CNhs12484 ctss [tpm]	1.9	0
MCF7 breast cancer cell line response to EGF1, 02hr30min, biol_rep3 : CNhs12746 ctss [tpm]	5.93	1.13
MCF7 breast cancer cell line response to EGF1, 03hr00min, biol_rep1 : CNhs12428 ctss [tpm]	1.95	0
MCF7 breast cancer cell line response to EGF1, 03hr00min, biol_rep2 : CNhs12485 ctss [tpm]	3.33	0
MCF7 breast cancer cell line response to EGF1, 03hr00min, biol_rep3 : CNhs12747 ctss [tpm]	5.99	1
MCF7 breast cancer cell line response to EGF1, 03hr30min, biol_rep1 : CNhs12429 ctss [tpm]	2.04	0.82
MCF7 breast cancer cell line response to EGF1, 03hr30min, biol_rep2 : CNhs12486 ctss [tpm]	0.85	0.85
MCF7 breast cancer cell line response to EGF1, 03hr30min, biol_rep3 : CNhs12748 ctss [tpm]	6.96	0.39
MCF7 breast cancer cell line response to EGF1, 04hr, biol_rep1 : CNhs12430 ctss [tpm]	6.52	0.59
MCF7 breast cancer cell line response to EGF1, 04hr, biol_rep2 : CNhs12487 ctss [tpm]	2.27	0
MCF7 breast cancer cell line response to EGF1, 04hr, biol_rep3 : CNhs12749 ctss [tpm]	3.29	0
MCF7 breast cancer cell line response to EGF1, 05hr, biol_rep1 : CNhs12431 ctss [tpm]	3.33	0.83
MCF7 breast cancer cell line response to EGF1, 05hr, biol_rep2 : CNhs12488 ctss [tpm]	4.04	0.81
MCF7 breast cancer cell line response to EGF1, 05hr, biol_rep3 : CNhs12750 ctss [tpm]	2.29	0.29
MCF7 breast cancer cell line response to EGF1, 06hr, biol_rep1 : CNhs12432 ctss [tpm]	5.2	0
MCF7 breast cancer cell line response to EGF1, 06hr, biol_rep2 : CNhs12489 ctss [tpm]	4.94	0.71
MCF7 breast cancer cell line response to EGF1, 06hr, biol_rep3 : CNhs12751 ctss [tpm]	4.91	0.31
MCF7 breast cancer cell line response to EGF1, 07hr, biol_rep1 : CNhs12434 ctss [tpm]	4.71	0.43
MCF7 breast cancer cell line response to EGF1, 07hr, biol_rep2 : CNhs12490 ctss [tpm]	3.29	0
MCF7 breast cancer cell line response to EGF1, 07hr, biol_rep3 : CNhs12752 ctss [tpm]	5.46	1.09
MCF7 breast cancer cell line response to EGF1, 08hr, biol_rep1 : CNhs12565 ctss [tpm]	5.8	0
MCF7 breast cancer cell line response to EGF1, 08hr, biol_rep2 : CNhs12491 ctss [tpm]	0	0
MCF7 breast cancer cell line response to EGF1, 08hr, biol_rep3 : CNhs12753 ctss [tpm]	3.95	0.66
MCF7 breast cancer cell line response to HRG, 00hr15min, biol_rep1 : CNhs12435 ctss [tpm]	60.67	2.83
MCF7 breast cancer cell line response to HRG, 00hr15min, biol_rep2 : CNhs12652 ctss [tpm]	57.57	1.68
MCF7 breast cancer cell line response to HRG, 00hr15min, biol_rep3 : CNhs12754 ctss [tpm]	47.47	1.04
MCF7 breast cancer cell line response to HRG, 00hr30min, biol_rep1 : CNhs12436 ctss [tpm]	68.97	2.22
MCF7 breast cancer cell line response to HRG, 00hr30min, biol_rep2 : CNhs12653 ctss [tpm]	50.9	2.44
MCF7 breast cancer cell line response to HRG, 00hr30min, biol_rep3 : CNhs12755 ctss [tpm]	34.7	1.45
MCF7 breast cancer cell line response to HRG, 00hr45min, biol_rep1 : CNhs12437 ctss [tpm]	25.63	0
MCF7 breast cancer cell line response to HRG, 00hr45min, biol_rep2 : CNhs12654 ctss [tpm]	30.02	1.41
MCF7 breast cancer cell line response to HRG, 00hr45min, biol_rep3 : CNhs12756 ctss [tpm]	25.27	0.95
MCF7 breast cancer cell line response to HRG, 01hr00min, biol_rep1 : CNhs12438 ctss [tpm]	17.02	1.65
MCF7 breast cancer cell line response to HRG, 01hr00min, biol_rep2 : CNhs12655 ctss [tpm]	23.75	1.76
MCF7 breast cancer cell line response to HRG, 01hr00min, biol_rep3 : CNhs12757 ctss [tpm]	8.83	1.02
MCF7 breast cancer cell line response to HRG, 01hr20min, biol_rep1 : CNhs12439 ctss [tpm]	10.32	0.94
MCF7 breast cancer cell line response to HRG, 01hr20min, biol_rep2 : CNhs12656 ctss [tpm]	12.89	0.78
MCF7 breast cancer cell line response to HRG, 01hr20min, biol_rep3 : CNhs12758 ctss [tpm]	10.45	0.33
MCF7 breast cancer cell line response to HRG, 01hr40min, biol_rep1 : CNhs12440 ctss [tpm]	6.29	0.42
MCF7 breast cancer cell line response to HRG, 01hr40min, biol_rep2 : CNhs12657 ctss [tpm]	8.08	0.43
MCF7 breast cancer cell line response to HRG, 01hr40min, biol_rep3 : CNhs12759 ctss [tpm]	7.56	1.03
MCF7 breast cancer cell line response to HRG, 02hr00min, biol_rep1 : CNhs12441 ctss [tpm]	8.47	0
MCF7 breast cancer cell line response to HRG, 02hr00min, biol_rep2 : CNhs12658 ctss [tpm]	2.19	0.73
MCF7 breast cancer cell line response to HRG, 02hr00min, biol_rep3 : CNhs12760 ctss [tpm]	4.17	0.3
MCF7 breast cancer cell line response to HRG, 02hr30min, biol_rep1 : CNhs12442 ctss [tpm]	4.33	0
MCF7 breast cancer cell line response to HRG, 02hr30min, biol_rep2 : CNhs12659 ctss [tpm]	2.32	0.58
MCF7 breast cancer cell line response to HRG, 02hr30min, biol_rep3 : CNhs12761 ctss [tpm]	6.17	0.77
MCF7 breast cancer cell line response to HRG, 03hr00min, biol_rep1 : CNhs12443 ctss [tpm]	3.92	0.44
MCF7 breast cancer cell line response to HRG, 03hr00min, biol_rep2 : CNhs12660 ctss [tpm]	3.72	0.53
MCF7 breast cancer cell line response to HRG, 03hr00min, biol_rep3 : CNhs12762 ctss [tpm]	2.43	0
MCF7 breast cancer cell line response to HRG, 03hr30min, biol_rep1 : CNhs12444 ctss [tpm]	5.41	0
MCF7 breast cancer cell line response to HRG, 03hr30min, biol_rep2 : CNhs12662 ctss [tpm]	2.56	0
MCF7 breast cancer cell line response to HRG, 03hr30min, biol_rep3 : CNhs12763 ctss [tpm]	2.63	0.33
MCF7 breast cancer cell line response to HRG, 04hr, biol_rep1 : CNhs12445 ctss [tpm]	2.31	0
MCF7 breast cancer cell line response to HRG, 04hr, biol_rep2 : CNhs12663 ctss [tpm]	1.61	0.4
MCF7 breast cancer cell line response to HRG, 04hr, biol_rep3 : CNhs12764 ctss [tpm]	3.41	0.76
MCF7 breast cancer cell line response to HRG, 05hr, biol_rep1 : CNhs12446 ctss [tpm]	4.33	0.54
MCF7 breast cancer cell line response to HRG, 05hr, biol_rep2 : CNhs12664 ctss [tpm]	1.02	0
MCF7 breast cancer cell line response to HRG, 05hr, biol_rep3 : CNhs12765 ctss [tpm]	3.69	0.31
MCF7 breast cancer cell line response to HRG, 06hr, biol_rep1 : CNhs12447 ctss [tpm]	2.07	0
MCF7 breast cancer cell line response to HRG, 06hr, biol_rep2 : CNhs12665 ctss [tpm]	1.48	0
MCF7 breast cancer cell line response to HRG, 06hr, biol_rep3 : CNhs12766 ctss [tpm]	4.02	0
MCF7 breast cancer cell line response to HRG, 07hr, biol_rep1 : CNhs12448 ctss [tpm]	2.91	0.58
MCF7 breast cancer cell line response to HRG, 07hr, biol_rep2 : CNhs12666 ctss [tpm]	2.57	1.03
MCF7 breast cancer cell line response to HRG, 07hr, biol_rep3 : CNhs12767 ctss [tpm]	3.1	0
MCF7 breast cancer cell line response to HRG, 08hr, biol_rep1 : CNhs12740 ctss [tpm]	1.68	0.24
MCF7 breast cancer cell line response to HRG, 08hr, biol_rep2 : CNhs12667 ctss [tpm]	1.69	0.56
MCF7 breast cancer cell line response to HRG, 08hr, biol_rep3 : CNhs12768 ctss [tpm]	3.96	0