

## **Abstract**

Accurate chromosome segregation in zygotes is crucial for further successful development of an embryo. Mouse strains may differ in their preimplantation development success rate. In mice, during their first mitosis, two spindles assemble around each set of parental chromosomes, eventually forming a single mitotic spindle. This thesis is focused on the comparison of spindle formation in zygotes with both parents from the CD-1 strain and hybrid zygotes created by crossing B6D2F1/JRccHsd males with CD-1 females. Confocal time lapse imaging and vital dyes visualizing DNA and tubulin allowed for real time spindle assembly tracking. Localization and signal intensity of the protein Mad2 were assessed in interphase of the first embryonic division after fertilization using immunodetection with a specific antibody. The data obtained from time lapse imaging and Mad2 immunodetection revealed that in selected parameters hybrid zygotes created by crossing B6D2F1/JRccHsd males with CD-1 females and zygotes with both parents from the CD-1 strain exhibit similar behavior.

**Keywords:** time lapse imaging, mouse strains, spindle, chromosome segregation, zygote, vital dyes