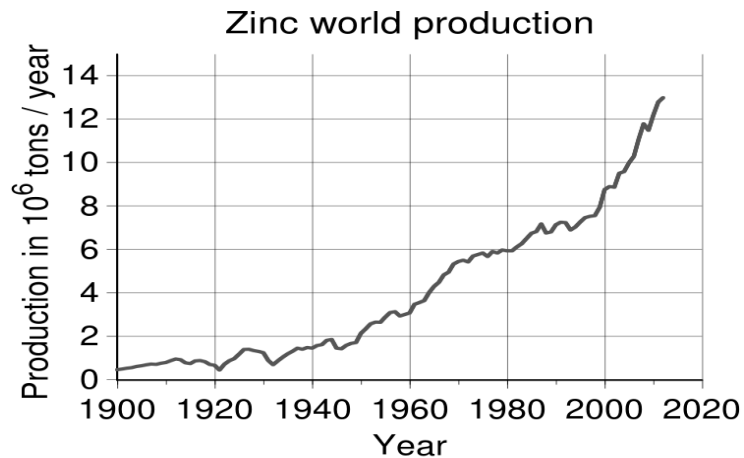


Zinc ions presence in environment

Název:

Školitel: Zbyněk Heger

Datum: 5. 6. 2014



Reg.č.projektu: CZ.1.07/2.3.00/20.0148

Název projektu: Mezinárodní spolupráce v oblasti "in vivo" zobrazovacích technik



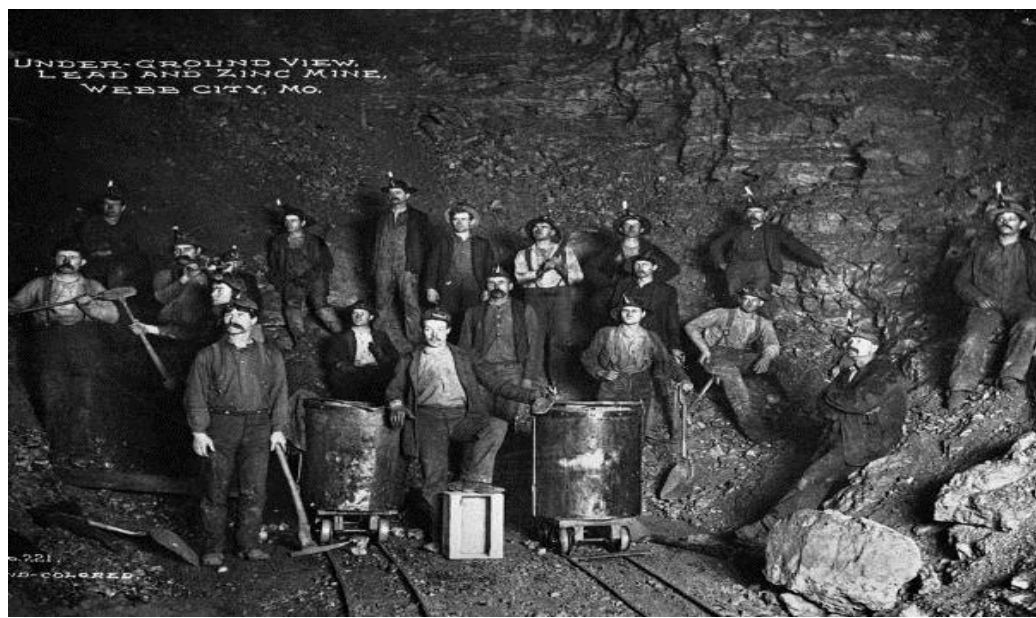
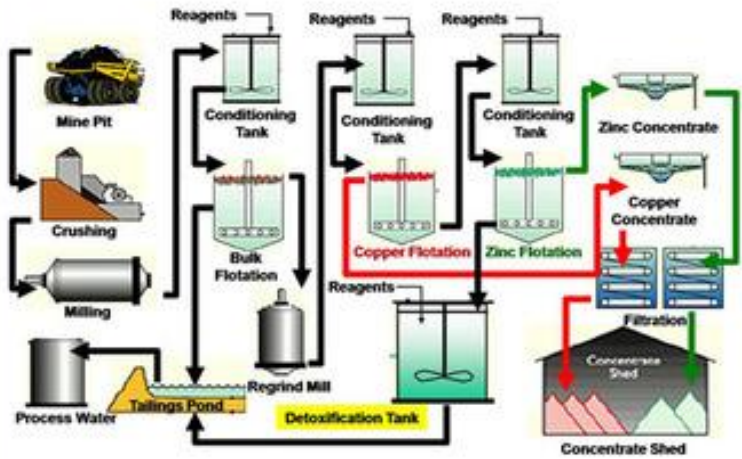
Zinc



- Zn, atomic number 30.
- Very similar to Mg - ion of similar size and oxidation state +2.
- The 24th most abundant element in the Earth's crust.
- Sphalerite - Australia, Asia, USA.



PROCESS OPERATION

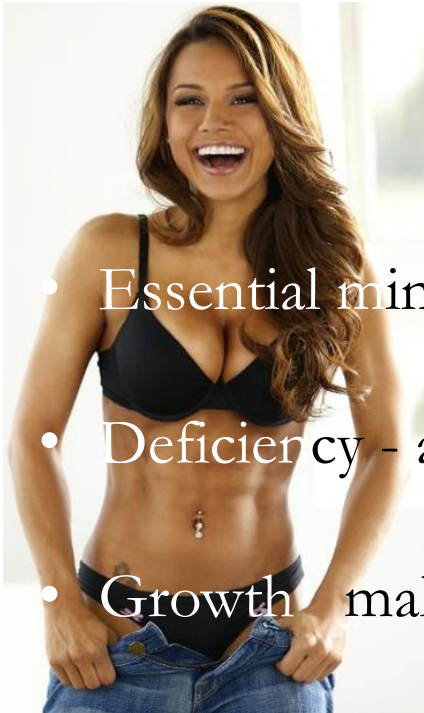


Red Dog creek, Alaska

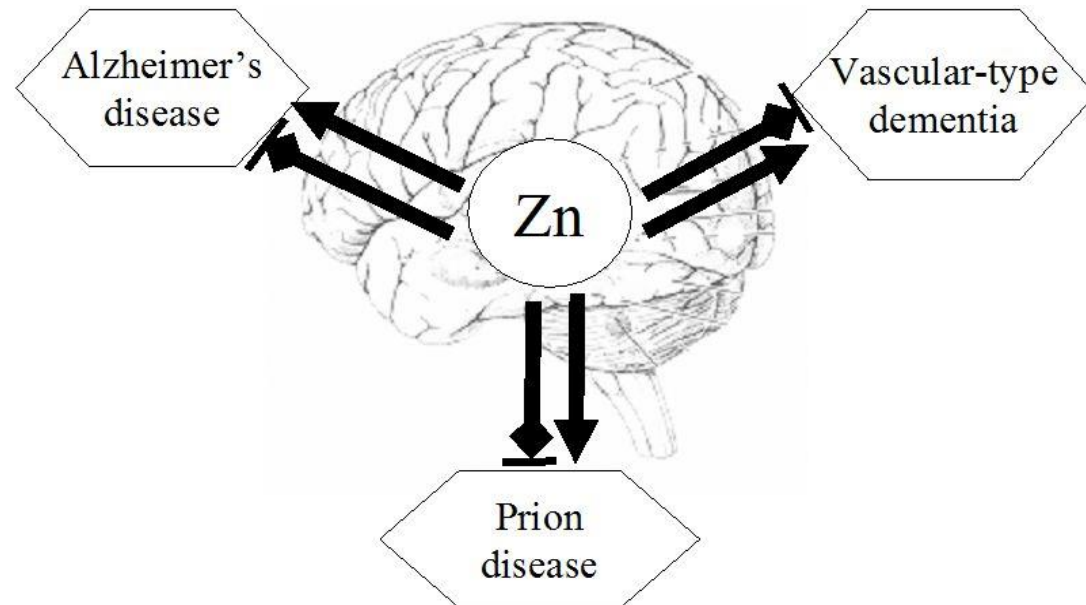


Spilpunt, Nevada

Zinc in biology

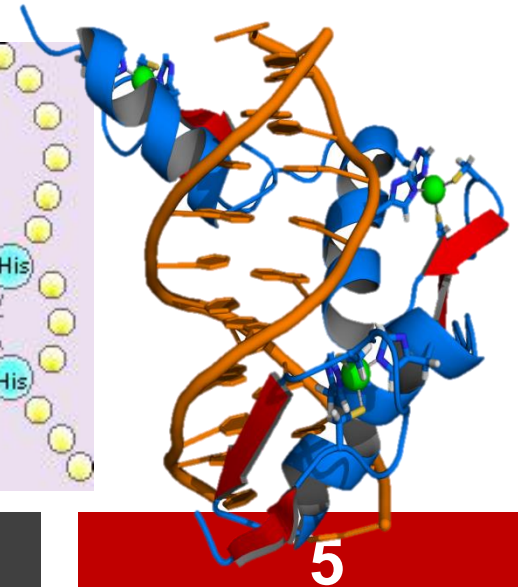
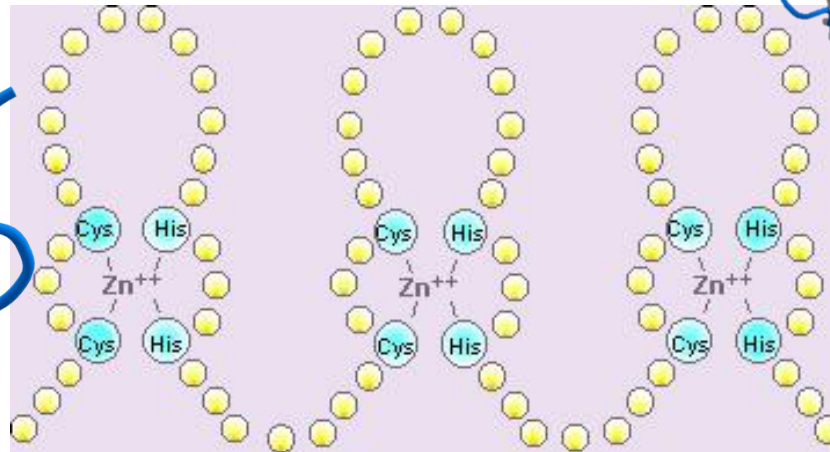
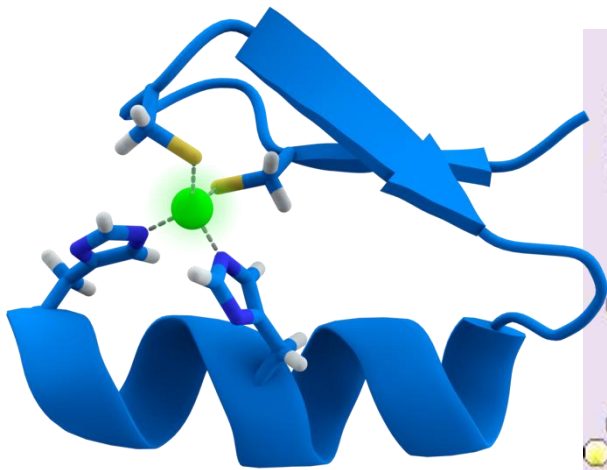
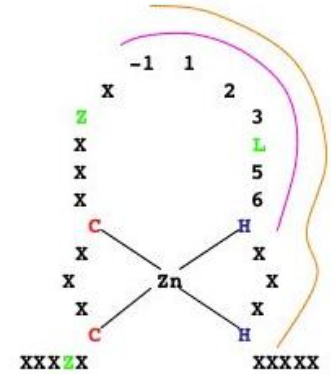


- Essential mineral - exceptional for biologic and public health.
- Deficiency - about two billion people.
- Growth malformation, delayed sexual maturation, infection susceptibility.
- Zn atom-based enzymes - e.g. alcohol dehydrogenase.



Zinc finger

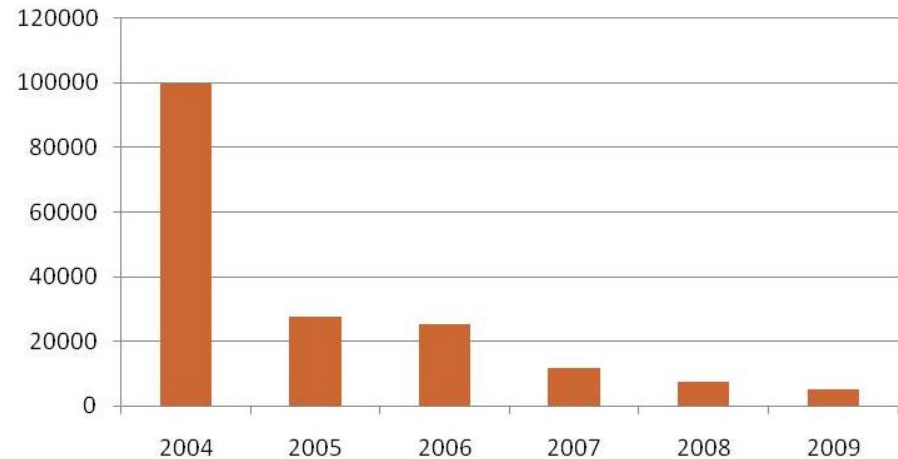
- Protein structural motif – coordination of zinc ions, stabilizing folds.
- Over 700 ZnF proteins in human genome.
- Protein/DNA bond – transcription factors.
- Alpha helix – beta sheet – Zn binding site, stabilized by Y, F, L.



Zinc in environment

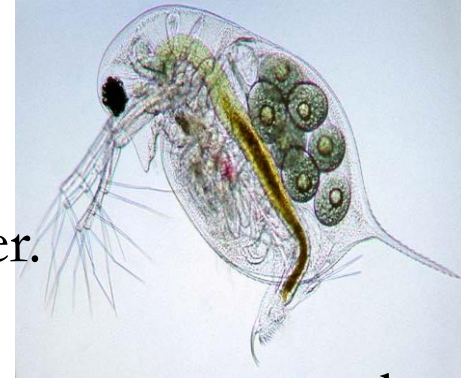
- Anthropogenic origin.
- Combustion of fossil fuels.
- Mining and ore processing.
- Industrial waste water (non-ferrous ores or metal finishing).
- Fertilizers containing zinc.

Lovochemie - úniky zinku do vody v kg/rok podle IRZ

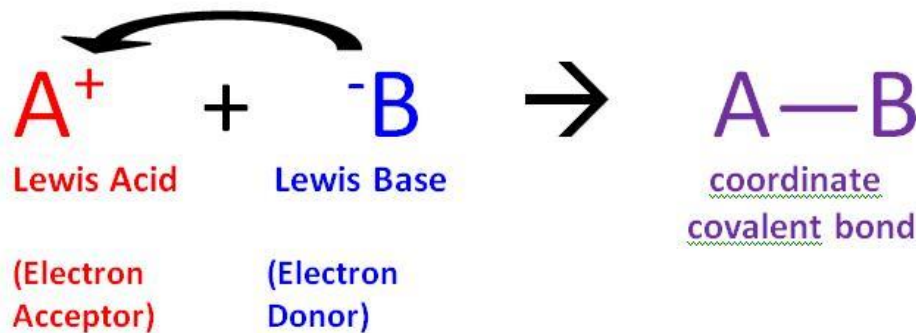


Toxicity

- The free zinc ions – highly toxic.
- 6 μM of free Zn ions kills 93 % of all *Daphnia* in water.
- Powerful Lewis acid - ingested zinc - HCl - ZnCl - damage to stomach.
- Alterations of blood lipoprotein levels – increased LDL, decreased



HDL.

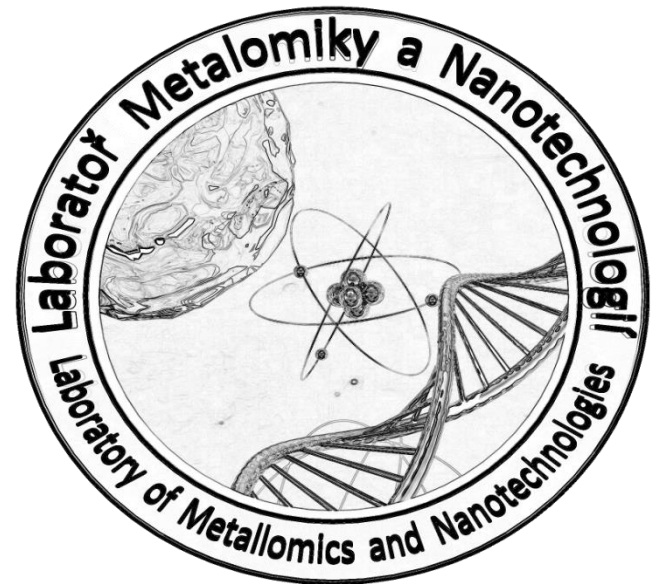


Acknowledgements



Mezinárodní spolupráce v oblasti
"in vivo" zobrazovacích technik

CZ.1.07/2.3.00/20.0148



**Thank you for your
attention**

