ETH zürich

D-HEST

Three-stage FMD diet effect on aging

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Semester Project
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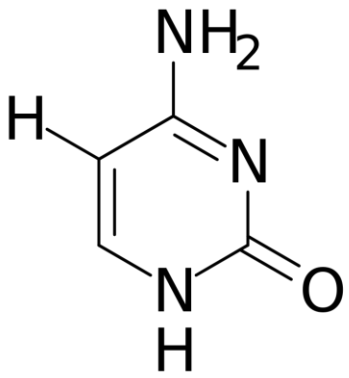
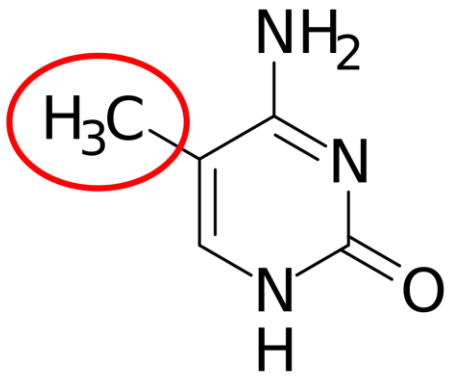
Introduction – DNA Methylation and Aging

Recent studies have shown that DNA methylation is indicative of aging and age-related diseases [1, 2, 3, 4, 5, 6].



Cytosine



Methylated Cytosine

DNA methylation inhibits gene expression in animal cells [4]. Biological aging plays a role in age-related diseases since the ratio of lymphoid-to-myeloid is associated with transcriptional upregulation of genes [6].

Milestones

1. Concept definition and literature review (3 weeks)

2. Extract CPG sites which are indicative of biological aging using the Horvath and GKM age and compare to those found in literature (2 weeks)

3. Train model dependent on lifestyle characteristics (smoking, alcohol consumption, and more) and the biomarkers found for aging in step 1 (3 weeks)

4. Examine the cofounding effects from the lifestyle-relate variables (3 weeks)

5. Compare the performance of the model found in step 2 to a model trained using only biomarkers (1 week)

6. Create a Python package that analyzes and visualizes DNA methylation and age (3 weeks)

References

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