

ddx3x-stress-granules-analyses

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Summary

This is a Quarto book.

To learn more about Quarto books visit <https://quarto.org/docs/books>.

1 Plots of results

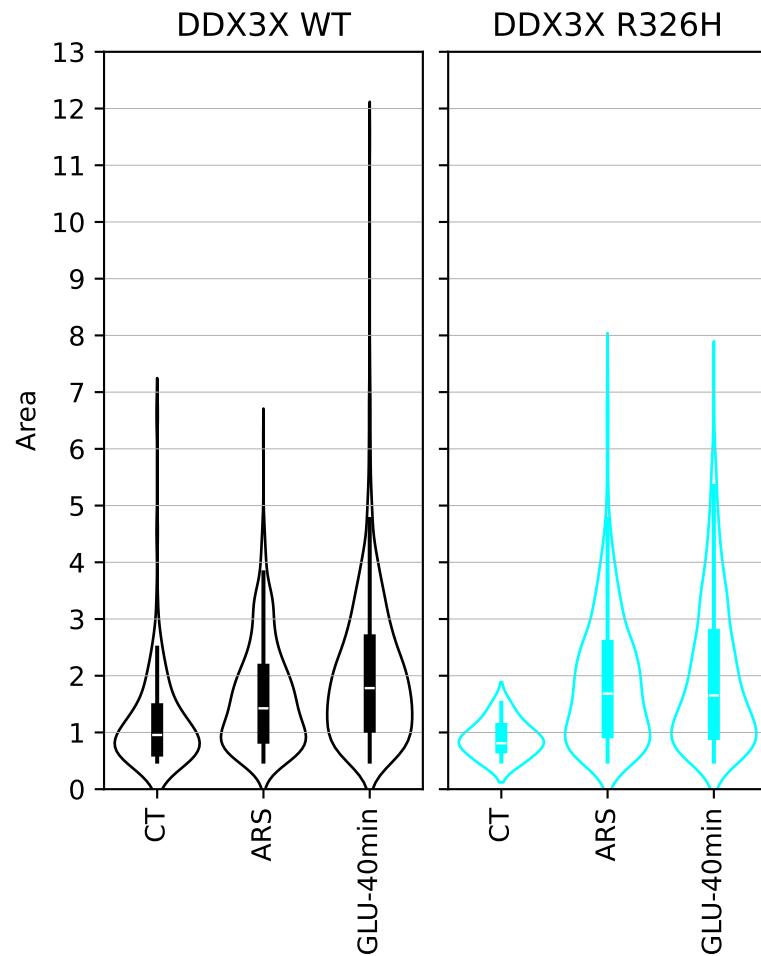


Figure 1.1: Violin plots of stress granule area.

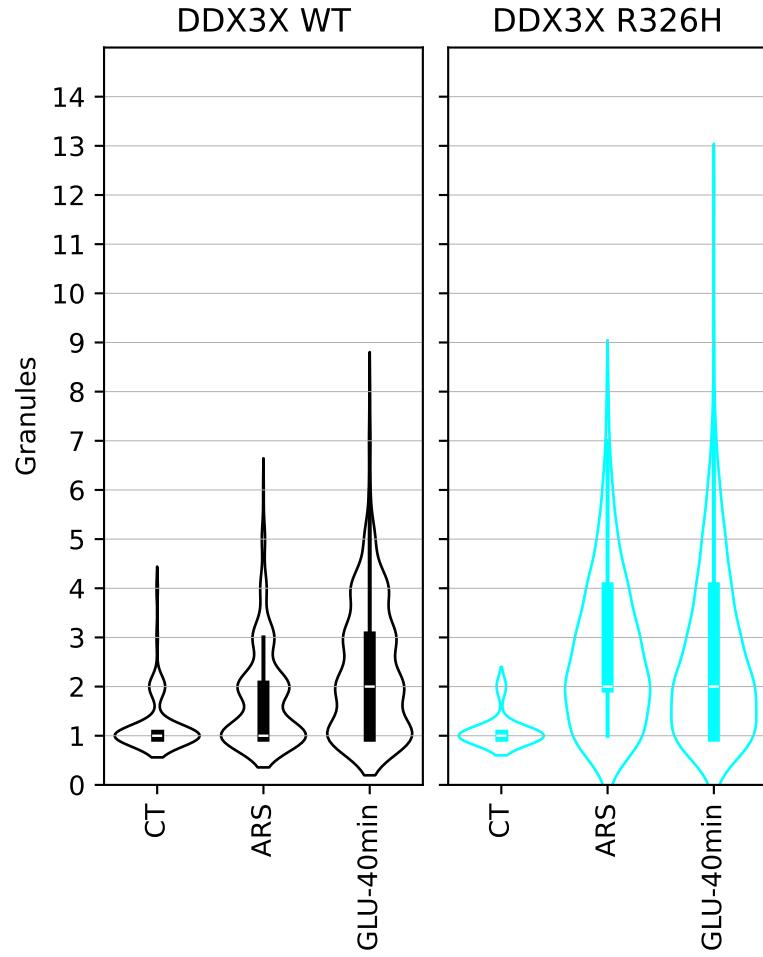


Figure 1.2: Violin plots of stress granule count per cell excluding cells with zero stress granules.

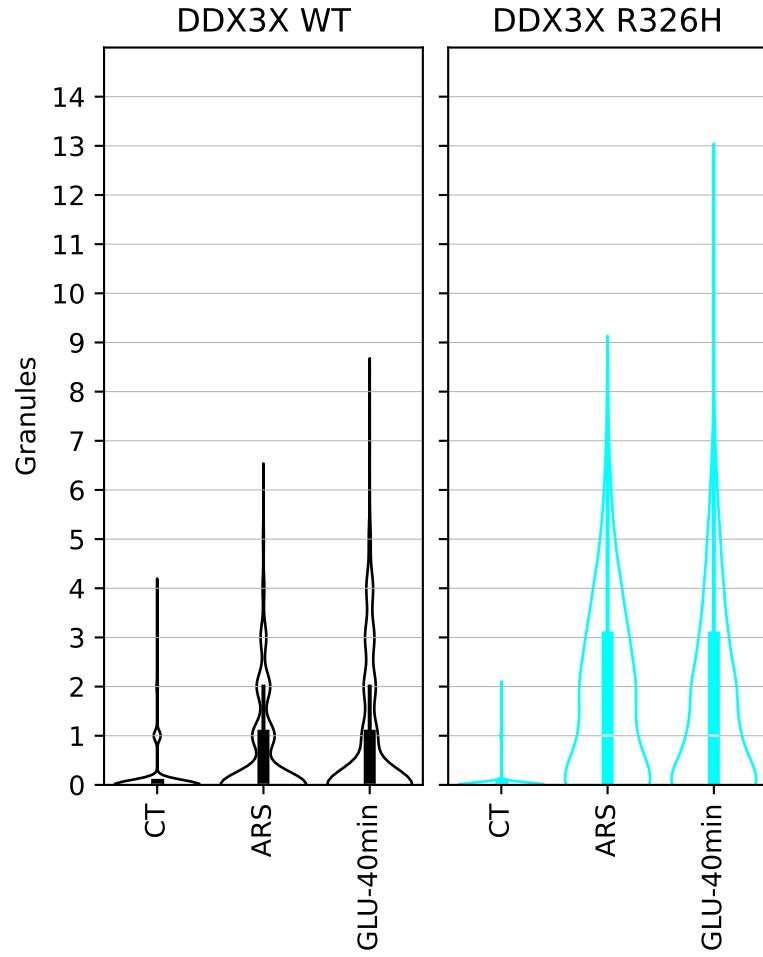
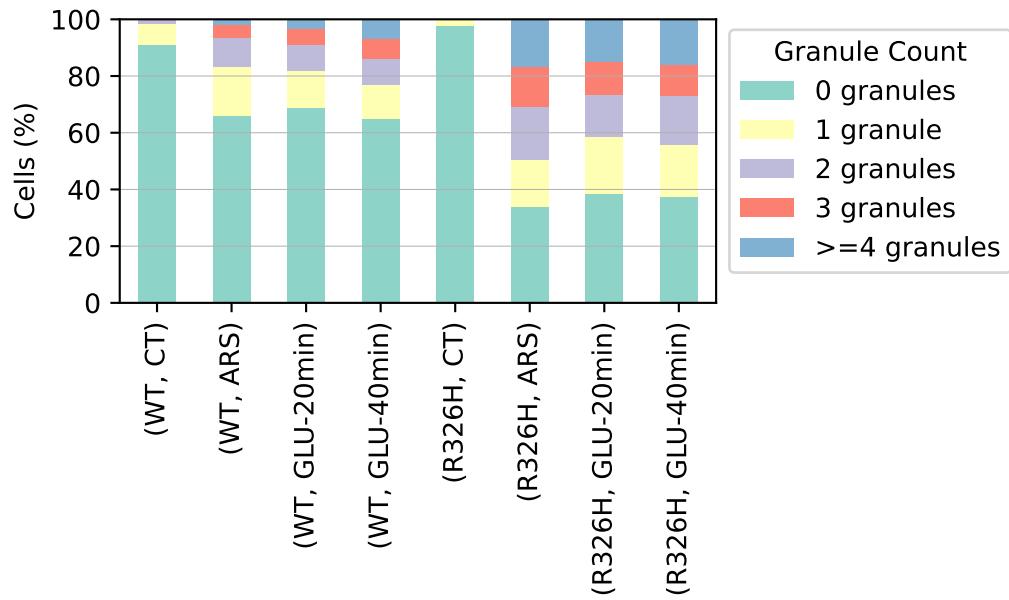


Figure 1.3: Violin plots of stress granule count per cell.



2 Statistical analyses

Statistical analyses were conducted using Python's Pingouin library (version 5.5) to evaluate differences between groups. The Mann-Whitney U test was employed to compare group similarities with respect to stress granules area and the count of stress granules per cell, as this non-parametric test is appropriate for assessing differences between two independent groups without assuming normality of data distribution. Statistical significance was determined at a p-value threshold of 0.05, with results reported as median values and interquartile ranges to appropriately represent the distribution of non-normally distributed data (boxplots and violinplots).

```
array(['R326H_GLU-40min', 'R326H_AR5', 'R326H_GLU-20min', 'R326H_CT',
       'WT_CT', 'WT_AR5', 'WT_GLU-20min', 'WT_GLU-40min'], dtype=object)
```

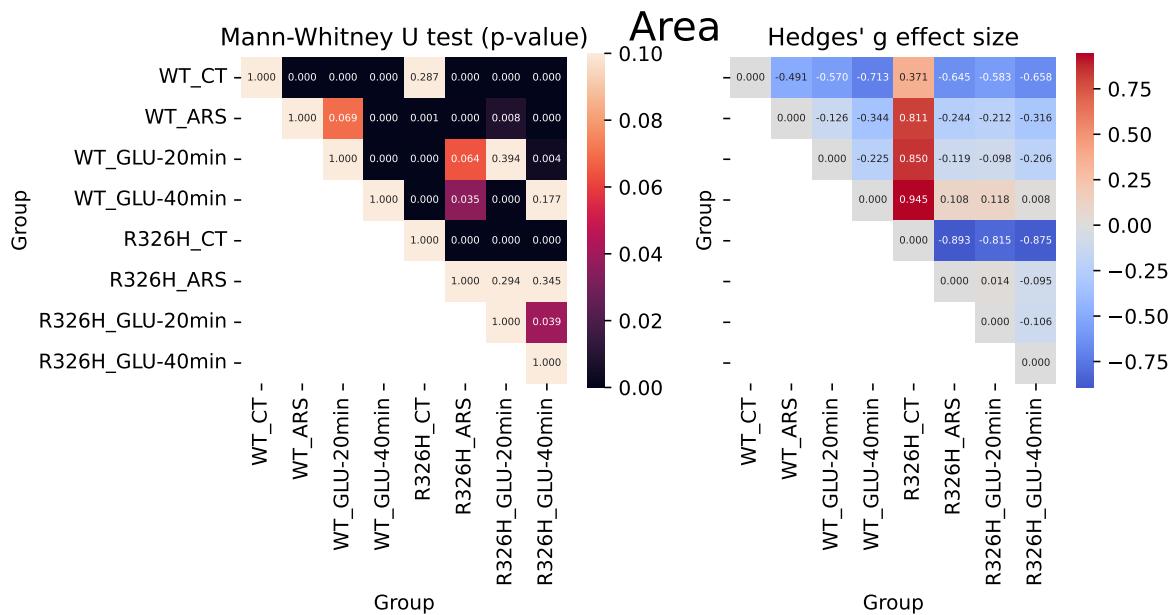
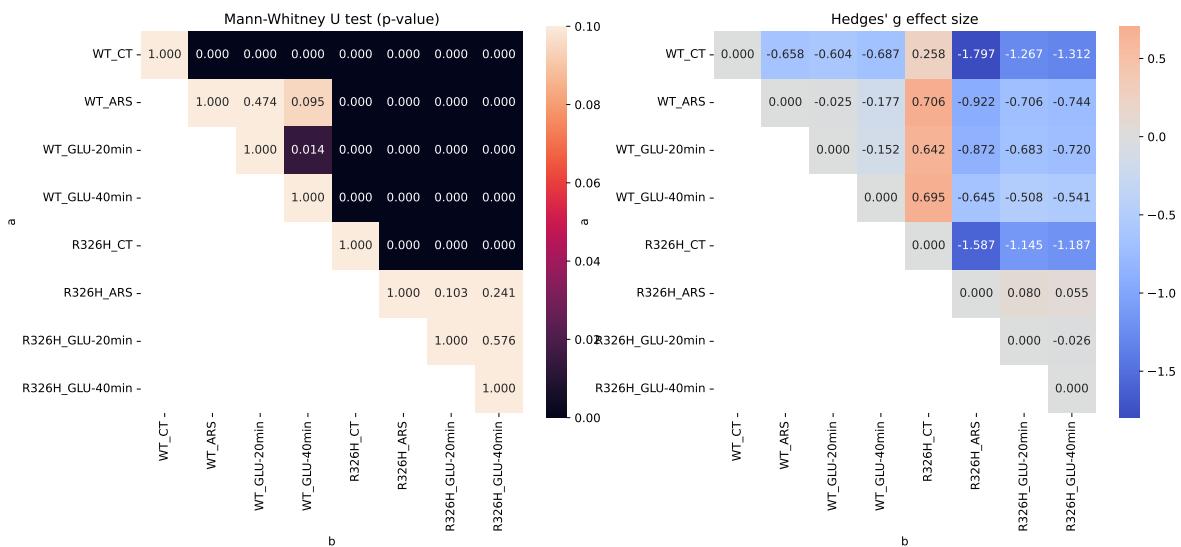
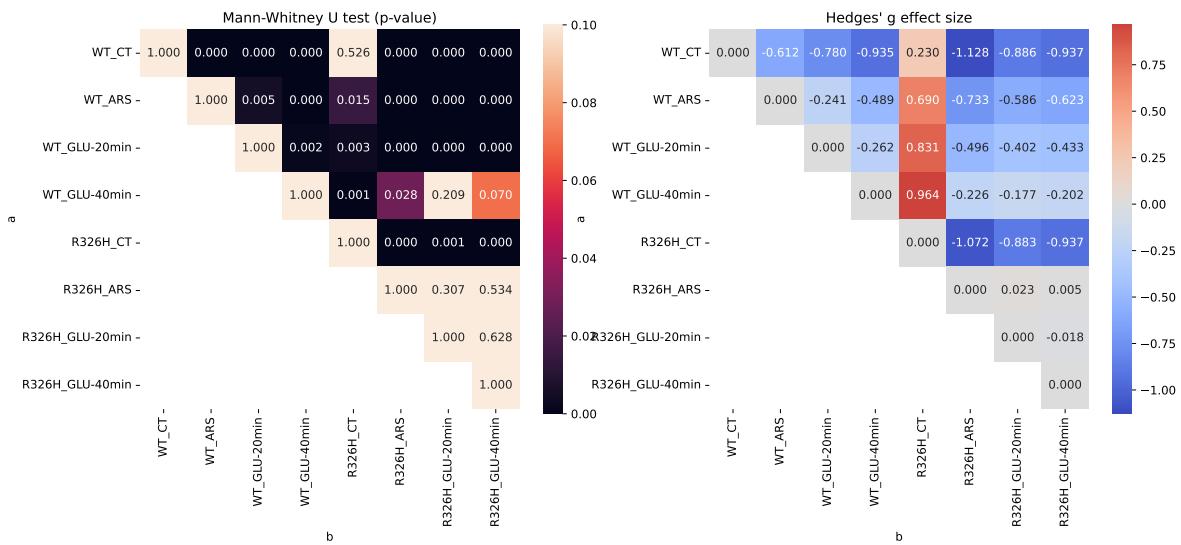


Figure 2.1: Heatmap of Mann-Whitney U test results for stress granule area

Count per cell



Count per cell (without zeros)



A Test granules segmentation

This notebook tests the granules segmentation algorithm using difference of gaussians (DoG) implemented in scikit-image filters.

```
count      876.000000
mean       1.998000
std        1.191632
min        0.486000
25%        1.101600
50%        1.782000
75%        2.600100
max        11.502000
Name: area, dtype: float64
```

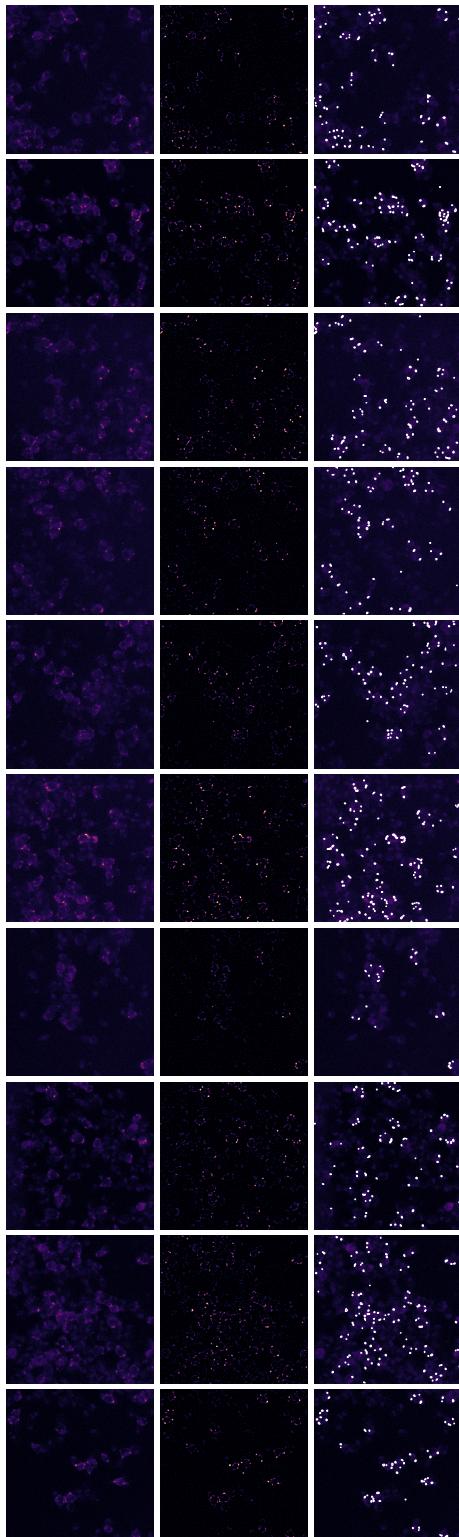
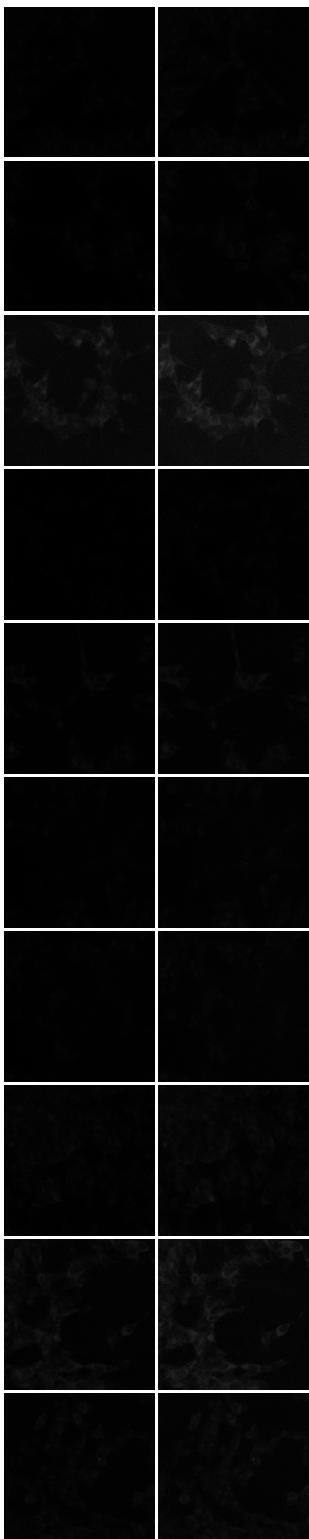
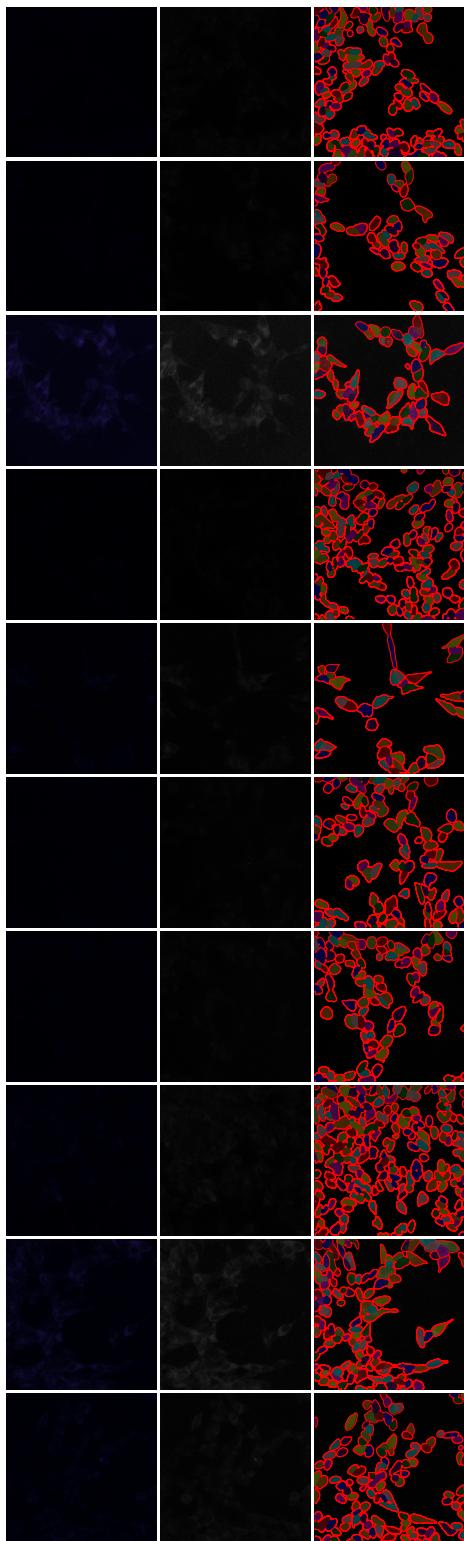


Figure A.1: Images of the cytoplasm, filtered cytoplasm and granules identified by DoG.

B Test cellpose to segment cells

This notebook tests the cellpose algorithm to segment cells. We found that the model (cyto3) worked better after a preprocessing step where we apply a gaussian filter to each channel and then rescale the intensity.





C Introduction

This is a book created from markdown and executable code.

See Knuth (1984) for additional discussion of literate programming.

D Summary

In summary, this book has no content whatsoever.

References

- Knuth, Donald E. 1984. “Literate Programming.” *Comput. J.* 27 (2): 97–111. <https://doi.org/10.1093/comjnl/27.2.97>.