#### Master Thesis

## A HASKELL WEB-APPLICATION FOR DATA-MINING COMPETITION-RESULTS FROM STAR-EXEC

A thesis submitted to attain the degree of Master of Science of HTWK Leipzig, University of applied Sciences (M.Sc. HTWK Leipzig)

#### presented by

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## Summary

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## Acknowledgements

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# 1 Introduction

## 2

## The Paper

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The project was initiated, conceived, and directed by P.M. The majority of experiments and data analysis were carried out by **C.H.T.**. Data interpretation was carried out by **C.H.T.** and P.M with contribution of the other authors. P.M wrote the manuscript with contributions from **C.H.T.** 

#### **Abstract**

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#### Introduction

Introduction goes here

#### Results

#### First result

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#### Third result

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Figure 2.2: This figure is about Y (A) First subfigure. (B) Second subfigure.

#### Discussion

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#### **Methods**

Cell culture, siRNA and drug treatments

Immunofluorescence

Live-cell imaging

**Statistical Methods** 

#### Acknowledgements

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In case you want to have separate references, as in my case, I copied over the text from my submitted manuscript and i did not want to rewrite all the citations!

#### References

- 1. Kaltschmidt, J. A., Davidson, C. M., Brown, N. H. & Brand, A. H. Rotation and asymmetry of the mitotic spindle direct asymmetric cell division in the developing central nervous system. Nat Cell Biol 2, 7–12 (2000).
- 2. Schneider, S. Q. & Bowerman, B. Cell polarity and the cytoskeleton in the Caenorhabditis elegans zygote. Annu. Rev. Genet. 37, 221–249 (2003).
- 3. Nicklas, R. B. & Arana, P. Evolution and the meaning of metaphase. J Cell Sci 102 (Pt 4), 681–690 (1992).
- 4. Goshima, G. & Scholey, J. M. Control of mitotic spindle length. Annu Rev Cell Dev Biol 26, 21–57 (2010).
- 5. Khodjakov, A. L. & Pines, J. Centromere tension: a divisive issue. Nat Cell Biol 12, 919 (2010).
- 6. Li, X. & Nicklas, R. B. Mitotic forces control a cell-cycle checkpoint. Nature 373, 630–632 (1995).
- 7. Kiyomitsu, T. & Cheeseman, I. M. Chromosome- and spindle-pole-derived signals generate an intrinsic code for spindle position and orientation. Nat Cell Biol 14, 311–317 (2012).
- 8. Kiyomitsu, T. & Cheeseman, I. M. Cortical Dynein and asymmetric membrane elongation coordinately position the spindle in anaphase. Cell 154, 391–402 (2013).
- 9. Collins, E. S., Balchand, S. K., Faraci, J. L., Wadsworth, P. & Lee, W.-L. Cell cycle-regulated cortical dynein/dynactin promotes symmetric cell division by differential pole motion in anaphase. Mol Biol Cell 23, 3380–3390 (2012).
- 10. Sluder, G., Thompson, E. A., Miller, F. J., Hayes, J. & Rieder, C. L. The checkpoint control for anaphase onset does not monitor excess numbers of spindle poles or bipolar spindle symmetry. J Cell Sci 110 ( Pt 4), 421–429 (1997).
- 11. Yang, Z., Loncarek, J., Khodjakov, A. L. & Rieder, C. L. Extra centrosomes and/or chromosomes prolong mitosis in human cells. Nat Cell Biol 10, 748–751 (2008).
- 12. Jaqaman, K. et al. Kinetochore alignment within the metaphase plate is regulated by centromere stiffness and microtubule depolymerases. J Cell Biol 188, 665–679 (2010).

- 13. Greenan, G. et al. Centrosome size sets mitotic spindle length in Caenorhabditis elegans embryos. Curr Biol 20, 353–358 (2010).
- 14. Keller, L. C., Wemmer, K. A. & Marshall, W. F. Influence of centriole number on mitotic spindle length and symmetry. Cytoskeleton (Hoboken) 67, 504–518 (2010).
- 15. Leidel, S., Delattre, M., Cerutti, L., Baumer, K. & Gönczy, P. SAS-6 defines a protein family required for centrosome duplication in C. elegans and in human cells. Nat Cell Biol 7, 115–125 (2005).
- 16. Vladimirou, E. et al. Nonautonomous movement of chromosomes in mitosis. Dev Cell 27, 60–71 (2013).
- 17. Nigg, E. A. & Raff, J. W. Centrioles, centrosomes, and cilia in health and disease. Cell 139, 663–678 (2009).
- 18. Kuo, T.-C. et al. Midbody accumulation through evasion of autophagy contributes to cellular reprogramming and tumorigenicity. Nat Cell Biol 13, 1214–1223 (2011).
- Maresca, T. J. & Salmon, E. D. Intrakinetochore stretch is associated with changes in kinetochore phosphorylation and spindle assembly checkpoint activity. J Cell Biol 184, 373–381 (2009).
- 20. Uchida, K. S. K. et al. Kinetochore stretching inactivates the spindle assembly checkpoint. J Cell Biol 184, 383–390 (2009).
- 21. Wan, X. et al. Protein architecture of the human kinetochore microtubule attachment site. Cell 137, 672–684 (2009).
- 22. Kwiatkowski, N. et al. Small-molecule kinase inhibitors provide insight into Mps1 cell cycle function. Nat Chem Biol 6, 359–368 (2010).
- 23. Rieder, C. L., Davison, E. A., Jensen, L. C., Cassimeris, L. & Salmon, E. D. Oscillatory movements of monooriented chromosomes and their position relative to the spindle pole result from the ejection properties of the aster and half-spindle. J Cell Biol 103, 581–591 (1986).
- 24. Wandke, C. et al. Human chromokinesins promote chromosome congression and spindle microtubule dynamics during mitosis. J Cell Biol 198, 847–863 (2012).
- 25. Mayer, T. U. et al. Small molecule inhibitor of mitotic spindle bipolarity identified in a phenotype-based screen. Science 286, 971–974 (1999).
- 26. Mogensen, M. M., Malik, A., Piel, M., Bouckson-Castaing, V. & Bornens, M. Microtubule minus-end anchorage at centrosomal and non-centrosomal sites: the role of ninein. J Cell Sci 113 (Pt 17), 3013–3023 (2000).

- 27. Jeffery, J. M., Urquhart, A. J., Subramaniam, V. N., Parton, R. G. & Khanna, K. K. Centrobin regulates the assembly of functional mitotic spindles. Oncogene 29, 2649–2658 (2010).
- 28. Zou, C. et al. Centrobin: a novel daughter centriole-associated protein that is required for centriole duplication. J Cell Biol 171, 437–445 (2005).
- Salmon, E. D. & Begg, D. A. Functional implications of cold-stable microtubules in kinetochore fibers of insect spermatocytes during anaphase. J Cell Biol 85, 853–865 (1980).
- 30. Rieder, C. L. The formation, structure, and composition of the mammalian kineto-chore and kinetochore fiber. Int Rev Cytol 79, 1–58 (1982).
- 31. Schmidt, J. C. et al. Aurora B kinase controls the targeting of the Astrin-SKAP complex to bioriented kinetochores. J Cell Biol 191, 269–280 (2010).
- 32. Ganem, N. J. & Compton, D. A. The KinI kinesin Kif2a is required for bipolar spindle assembly through a functional relationship with MCAK. J Cell Biol 166, 473–478 (2004).
- 33. Ganem, N. J., Upton, K. & Compton, D. A. Efficient mitosis in human cells lacking poleward microtubule flux. Curr Biol 15, 1827–1832 (2005).
- 34. Kapoor, T. M., Mayer, T. U., Coughlin, M. L. & Mitchison, T. J. Probing spindle assembly mechanisms with monastrol, a small molecule inhibitor of the mitotic kinesin, Eg5. J Cell Biol 150, 975–988 (2000).
- 35. Wang, W.-J., Soni, R. K., Uryu, K. & Tsou, M.-F. B. The conversion of centrioles to centrosomes: essential coupling of duplication with segregation. J Cell Biol 193, 727–739 (2011).
- 36. Rieder, C. L. & Borisy, G. G. The Centrosome Cycle in PtK2 Cells: Asymmetric distribution and structural changes in the pericentriolar material. Biol Cell 44, 117–132 (1982).
- 37. Pereira, A. J. & Maiato, H. Maturation of the kinetochore-microtubule interface and the meaning of metaphase. Chromosome Res 20, 563–577 (2012).
- 38. Meraldi, P., Draviam, V. M. & Sorger, P. K. Timing and checkpoints in the regulation of mitotic progression. Dev Cell 7, 45–60 (2004).
- 39. Dick, A. E. & Gerlich, D. W. Kinetic framework of spindle assembly checkpoint signalling. Nat Cell Biol 15, 1370–1377 (2013).

- 40. Collin, P., Nashchekina, O., Walker, R. & Pines, J. The spindle assembly checkpoint works like a rheostat rather than a toggle switch. Nat Cell Biol 15, 1378–1385 (2013).
- 41. Rappaport, R. Experiments concerning the cleavage stimulus in sand dollar eggs. J. Exp. Zool. 148, 81–89 (1961).
- 42. Bringmann, H. & Hyman, A. A. A cytokinesis furrow is positioned by two consecutive signals. Nature 436, 731–734 (2005).
- 43. Dechant, R. & Glotzer, M. Centrosome separation and central spindle assembly act in redundant pathways that regulate microtubule density and trigger cleavage furrow formation. Dev Cell 4, 333–344 (2003).
- 44. Mchedlishvili, N. et al. Kinetochores accelerate centrosome separation to ensure faithful chromosome segregation. J Cell Sci 125, 906–918 (2012).
- 45. McClelland, S. E. et al. The CENP-A NAC/CAD kinetochore complex controls chromosome congression and spindle bipolarity. EMBO J 26, 5033–5047 (2007).

# Second chapter

#### More results

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### General Discussion

Write your awesome discussion here!

## A

## Appendix topics

### References