SILICON HUMAN: OXIDATIVE STRESS MODEL FOR AGING, PARKINSON'S DISEASE AND PRECISION THERAPIES

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Systems Biology aims to understand biological emergence from the interactions of biomolecules, e.g. by integrating the knowledge about these interactions into a computer model and thereby reconstructing biological behavior in silico. In relation to the human, such an in silico replica of the whole body is the so-called Silicon Human. We can add medicine aspects to this model and, using the patient's genome, transcriptome and proteome data, parameterize a Silicon Human for any patient individually (Silicon Patient), thereby propelling individualized medicine of any systems biological disease.

As a successful example of this systems biological approach, our mechanism-based experimentally validated model enabled us to predict in silico the influence of oxidative stress and various Parkinson's disease conditions (e.g. mutations) on aging. We discuss how this Silicon Human may be used to develop personalized therapies of Parkinson's disease [1,2].

References.
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