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Computational, biochemical, and NMR-driven structural studies on histone variant H2A.B

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The research described in this thesis was performed in the Macromolecular Biochemistry Department of the Leiden Institute of Chemistry in Leiden, the Netherlands and the NMR Spectroscopy Research Group of the Bijvoet Center for Biomolecular Research in Utrecht, the Netherlands.

To my grandfather (1928-2018)

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Abbreviations

| | |
|----------|---|
| AEP | Asparaginyl endopeptidases |
| AFM | Atomic force microscopy |
| AP | Acidic patch |
| ATP | Adenosine triphosphate |
| Bp | Base pairs |
| BME | β -mercapto-ethanol |
| BMRB | Biological magnetic resonance data bank |
| CHES | N-Cyclohexyl-2-aminoethanesulfonic acid |
| ChIP | Chromatin immunoprecipitation |
| ChIP-seq | ChIP sequencing |
| CPMG | Carr-Purcell-Meiboom-Gill sequence |
| CS | Chemical shift |
| CSI | Chemical shift indices |
| CSP | Chemical shift perturbation |
| DNA | Deoxyribonucleic acid |
| DTT | Dithiothreitol |
| EDTA | Ethylenediaminetetraacetic acid |
| EPL | Expressed protein ligation |
| FRET | Fluorescence resonance energy transfer |
| GFP | Green fluorescent protein |
| HAC | Acetic acid |
| HDAC | Histone deacetylase |
| HSQC | Heteronuclear single quantum coherence spectroscopy |
| IPTG | Isopropyl β -D-1-thiogalactopyranosid |
| LB | Lysogeny broth |
| LEGO | Label, express and generate oligomers |
| MD | Molecular dynamics |
| MES | 2-ethanesulfonic acid |
| MNase | Micrococcal nuclease |
| MQ | Multiple quantum |
| mRNA | Messenger RNA |
| NCP | Nucleosome core particle |
| NMR | Nuclear magnetic resonance |
| NOE | Nuclear overhauser effect |
| NOESY | Nuclear overhauser effect spectroscopy |

| | |
|------------|---|
| NTD | N-terminal domain |
| PCR | Polymerase chain reaction |
| PDB | Protein data bank |
| Pi | Inorganic phosphate |
| PMSF | Phenylmethylsulfonyl fluoride |
| PTM | Post translational modification |
| PTS | Protein trans-splicing |
| R2 | Transverse relaxation rate |
| RMSD | Root mean square deviation |
| RNA | Ribonucleic acid |
| RNA Pol II | RNA polymerase II |
| RDC | Residual dipolar coupling |
| SAXS | Small angle X-ray scattering |
| SAIL | Stereo-array isotope libeling |
| SDS-PAGE | Sodium dodecyl sulfate polyacrylamide gel electrophoresis |
| SHL | Super helix location |
| SrtA | Sortase A |
| S/N | Signal to noise ratio |
| Tm | Melting temperature |
| TROSY | Transverse relaxation optimized spectroscopy |
| TSA | Thermal shift assay |
| tc | Rotational correlation time |
| wt | Wild type |
| Xi | Inactive X chromosome |