Amacrin cells

One-way Analysis of Variance (ANOVA)

The P value is 0.2551, considered not significant.
Variation among column means is not significantly greater than expected by chance.

Post tests
Post tests were not calculated because the P value was greater than 0.05.

Assumption test: Are the standard deviations of the groups equal?

ANOVA assumes that the data are sampled from populations with identical SDs. This assumption is tested using the method of Bartlett.

Bartlett statistic (corrected) = 7.751
The P value is 0.0515.
Bartlett's test suggests that the differences among the SDs is not quite significant.

Assumption test: Are the data sampled from Gaussian distributions?

ANOVA assumes that the data are sampled from populations that follow Gaussian distributions. This assumption is tested using the method Kolmogorov and Smirnov:

Group	KS	P Value	Passed normality test?
GFP	0.3467	>0.10	Yes
Xotx5b	0.1608	>0.10	Yes
Xotx2	0.1952	>0.10	Yes
Xotx2Mut3/1	0.1904	>0.10	Yes

Intermediate calculations. ANOVA table

Source of variation	Degrees of freedom	Sum of squares	Mean square
Treatments (between columns)	3	28.332	9.444
Residuals (within columns)	38	254.70	6.703
Total	41	283.03	

F = 1.409 =(MStreatment/MSresidual)

Summary of Data

Group	Number of Points	Mean	Standard Deviation	Standard Error of Mean	Median
GFP	9	11.330	1.091	0.3637	10.949
Xotx5b	10	11.911	2.937	0.9286	11.556
Xotx2	9	9.573	2.566	0.8552	9.821

Xotx2Mut3/1	14	10.689	2.973	0.7946	9.830

Group	Minimum	Maximum	95% Confidence Interval From	To
GFP	10.448	14.063	10.492	12.169
Xotx5b	8.197	18.367	9.810	14.011
Xotx2	6.383	13.462	7.601	11.545
Xotx2Mut3/1	6.250	16.000	8.973	12.405

* * *

Bipolar cells

One-way Analysis of Variance (ANOVA)

The P value is < 0.0001, considered extremely significant.
Variation among column means is significantly greater than expected by chance.

Tukey-Kramer Multiple Comparisons Test

If the value of q is greater than 3.802 then the P value is less than 0.05.

Comparison	Mean Difference	q	P value
GFP vs Xotx5b	2.403	1.986	ns P>0.05
GFP vs Xotx2	-8.810	7.094	*** P<0.001
GFP vs Xotx2Mut3/1	1.431	1.271	ns P>0.05
Xotx5b vs Xotx2	-11.213	9.264	*** P<0.001
Xotx5b vs Xotx2Mut3/1	-0.9729	0.8920	ns P>0.05
Xotx2 vs Xotx2Mut3/1	10.240	9.099	*** P<0.001

Difference	Mean Difference	95% Confidence Interval From	To
GFP - Xotx5b	2.403	-2.198	7.005
GFP - Xotx2	-8.810	-13.531	-4.089
GFP - Xotx2Mut3/1	1.431	-2.848	5.709
Xotx5b - Xotx2	-11.213	-15.815	-6.612
Xotx5b - Xotx2Mut3/1	-0.9729	-5.119	3.174
Xotx2 - Xotx2Mut3/1	10.240	5.962	14.519

Assumption test: Are the standard deviations of the groups equal?

ANOVA assumes that the data are sampled from populations with identical SDs. This assumption is tested using the method of Bartlett.

Bartlett statistic (corrected) = 13.580
The P value is 0.0035.
Bartlett's test suggests that the differences among the SDs is very significant.
Since ANOVA assumes populations with equal SDs, you should consider transforming your data (reciprocal or log) or selecting a nonparametric test.

Assumption test: Are the data sampled from Gaussian distributions?

ANOVA assumes that the data are sampled from populations that follow Gaussian distributions. This assumption is tested using the method Kolmogorov and Smirnov:

Group	KS	P Value	Passed normality test?

GFP	0.2287	>0.10	Yes
Xotx5b	0.1773	>0.10	Yes
Xotx2	0.3268	>0.10	Yes
Xotx2Mut3/1	0.1750	>0.10	Yes

Intermediate calculations. ANOVA table

Source of variation	Degrees of freedom	Sum of squares	Mean square
Treatments (between columns)	3	755.39	251.80
Residuals (within columns)	38	527.39	13.879
Total	41	1282.8	

F = 18.143 =(MStreatment/MSresidual)

Summary of Data

Group	Number of Points	Mean	Standard Deviation	Standard Error of Mean	Median
GFP	9	33.376	1.436	0.4787	33.333
Xotx5b	10	30.972	3.094	0.9783	31.140
Xotx2	9	42.186	2.778	0.9261	43.802
Xotx2Mut3/1	14	31.945	5.284	1.412	33.333

Group	Minimum	Maximum	95% Confidence Interval From	To
GFP	31.429	36.036	32.272	34.480
Xotx5b	25.758	34.483	28.760	33.185
Xotx2	37.500	44.231	40.050	44.321
Xotx2Mut3/1	22.826	37.778	28.895	34.996

* * *

Photoreceptors

One-way Analysis of Variance (ANOVA)

The P value is < 0.0001, considered extremely significant.
Variation among column means is significantly greater than expected by chance.

Tukey-Kramer Multiple Comparisons Test

If the value of q is greater than 3.802 then the P value is less than 0.05.

Comparison	Mean Difference	q	P value
GFP vs Xotx5b	-8.172	7.882	*** P<0.001
GFP vs Xotx2	4.170	3.920	* P<0.05
GFP vs Xotx2Mut3/1	-6.288	6.522	*** P<0.001
Xotx5b vs Xotx2	12.341	11.904	*** P<0.001
Xotx5b vs Xotx2Mut3/1	1.884	2.016	ns P>0.05
Xotx2 vs Xotx2Mut3/1	-10.458	10.847	*** P<0.001

Difference	Mean Difference	95% Confidence Interval From	To
GFP - Xotx5b	-8.172	-12.113	-4.230
GFP - Xotx2	4.170	0.1257	8.214
GFP - Xotx2Mut3/1	-6.288	-9.953	-2.623
Xotx5b - Xotx2	12.341	8.400	16.283
Xotx5b - Xotx2Mut3/1	1.884	-1.668	5.436
Xotx2 - Xotx2Mut3/1	-10.458	-14.123	-6.792

Assumption test: Are the standard deviations of the groups equal?

ANOVA assumes that the data are sampled from populations with identical SDs. This assumption is tested using the method of Bartlett.

Bartlett statistic (corrected) = 18.776
The P value is 0.0003.
Bartlett's test suggests that the differences among the SDs is extremely significant.
Since ANOVA assumes populations with equal SDs, you should consider transforming your data (reciprocal or log) or selecting a nonparametric test.

Assumption test: Are the data sampled from Gaussian distributions?

ANOVA assumes that the data are sampled from populations that follow Gaussian distributions. This assumption is tested using the method Kolmogorov and Smirnov:

Group	KS	P Value	Passed normality test?

GFP	0.2934	>0.10	Yes
Xotx5b	0.2542	>0.10	Yes
Xotx2	0.3169	>0.10	Yes
Xotx2Mut3/1	0.2103	>0.10	Yes

Intermediate calculations. ANOVA table

Source of variation	Degrees of freedom	Sum of squares	Mean square
Treatments (between columns)	3	961.50	320.50
Residuals (within columns)	38	386.96	10.183
Total	41	1348.5	

F = 31.474 =(MStreatment/MSresidual)

Summary of Data

Group	Number of Points	Mean	Standard Deviation	Standard Error of Mean	Median
GFP	9	30.146	1.220	0.4066	30.631
Xotx5b	10	38.318	2.331	0.7371	37.818
Xotx2	9	25.976	1.790	0.5965	26.786
Xotx2Mut3/1	14	36.434	4.808	1.285	36.420

Group	Minimum	Maximum	95% Confidence Interval From	To
GFP	27.143	31.250	29.208	31.084
Xotx5b	36.364	44.262	36.650	39.985
Xotx2	22.034	27.660	24.601	27.352
Xotx2Mut3/1	30.667	44.262	33.658	39.209

* * *

Ganglion cells

One-way Analysis of Variance (ANOVA)

The P value is 0.0241, considered significant.
Variation among column means is significantly greater than expected by chance.

Tukey-Kramer Multiple Comparisons Test

If the value of q is greater than 3.802 then the P value is less than 0.05.

Comparison	Mean Difference	q	P value
GFP vs Xotx5b	3.576	3.222	ns P>0.05
GFP vs Xotx2	0.5766	0.5064	ns P>0.05
GFP vs Xotx2Mut3/1	3.824	3.706	ns P>0.05
Xotx5b vs Xotx2	-2.999	2.703	ns P>0.05
Xotx5b vs Xotx2Mut3/1	0.2483	0.2483	ns P>0.05
Xotx2 vs Xotx2Mut3/1	3.248	3.147	ns P>0.05

Difference	Mean Difference	95% Confidence Interval From	To
GFP - Xotx5b	3.576	-0.6430	7.795
GFP - Xotx2	0.5766	-3.752	4.905
GFP - Xotx2Mut3/1	3.824	-0.09885	7.747
Xotx5b - Xotx2	-2.999	-7.218	1.220
Xotx5b - Xotx2Mut3/1	0.2483	-3.554	4.050
Xotx2 - Xotx2Mut3/1	3.248	-0.6754	7.171

Assumption test: Are the standard deviations of the groups equal?

ANOVA assumes that the data are sampled from populations with identical SDs. This assumption is tested using the method of Bartlett.

Bartlett statistic (corrected) = 3.523
The P value is 0.3178.
Bartlett's test suggests that the differences among the SDs is not significant.

Assumption test: Are the data sampled from Gaussian distributions?

ANOVA assumes that the data are sampled from populations that follow Gaussian distributions. This assumption is tested using the method Kolmogorov and Smirnov:

Group	KS	P Value	Passed normality test?
GFP	0.1481	>0.10	Yes
Xotx5b	0.1987	>0.10	Yes
Xotx2	0.2671	>0.10	Yes

Xotx2Mut3/1 0.1486 >0.10 Yes

Intermediate calculations. ANOVA table

Source of variation	Degrees of freedom	Sum of squares	Mean square
Treatments (between columns)	3	123.04	41.013
Residuals (within columns)	38	443.33	11.666
Total	41	566.37	

F = 3.515 =(MStreatment/MSresidual)

Summary of Data

Group	Number of Points	Mean	Standard Deviation	Standard Error of Mean	Median
GFP	9	17.667	2.058	0.6861	17.308
Xotx5b	10	14.091	4.016	1.270	13.076
Xotx2	9	17.091	3.748	1.249	15.000
Xotx2Mut3/1	14	13.843	3.418	0.9136	13.398

Group	Minimum	Maximum	95% Confidence Interval From	To
GFP	14.583	20.896	16.085	19.249
Xotx5b	9.836	21.212	11.218	16.964
Xotx2	13.077	22.034	14.210	19.972
Xotx2Mut3/1	8.333	19.565	11.870	15.816

* * *

Horizontal cells

One-way Analysis of Variance (ANOVA)

The P value is 0.0230, considered significant.
Variation among column means is significantly greater than expected by chance.

Tukey-Kramer Multiple Comparisons Test

If the value of q is greater than 3.802 then the P value is less than 0.05.

Comparison	Mean Difference	q	P value
GFP vs Xotx5b	2.773	3.676	ns P>0.05
GFP vs Xotx2	2.306	2.980	ns P>0.05
GFP vs Xotx2Mut3/1	0.3919	0.5588	ns P>0.05
Xotx5b vs Xotx2	-0.4663	0.6183	ns P>0.05
Xotx5b vs Xotx2Mut3/1	-2.381	3.503	ns P>0.05
Xotx2 vs Xotx2Mut3/1	-1.914	2.730	ns P>0.05

Difference	Mean Difference	95% Confidence Interval From	To
GFP - Xotx5b	2.773	-0.09475	5.640
GFP - Xotx2	2.306	-0.6356	5.248
GFP - Xotx2Mut3/1	0.3919	-2.274	3.058
Xotx5b - Xotx2	-0.4663	-3.334	2.401
Xotx5b - Xotx2Mut3/1	-2.381	-4.965	0.2031
Xotx2 - Xotx2Mut3/1	-1.914	-4.581	0.7519

Assumption test: Are the standard deviations of the groups equal?

ANOVA assumes that the data are sampled from populations with identical SDs. This assumption is tested using the method of Bartlett.

Bartlett statistic (corrected) = 0.4805
The P value is 0.9232.
Bartlett's test suggests that the differences among the SDs is not significant.

Assumption test: Are the data sampled from Gaussian distributions?

ANOVA assumes that the data are sampled from populations that follow Gaussian distributions. This assumption is tested using the method Kolmogorov and Smirnov:

Group	KS	P Value	Passed normality test?
GFP	0.2394	>0.10	Yes
Xotx5b	0.1263	>0.10	Yes
Xotx2	0.2466	>0.10	Yes

Xotx2Mut3/1 0.1470 >0.10 Yes

Intermediate calculations. ANOVA table

Source of variation	Degrees of freedom	Sum of squares	Mean square
Treatments (between columns)	3	57.543	19.181
Residuals (within columns)	38	204.77	5.389
Total	41	262.32	

F = 3.559 =(MStreatment/MSresidual)

Summary of Data

Group	Number of Points	Mean	Standard Deviation	Standard Error of Mean	Median
GFP	9	7.481	2.196	0.7321	6.771
Xotx5b	10	4.708	2.633	0.8328	5.137
Xotx2	9	5.174	2.334	0.7780	5.085
Xotx2Mut3/1	14	7.089	2.152	0.5751	7.065

Group	Minimum	Maximum	95% Confidence Interval From	To
GFP	5.405	11.429	5.793	9.169
Xotx5b	0.000	8.197	2.824	6.592
Xotx2	1.923	9.231	3.380	6.969
Xotx2Mut3/1	3.125	9.836	5.847	8.331

* * *