## **Scatter Plot and MA Plot**

- Scatter Plot
- MA Plot

## Scatter Plot

A scatter plot is a simple way to visualize differentially expressed genes. We can plot a scatter plot with gene expression values for two samples at one time. While most probe(sets)/genes fall on a 45° line, up- or down-regulated genes are positioned above or below the line.

To draw a scatter plot, you first need to transpose the original intensities spreadsheet so that the samples are on columns and probe(sets)/genes are on rows.

- Select the main spreadsheet
- Select **Transform** from the main toolbar
- Select Create Transposed Spreadsheet...
- Select the column with sample IDs from the drop-down menu
- Select OK

A new temporary spreadsheet will be created with probe(sets)/genes on rows and samples on columns.

- · Select the two sample columns you would like to compare
- Select View from the main toolbar
- Select Scatter Plot (Figure 1)

Partek Genomics Su	ite - 2 (ptmp38 *)	ole Wi	ndow Cust	m Help									-	
cuit mansform	Profiles +										Workflows Choose			
vsis ×	Box & Whiskers											_		
	Histograms  Star Plot Scatter Plot		7	QT	?									
1 (Breast Cancer.tx	Dot Plot(s)	Curren	t Selection 10	0_g_at										
2 (ptmp38) *	Probability Plot	1	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
	XY Plot / Barchart		ID	Control-0	Control-0	E2-8	E2-8	E2-48	E2-48	E2+ICI-8	E2+ICI-8	E2+ICI-48	E2+ICI-48	E2+Ral-8
	Venn Diagram	1.	100_g_aq	6 52926	7.07094	6 97774	6.01000	6 90240	6.09092	6.91624	7.00092	6 71600	6 77015	6 5157
	Violin Plot	2.	101_at	1 00752	2 74416	4 40195	2 12102	4 65525	2 07774	2 52605	2 76552	4 24241	2.01702	2 2505
	Cluster Genome	4	102_at	2 58496	2 82782	5 24413	3 3505	3.01792	4 27708	3 41054	2.70333	3 01649	3 0542	3 20163
	Chromosome View	5	103_at	5 25172	4 50006	5 17303	4 84708	5 3505	4 50604	4 20045	4 00005	5 18587	4 78136	5 3147
	Karyogram View	6	101_at	2 82782	4 17702	2 10434	1.80735	2 26303	2 53605	3 48543	1 58496	4.03562	4 32103	2 80735
	MA Plot	7	105_at	2.23266	1.96347	2.40599	2.1375	1.80735	2.07039	2,70044	2.16993	1.80735	1.20163	1.88753
		8	107_at	2,29278	3.03562	4,99548	3.26303	5,23649	3.40599	3,59694	3,3505	4.9542	3.62059	3,7866
		9.	108 g at	7,33539	7.04767	7,55228	7.06609	6.97384	7.30195	6,95536	7.01903	7.3156	7.22882	7.04985
		10.	109 at	7.64169	7.02459	7.65964	7.92303	7.82209	7.54303	7.62498	7,75556	7.81762	7.29002	7,56605
		11.	110 at	4.6837	4.8679	5.21335	4.59694	5.00899	4.47897	4.97269	5.20945	5.33985	4.80735	5.07895
		12.	111 at	7.72724	7.8009	7.39403	7.61102	7.88142	7.6388	7.58496	7.58195	7.40939	7.54303	7.5812
		13.	112 g at	4.70044	4.14568	4.79701	1.80735	3.45943	3.88753	4.23266	3.62059	4.51728	4.1375	3.85798
		14.	113 i at	3.75489	3.07039	4.50462	3.73335	4.22497	4.8125	3.05311	3.21723	2.26303	2.20163	2.23266
		15.	114_r_at	1.848	1.848	1.926	1.63227	2.07039	1.63227	1.32193	1.43296	1.80735	1.48543	1.88753
		16.	115_at	6.2384	6.48059	6.04002	6.06393	6.71425	6.07682	5.98413	5.82528	6.1639	5.64097	6.50621
		17.	116_at	5.12928	5.12516	4.98641	4.62644	4.8125	3.91648	5.25172	4.27053	5.4822	4.45286	4.10434
		18.	117_at	5.03562	4.66107	5.17792	2.37851	5.1375	4.36457	4.12928	4.18587	4.71699	3.01792	4.27798
		19.	118_at	2.03562	3	2.96347	2.76553	3.23266	3.30743	3.80735	2.7866	3.44626	2.32193	2.67807
		20.	119_at	0	0	0	0	0	0	0	0	0	0	0
		21.	120_at	3.07039	4.05311	4.24031	2.43296	4.1127	3.23266	3.88753	3.07039	5.10852	3.36457	1.848
		22.	121_at	8.53605	8.43338	8.53566	8.01848	8.73166	8.33673	8.57856	8.19081	8.84862	8.39575	8.67701
	>	Rows:	12626 Column	s: 19 🔨										>

Figure 5. Invoking a scatter plot from a spreadsheet with probe(sets)/genes on rows and samples on columns

- Select Yes when asked if you want to only use the selected columns
- Select Yes when asked if you are sure you would like to draw the scatter plot

The scatter plot will open in a new tab. We can add a regression line to the plot.

- Select ( *statestical* ) from the plot command bar
- Select Axes
- Select Set Regression Lines
- Select Regression line of y on x
- Set *Line Width* to 5
- Select OK (Figure 2)



Figure 6. Configuring a regression line

• Select OK to close the Plot Rendering Properties dialog

The scatter plot now features a regression line dividing the probe(sets)/genes (Figure 3) Partek Genomics Suite - 2 (ptmp38 \*) × File View Help Workflows Choose. Analysis × Scatter Plot × ¢ Color by 2. Control-0 Size by Auto Shape by Fixed Connect by None ~ 2D/3D **1** Scatterplot of 2 С 14 11 C Regression Line r= 0.937498 8 E2-8 5 2 -1 -1 2 5 8 11 14 Control-0

Figure 7. Each dot on the plot represents the intensity value of a probe(set)/gene

## MA Plot

The MA plot can be used to display a difference in expression patterns between two samples. The horizontal axis (A) shows the average intensity while the vertical axis (M) shows the intensity ratio between the two samples for the same data point. In essence, an MA plot is a scatter plot tilted to the side so that the differentially expressed probe(sets)/genes are located above or below the 0 value of M. An MA plot is also useful to visualize the results of normalization where you would hope to see the median of the values follow a horizontal line.

The MA plot is invoked on the original intensities spreadsheet with any need for transposition.

- Select View from the main toolbar
- Select MA Plot





Figure 8. MA plot comparing the expression levels between two samples. Each dot on the plot represents a single genomic feature (gene or probe set). The average signal for each genomic feature is shown on the horizontal axis (A), while the ratio is shown on the vertical axis (M).

The samples displayed can be changed using the select sample menus on the left-hand side.

« Volcano Plot Sort Rows by Prototype »

## Additional Assistance

If you need additional assistance, please visit our support page to submit a help ticket or find phone numbers for regional support.



Your Rating: ☆☆☆☆☆ Results: ★★★★ 34 rates