

Scientific Figure Design

v2.2

Simon Andrews, Anne Segonds-Pichon, Boo Virk

simon.andrews@babraham.ac.uk
anne.segonds-pichon@babraham.ac.uk
bhupinder.virk@babraham.ac.uk

What this course covers...

- Theory of data visualisation
 - Why do some figures work better than others?
- Ethics of data representation
- Elements of graphic design
- Editing bitmap images in GIMP
- Vector editing and compositing in Inkscape
- Journal submissions

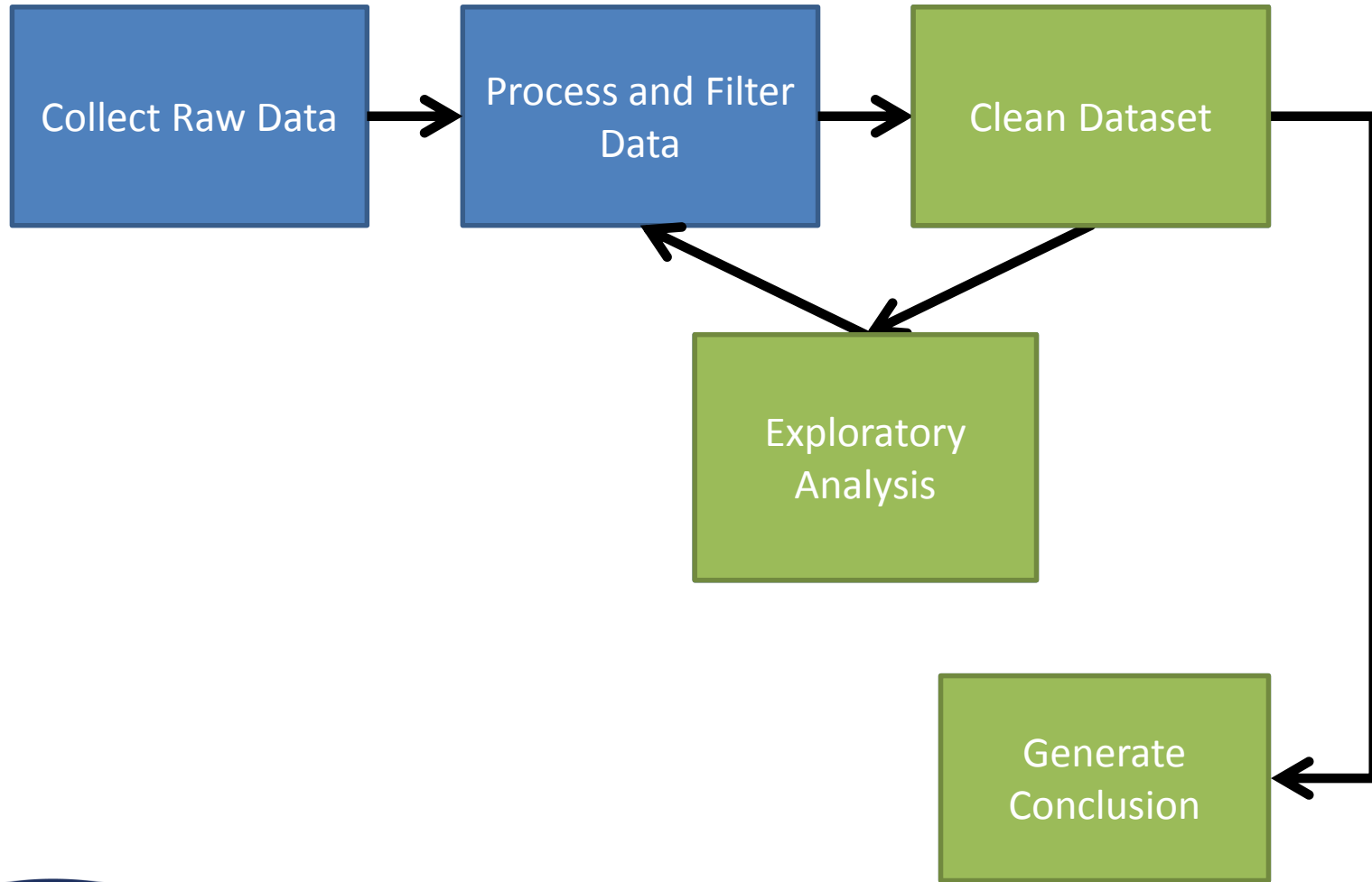
What this course doesn't cover...

- How to draw graphs in specific programs
 - R Introduction
 - Statistics with R
 - Statistics with GraphPad
 - Plotting with R/ggplot
- Network representations
- Spatial data representations

Timetable

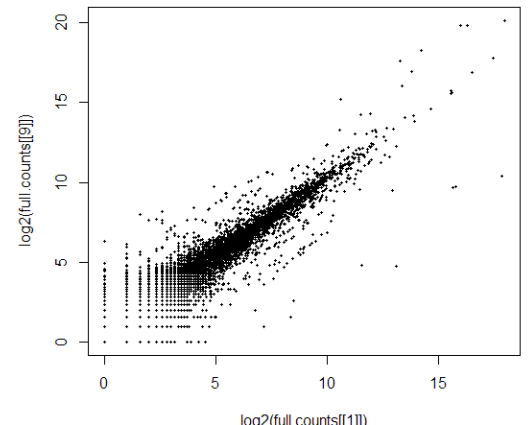
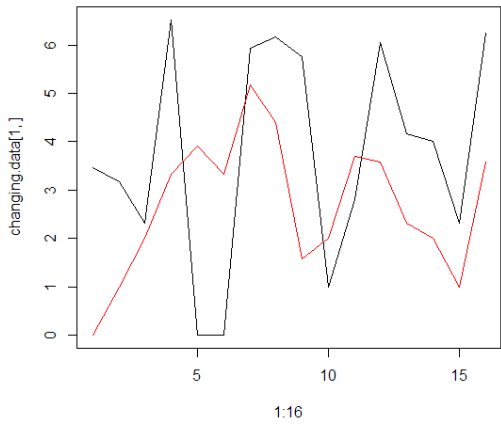
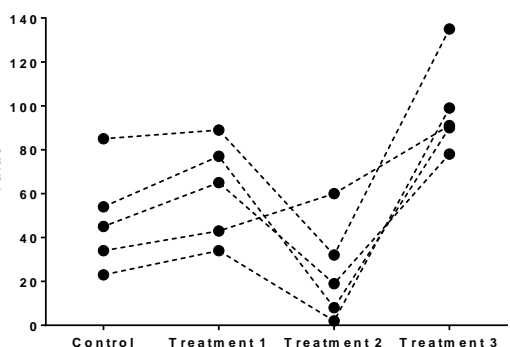
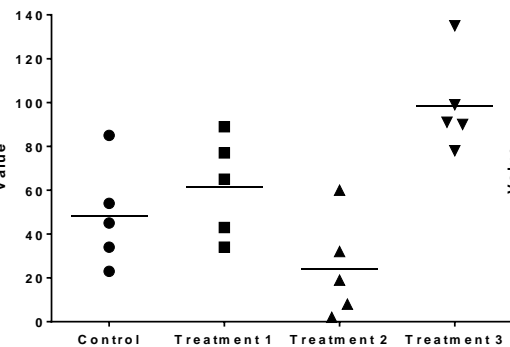
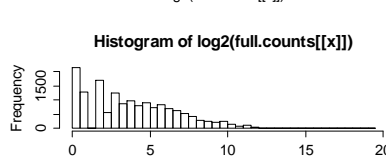
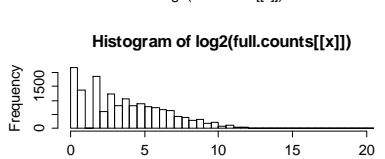
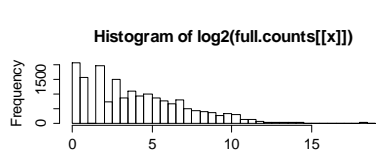
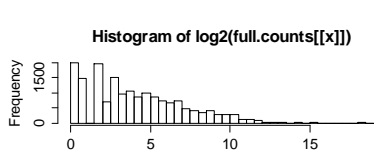
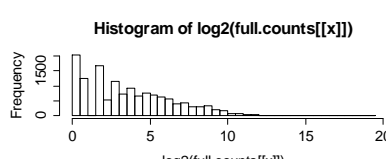
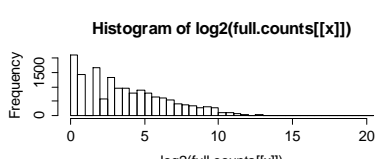
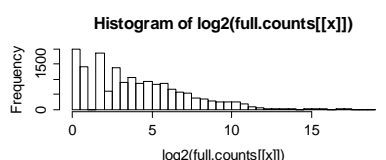
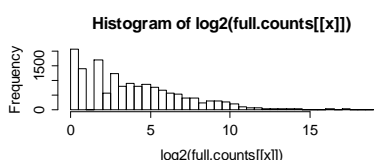
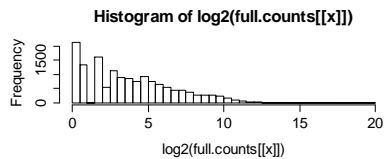
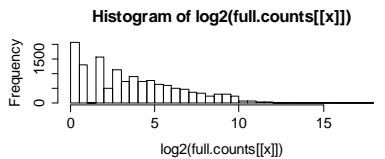
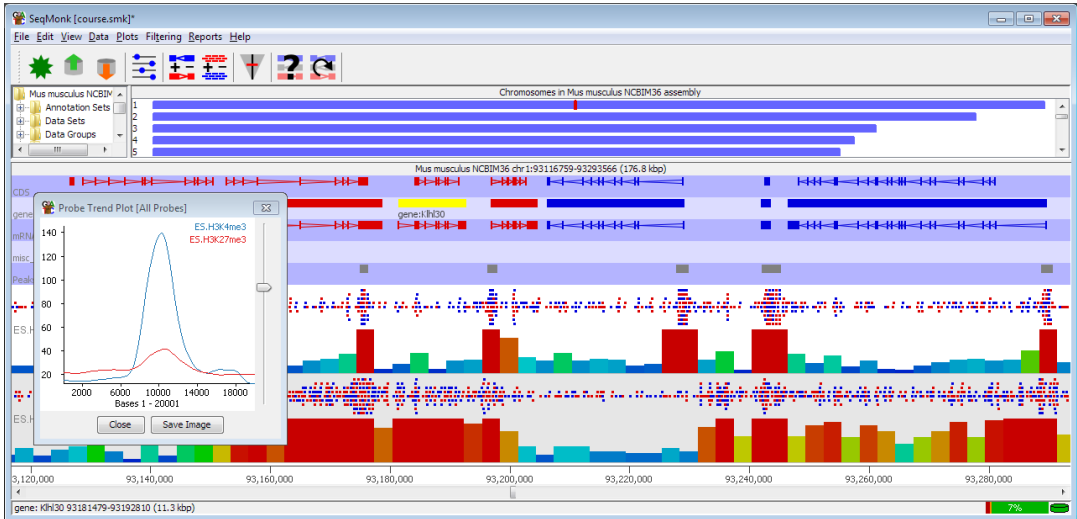
- Morning
 - Introduction
 - Data Visualisation Theory
- Coffee
 - Data Representation Practical
 - Ethics and plots talk
 - Design theory talk
- Afternoon
 - GIMP Tutorial
 - GIMP Practical
- Coffee
 - Inkscape Tutorial
 - Inkscape Practical
 - Final practical

Data Visualisation Process



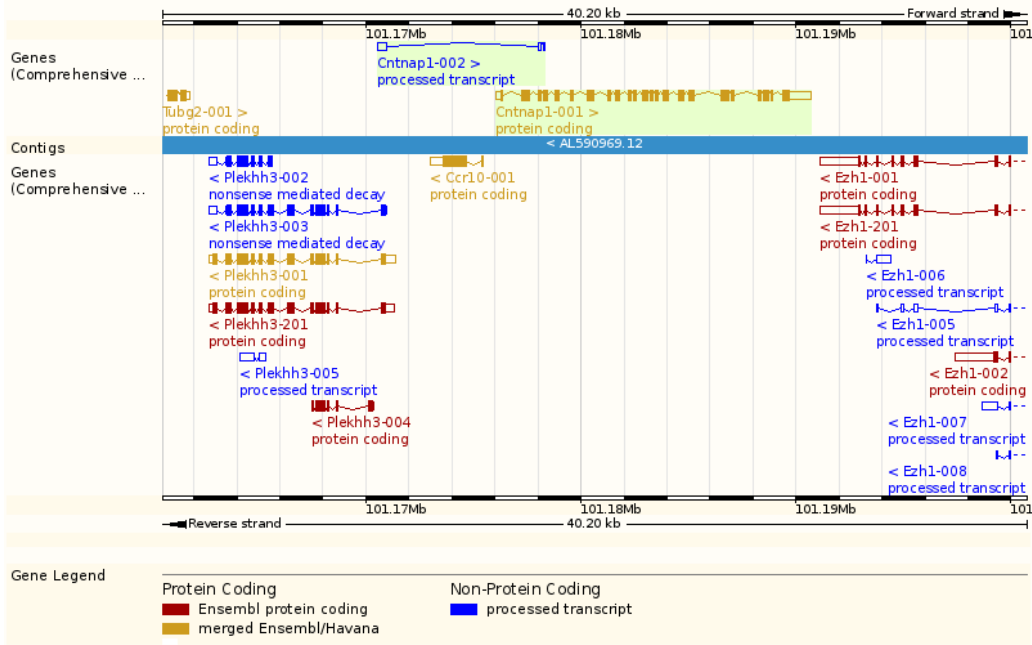
Exploratory visualisation

- Understand your data
- Multiple ways to present and summarise
- Crude representations
- Interactive
- Not intended for final publication
 - Can be adapted for publication



Reference visualisation

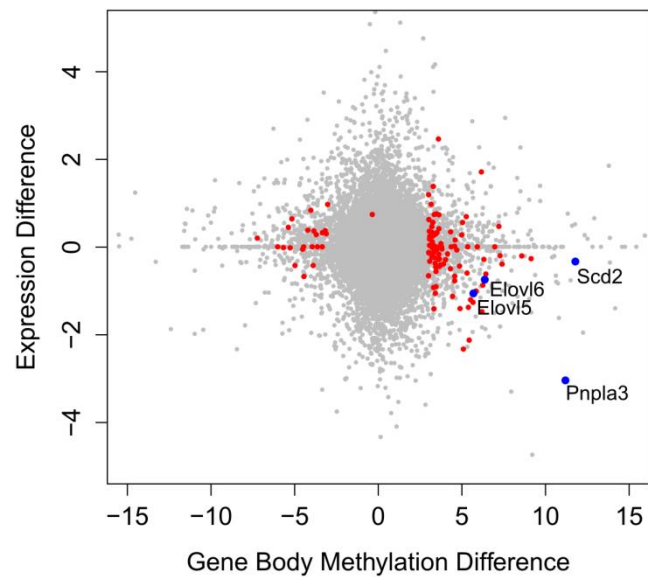
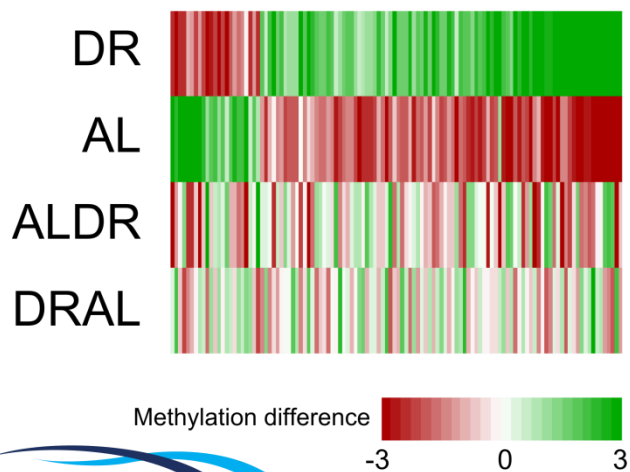
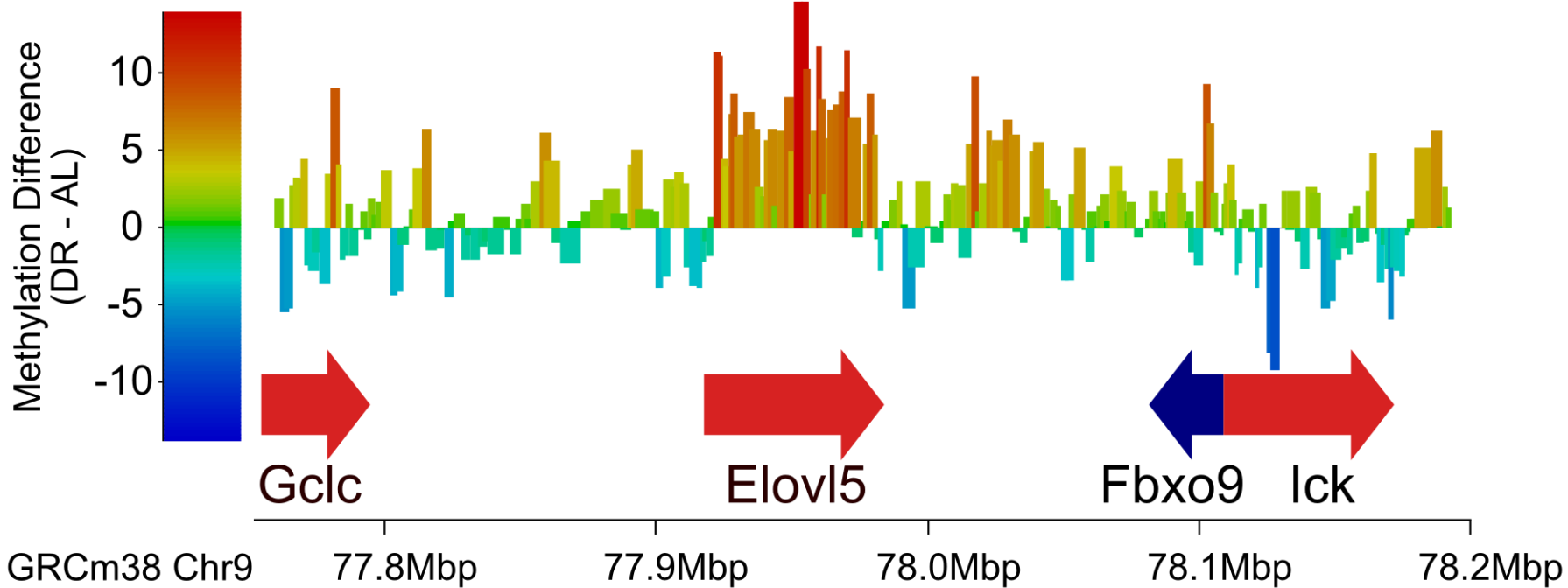
- Using your data as a resource
- Allows users to look up data of interest
- Tabular / Configurable
- Interactive



Chr	Start	End	Average ...	Feature	ID	Description	No. Su...	No. Pro...	Mean ...	StDev ...	Mea...	STD...
1	91285982	91726453		Centg2	ENSMUSG0000...	centaurin, gamma 2 [Source:Ma...	1	148	19.216	22.845	16.235	7.427
1	91759133	91762347		Gbx2	ENSMUSG0000...	gastrulation brain homeobox 2...	1	2	321.5	137.886	89.343	36.373
1	91783849	91845748		Asb18	ENSMUSG0000...	ankyrin repeat and SOCS box...	1	22	22.227	30.095	47.379	39.908
1	91873797	91920700		Iqca	ENSMUSG0000...	IQ motif containing with AAA d...	1	17	11.706	5.665	21.977	6.709
1	91958628	91976324		Iqca	ENSMUSG0000...	IQ motif containing with AAA d...	1	7	7.429	3.207	23.786	4.68
1	92035174	92047459		Cxcr7	ENSMUSG0000...	chemokine (C-X-C motif) recep...	1	5	30.8	31.523	20.034	6.862
1	92433385	92443499		Cops8	ENSMUSG0000...	COP9 (constitutive photomorp...	1	5	47.4	70.692	13.266	3.371
1	92505565	92510197		EG433332	ENSMUSG0000...	predicted gene, EG433332 [So...	1	2	7.5	3.536	20.305	1.914
1	92596517	92674334		Col6a3	ENSMUSG0000...	procollagen, type VI, alpha 3 [...]	1	27	8.296	3.821	26.773	8.431
1	92745509	92781547		Mlph	ENSMUSG0000...	melanophilin [Source:MarkerSy...	1	13	17.077	13.175	32.384	13.865
1	92783511	92784418		LOC633040	ENSMUSG0000...	No description	1	2	14	1.414	28.427	9.572
1	92788541	92800026		Rab17	ENSMUSG0000...	RAB17, member RAS oncogen...	1	5	19.6	15.388	40.881	12.892
1	92829210	92958602		Lrrflp1	ENSMUSG0000...	leucine rich repeat (in FLII) int...	1	45	23.156	40.155	21.93	21.654
1	92975509	93001201		Gm817	ENSMUSG0000...	gene model 817, (NCBI) [Sou...	1	10	12.8	14.65	14.484	7.221
1	93010229	93054126		Ramp1	ENSMUSG0000...	receptor (calcitonin) activity m...	1	15	15.067	13.593	39.979	20.337
1	93054380	93055601		9130218E1...	ENSMUSG0000...	RIKEN cDNA 9130218E19 gen...	1	2	12.5	2.121	35.872	0.957
1	93114058	93115422		Ube2f	ENSMUSG0000...	ubiquitin-conjugating enzyme ...	1	2	5	4.243	5.415	3.829
1	93126451	93127342		ENSMUSG0...	ENSMUSG0000...	No description	1	1	218	0	14.89	0
1	93128744	93151480		Sdy	ENSMUSG0000...	selenocysteine lyase [Source...	1	9	37.889	68.054	15.492	7.038
1	93152481	93178709		Espnl	ENSMUSG0000...	espin-like [Source:MarkerSym...	1	10	20.8	28.44	66.33	64.176
1	93181479	93192810		Klhl30	ENSMUSG0000...	kelch-like 30 (Drosophila) [Sou...	1	5	11.6	5.177	41.423	5.029
1	93196836	93204622		BC056923	ENSMUSG0000...	cDNA sequence BC056923 [So...	1	4	61.75	84.626	27.412	22.199
1	93206237	93229189		Iikap	ENSMUSG0000...	integrin-linked kinase-associat...	1	9	42.222	66.944	11.431	2.451
1	93241889	93243628		Hes6	ENSMUSG0000...	hairy and enhancer of split 6 (...]	1	2	190	31.113	71.745	26.801
1	93246388	93289702		Per2	ENSMUSG0000...	period homolog 2 (Drosophila) [...]	1	16	33.562	60.427	38.834	26.818
1	93325073	9338670		Traf3ip1	ENSMUSG0000...	TNF receptor-associated facto...	1	12	30.083	72.455	13.086	6.513
1	93371120	93389585		Asb1	ENSMUSG0000...	ankyrin repeat and SOCS box...	1	7	51.857	105.506	12.957	5.841
1	93631867	93678434		Twist2	ENSMUSG0000...	twist homolog 2 (Drosophila) [...]	1	17	18.765	31.888	53.51	76.591
1	93760418	93760711		Hdac4	ENSMUSG0000...	histone deacetylase 4 [Source...	1	1	28	0	13.537	0
1	93763364	93885379		Hdac4	ENSMUSG0000...	histone deacetylase 4 [Source...	1	41	12.024	4.396	12.183	4.227
1	94269894	94304205		Ndufa10	ENSMUSG0000...	NADH dehydrogenase (ubiquin...	1	12	41.75	110.694	12.747	3.288

Illustrative visualisation

- Intended to convey a specific point
 - Carefully chosen subset of data
 - Optimised presentation
 - Good design
-
- Used for figures in papers



What makes a good figure?

- Has a clear message
 - Helps to tell a story
 - Adds to the text, and links to it
- Is focussed
 - Don't confuse one message with another
- Is easy to interpret correctly
 - Good data visualisation
 - Good design
- Is an honest and true reflection of the data