

Linz, 15. November 2020

RE: Supervisor's review for the bachelor thesis of Mehdin Masinovic

It was a pleasure to have supervised the bachelor work and thesis of Mehdin Masinovic with the title "Short tandem repeat analysis (*STRAH*) in recombination hotspots across the human genome". For his thesis Mehdin implemented a bioinformatics package (*STRAH*) that searches certain sequence motifs in the genome enclosed within defined genome coordinates, published previously in Heissl et al LSA. 2019.

Mehdin first evaluated the performance of *STRAH* in a simulated data set that he constructed with known number of repeat sequences and made important adjustments to the package based on his simulation results. Next, Mehdin evaluated the occurrence of a series of short tandem repeats (also known as microsatellites) occurring in human recombination hotspots using the genome coordinates published by Pratto et al 2014. He compared the repeat occurrence in hotspots and 5 regions flanking the hotspots, as well as the genome wide-occurrence of the repeats. He observed an enrichment of mononucleotide repeats in hotspots compared to neighboring regions, known previously only for poly-As. He also observed an enrichment of di-, some tri- and tetra-nucleotide repeats and tandem repeats. This was an extensive piece of work, given the large number of different repeat types. Mehdin also made important statistical analyses implementing diverse statistical tests to test for significance in the repeat enrichment. Future aspects of this work could be developed into comparing the fold enrichment between repeat lengths and types in hotspots compared to flanking regions. However, this is out of the scope of Mehdin's bachelor thesis.

Finally, the work was very well structured and Mehdin wrote several reports documenting the progress throughout his bachelor thesis that we discussed together also with Dr. Philipp Hermann, making the direction of his work straightforward. Also the thesis itself was well organized and written and included all the important information and analyses, as well as revisions after feedback, making his thesis a complete piece of work.

I grade this thesis as excellent and assign it the highest possible grade of "one".



Irene Tiemann-Boege