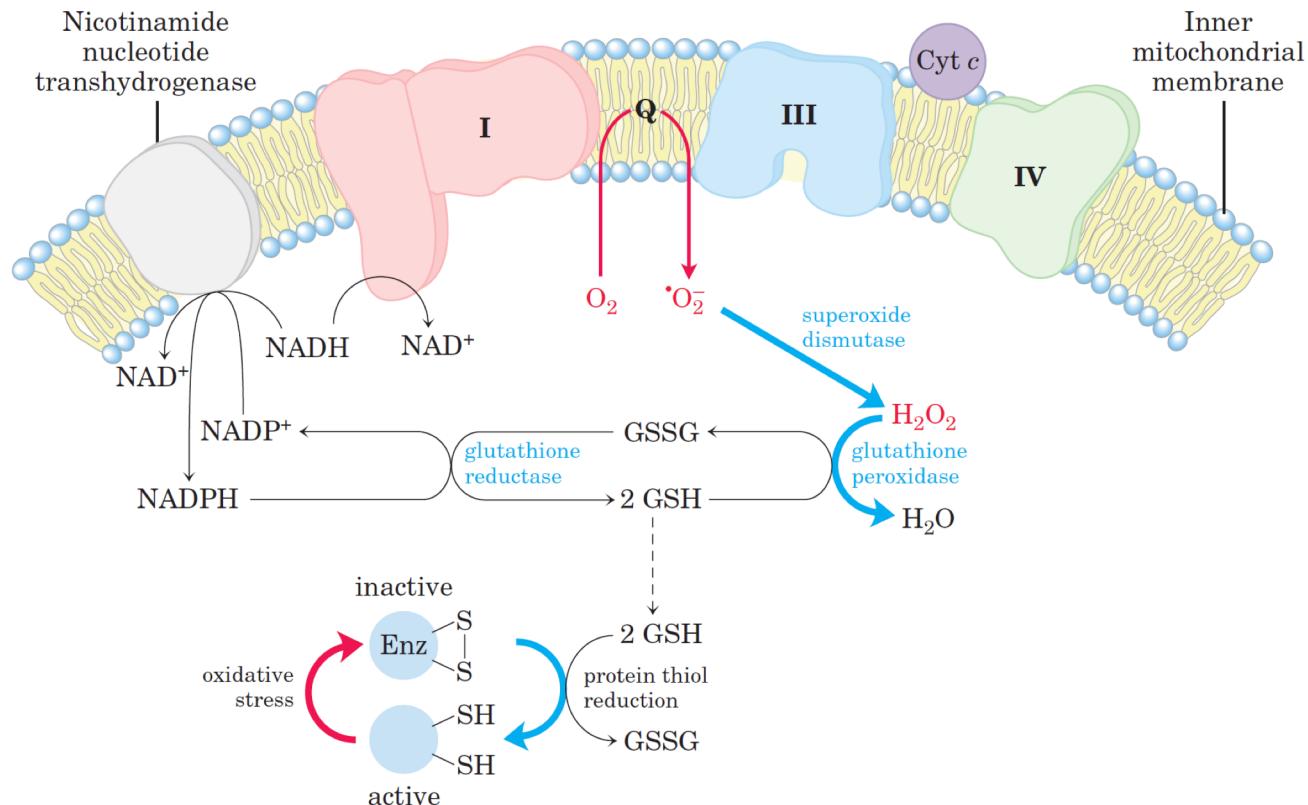


SOD2

Manganese Superoxide Dismutase

Biological / biochemical Function

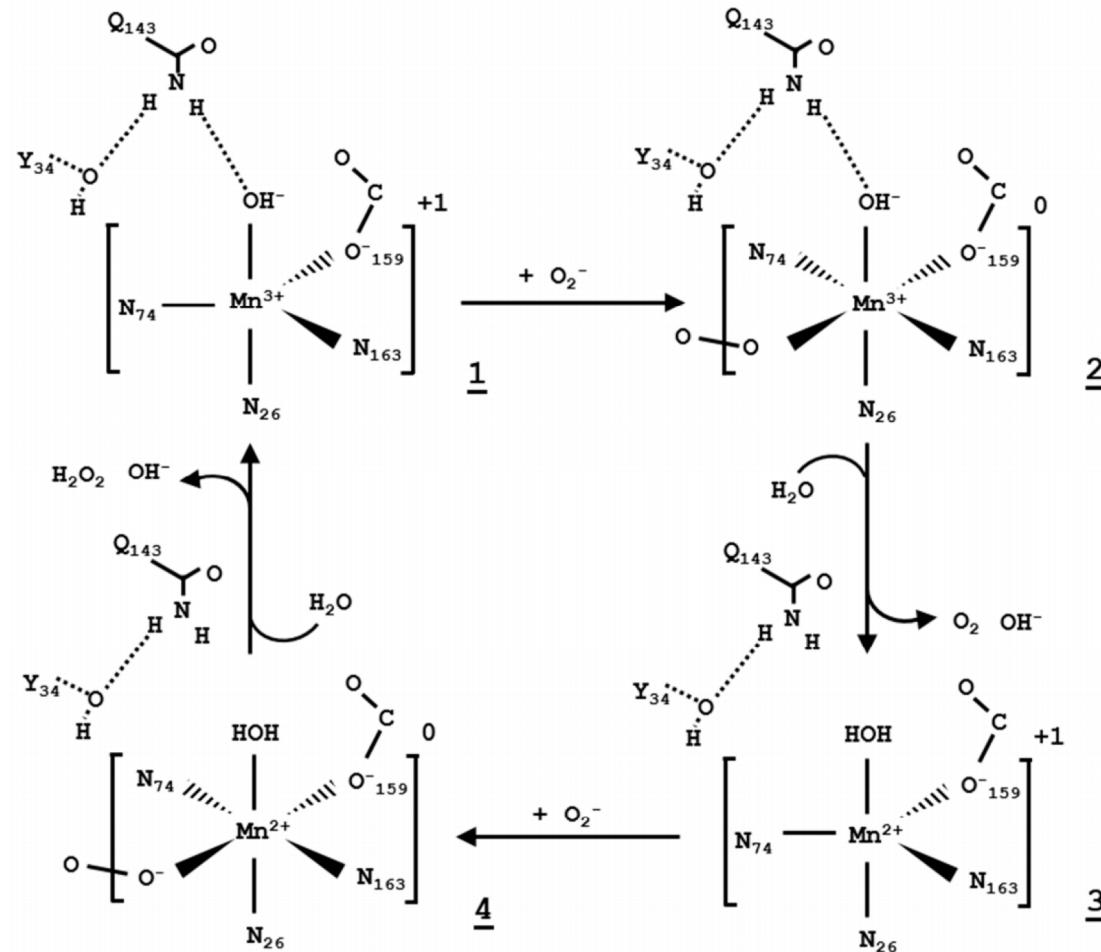
- SOD2 eliminates radicals in the mitochondria



- Reaction (disproportionation):

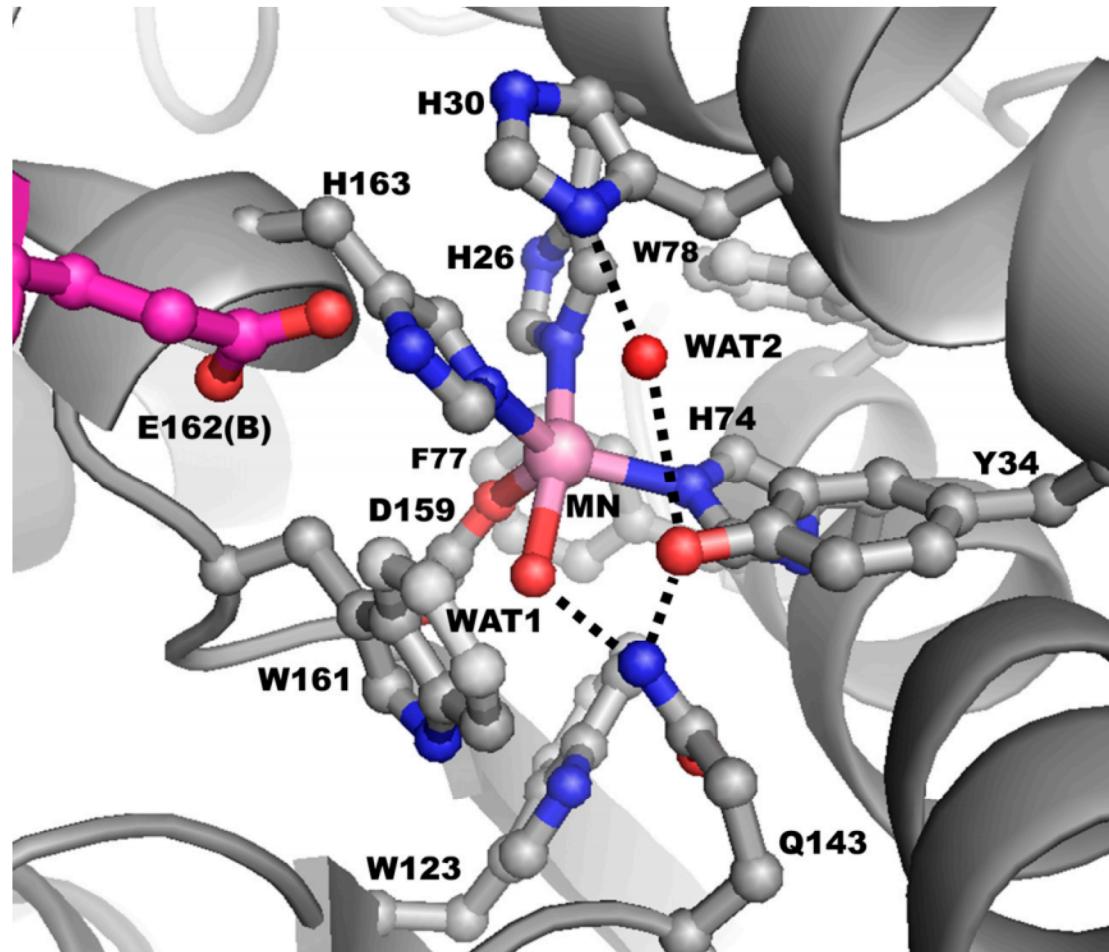


- (One possible)
reaction mechanism:



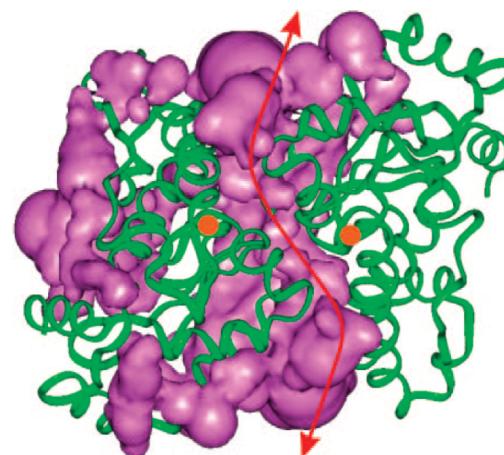
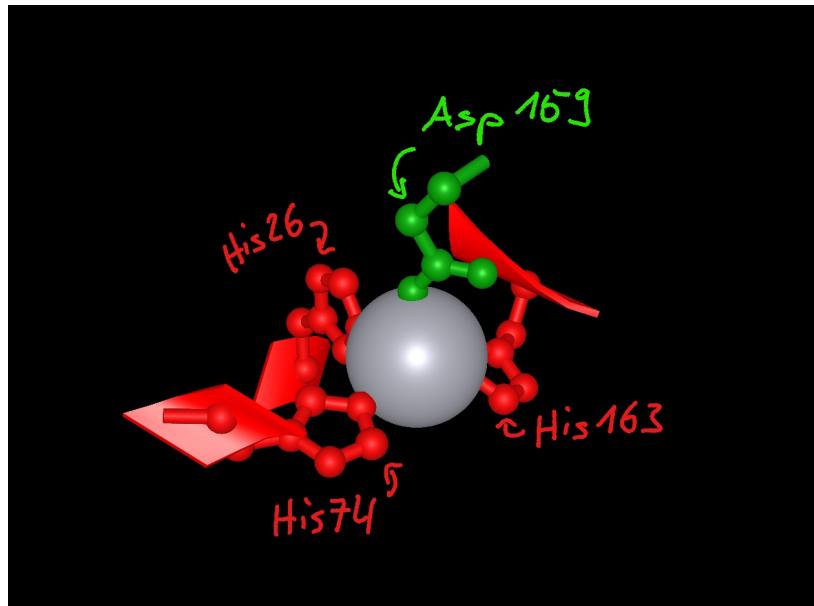
Open questions regarding the mechanism:

- Where do the protons actually come from?
- Associative for the first vs second-sphere mechanism for the second half-reaction

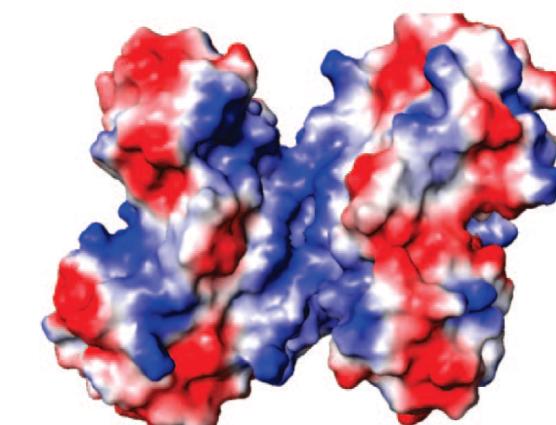


Active Site

- trigonal bipyramidal geometry (OH- ligand missing here)
- How does superoxide enter the active site?



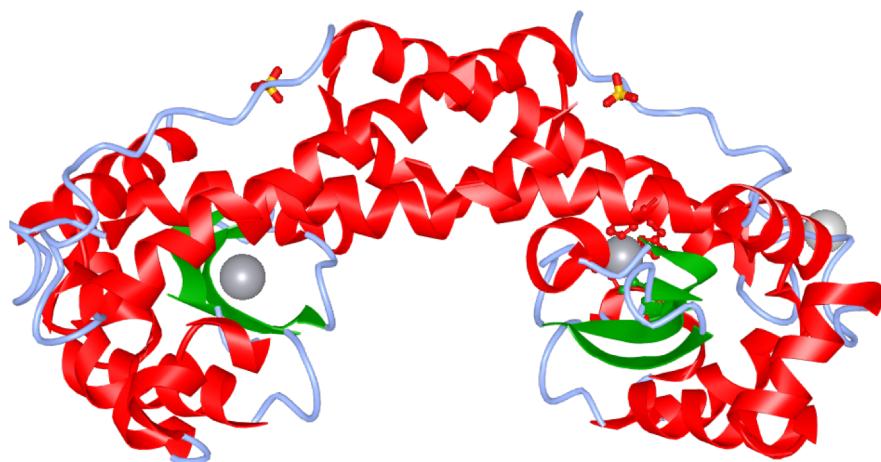
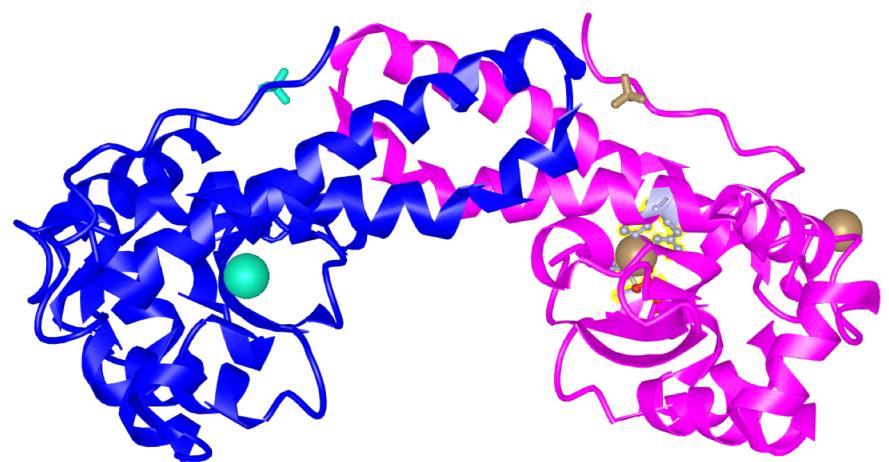
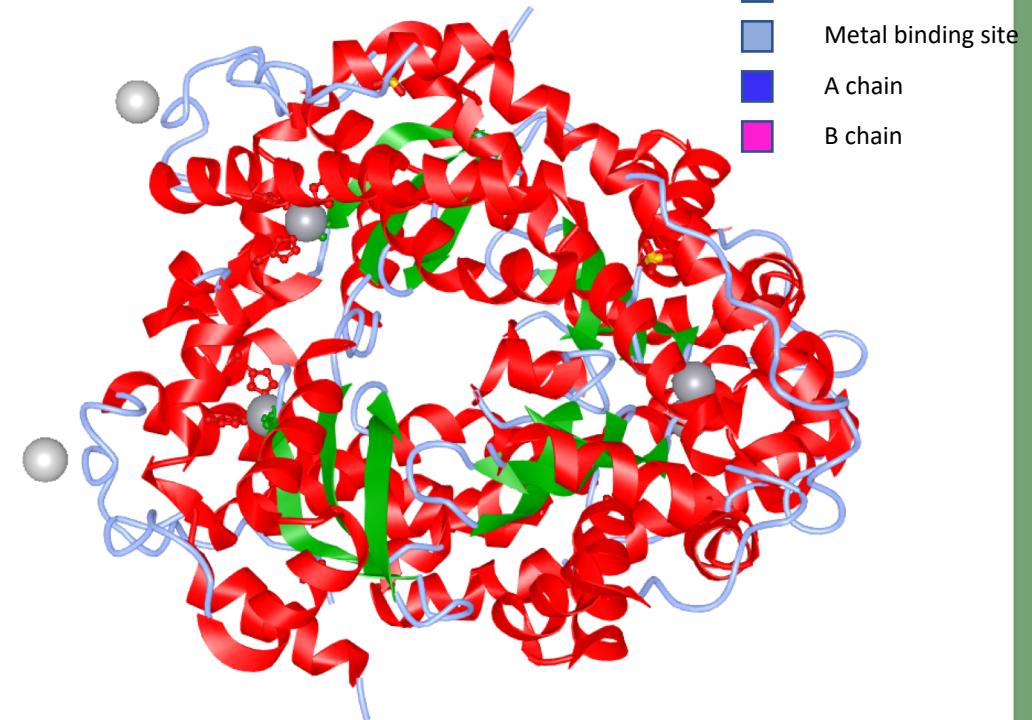
Magenta: gap regions at the dimer interface
Green: protein backbone
Ball: active site



Blue: positively charged region
Red: negatively charged region

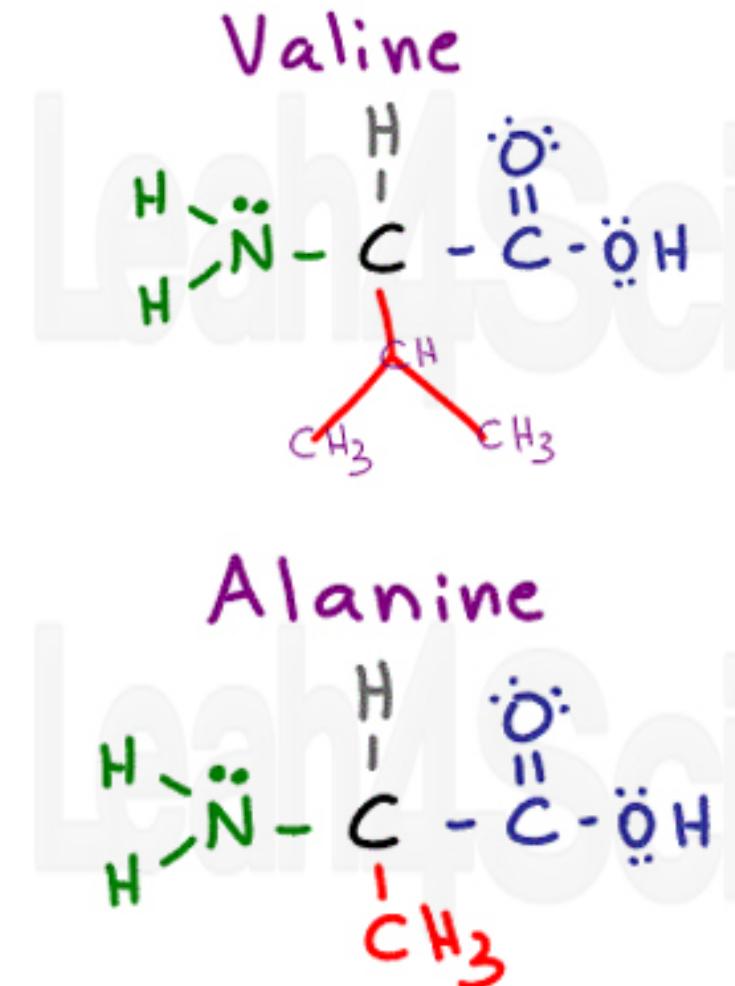
Structure

- Metal binding sites
- Homo-tetramer
- Gene located on chromosome 6



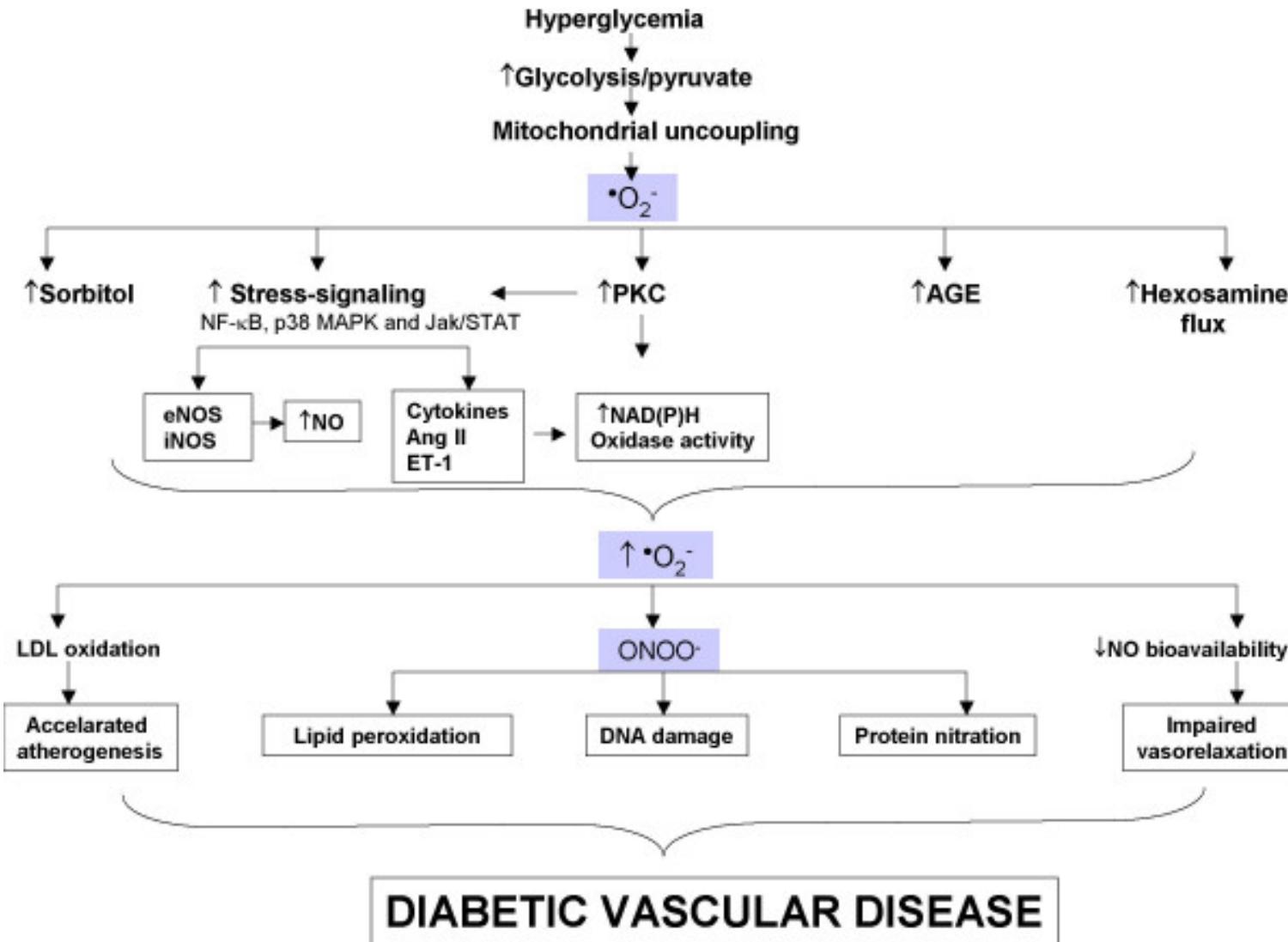
Mutant Variation

- rs4880
- Expectations
- PolyPhen-2



Diseases

- Actual influence
- Visualisation
- Disease (Diabetes)
 - The role of ROS in cardiovascular disease
 - The role of diabetes in production of ROS
 - The influence of variant rs4880 as shown in a small-scale study



The Heights and Lows

- Getting more confident to use the different websites as reliable sources of information and data
- Using the collective information from different websites to boldly, but yet carefully postulate possible explanations for arising problems during our research

Indication of source

- <https://www.uniprot.org/uniprot/P04179#function>
- <https://www.rcsb.org/structure/5VF9>
- https://www.ncbi.nlm.nih.gov/dbvar/browse/org/?taxid=9606&assm=GCF_000001405.13&chr=NC_000006.11&from=149476159.6&to=173082241.4&studies=nstd102&variant=nsv4436131
- <https://www.ebi.ac.uk/thornton-srv/databases/cgi-bin/pdbsum/GetPage.pl?pdbcode=5VF9>
- http://www.ensembl.org/Homo_sapiens/Variation/Explore?db=core;r=6:159692340-159693340;v=rs4880;vdb=variation;vf=306997068
- <http://genetics.bwh.harvard.edu/pph2/>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2386118/>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1131912/>
- https://en.wikipedia.org/wiki/Target_peptide#Mitochondria_and_plastid
- <https://pubs.acs.org/doi/10.1021/jp810247u>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5836015/pdf/antioxidants-07-00025.pdf>
- Lehninger, Principles of Biochemistry

Thanks for your attention