

Název: METALLOTHIONEIN Levels in PATIENTS
WITH MALIGNANT TUMOUR

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Datum: 5.2.2013

Metallothionein

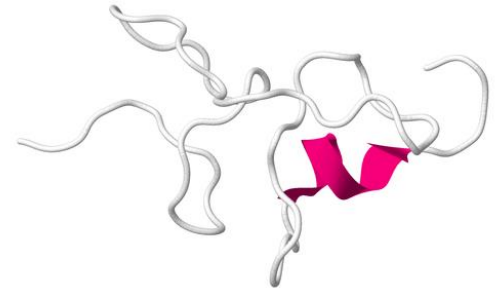
Properties

- isolated in 1957 by Margosh and Vale from horse kidney
- low molecular protein (6-10 kDa)
- cystein rich protein
- no aromatic aminoacides

Functions

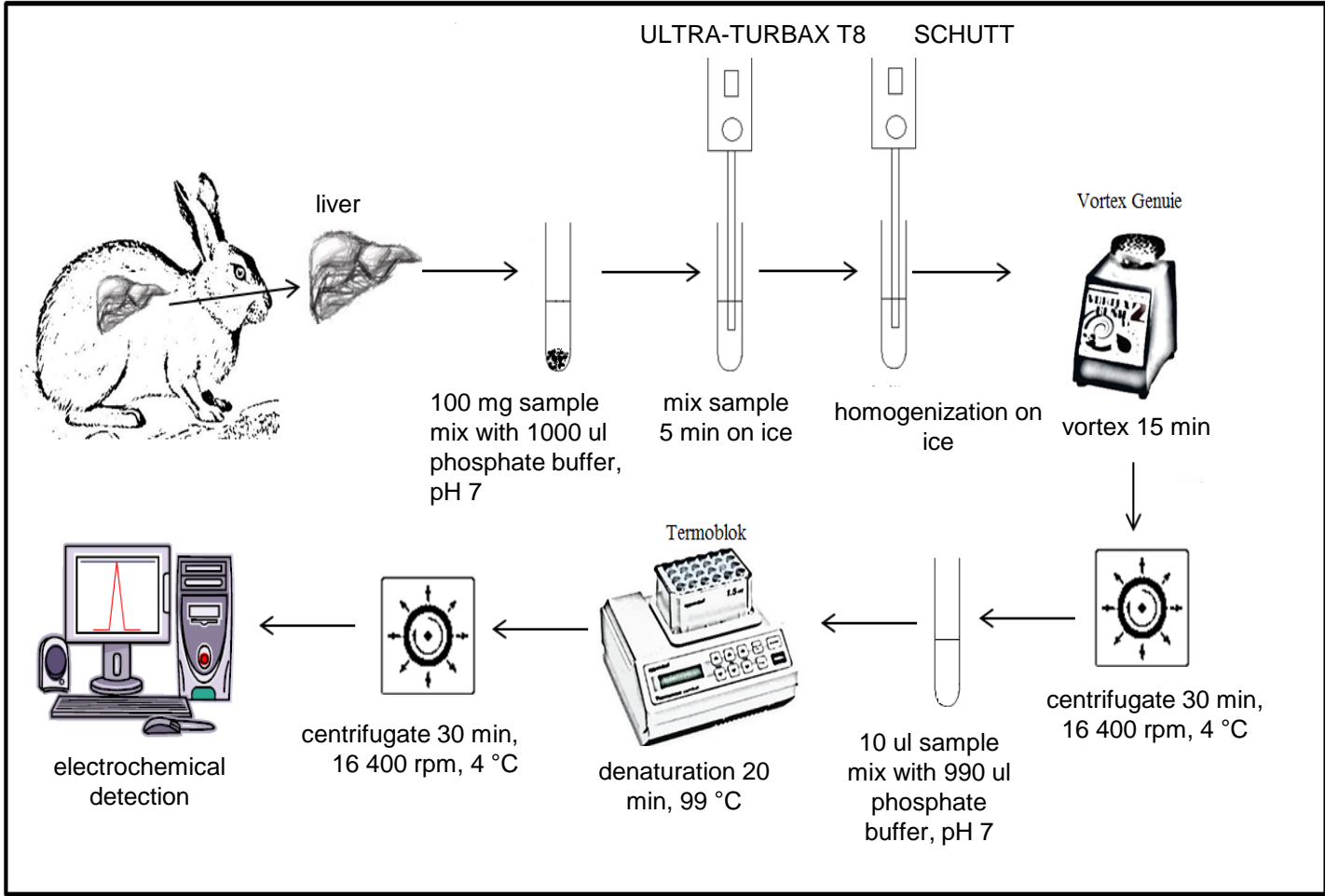
- protection to heavy metals
- antioxidant
- bounding of heavy metals (Cd, Hg, Pb) after intoxication of organism and by this way heavy metals are „destroyed“
- conservation of oxidative-reduction conditions
- metal ions transportation
- expression regulation

- possible prognostic marker at cancer diseases



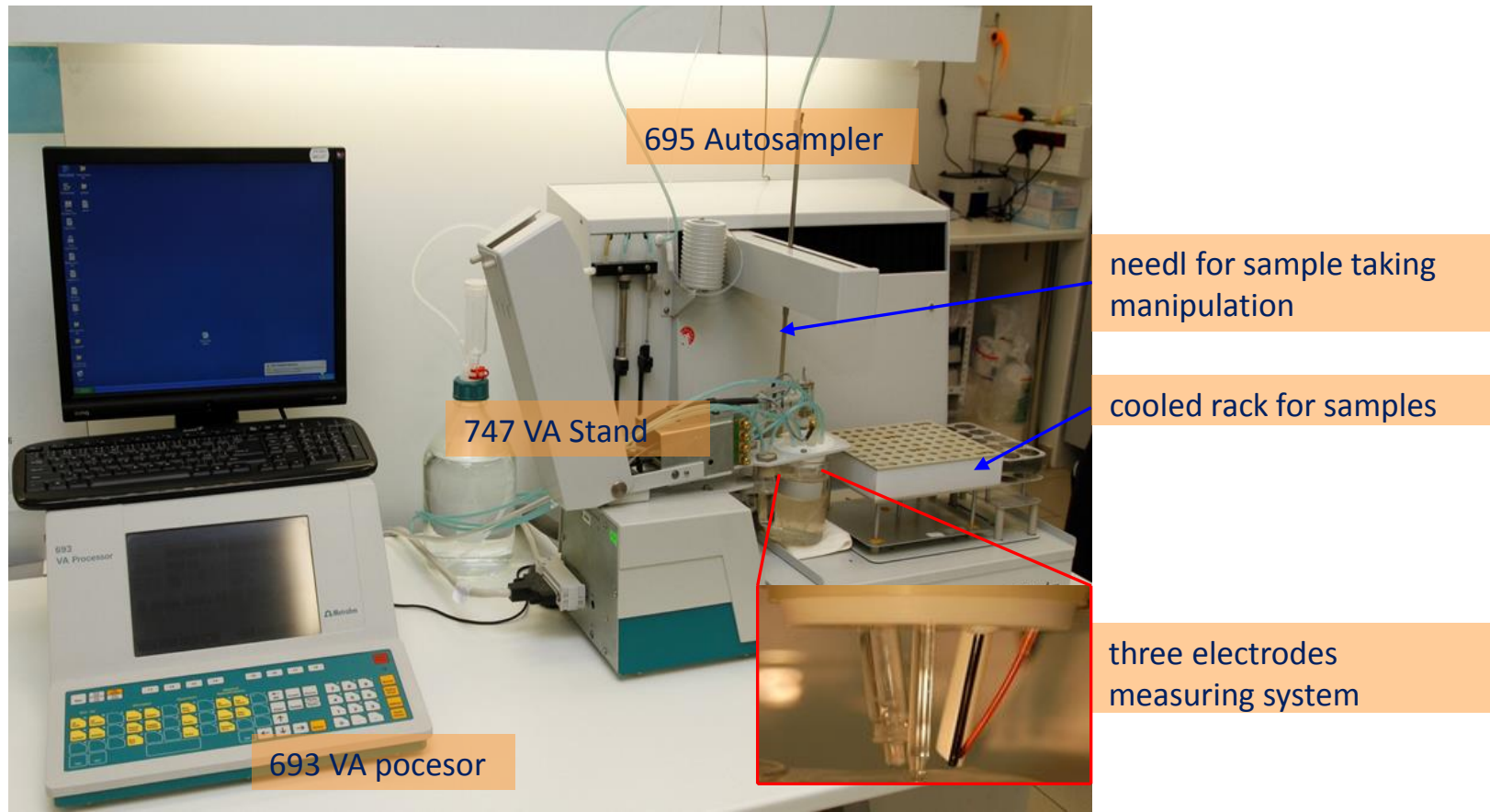
Sample preparation for metallothionein measurement

- blood
- animal sample (liver, kidney, muscle,...)



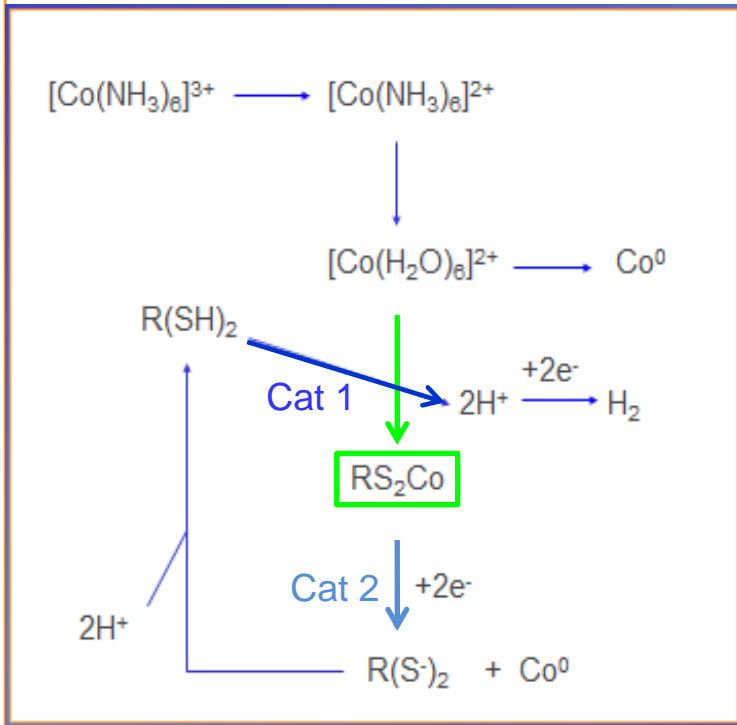
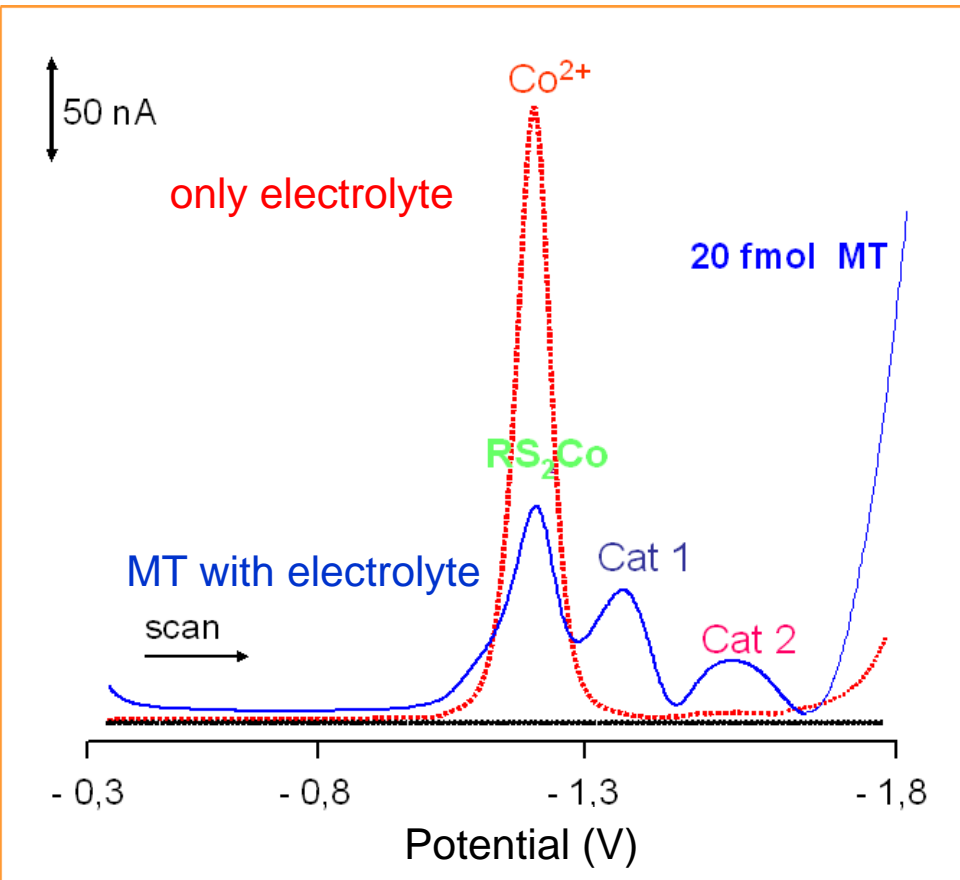
Electrochemical determination of metallothionein

- 747 VA Stand with 693 VA processor and 695 Autosampler
- three electrodes measuring system
- electrolyte: Brdička solution: 1mM $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$ and 1mM ammonium buffer (NH_3 (aq) + NH_4Cl)



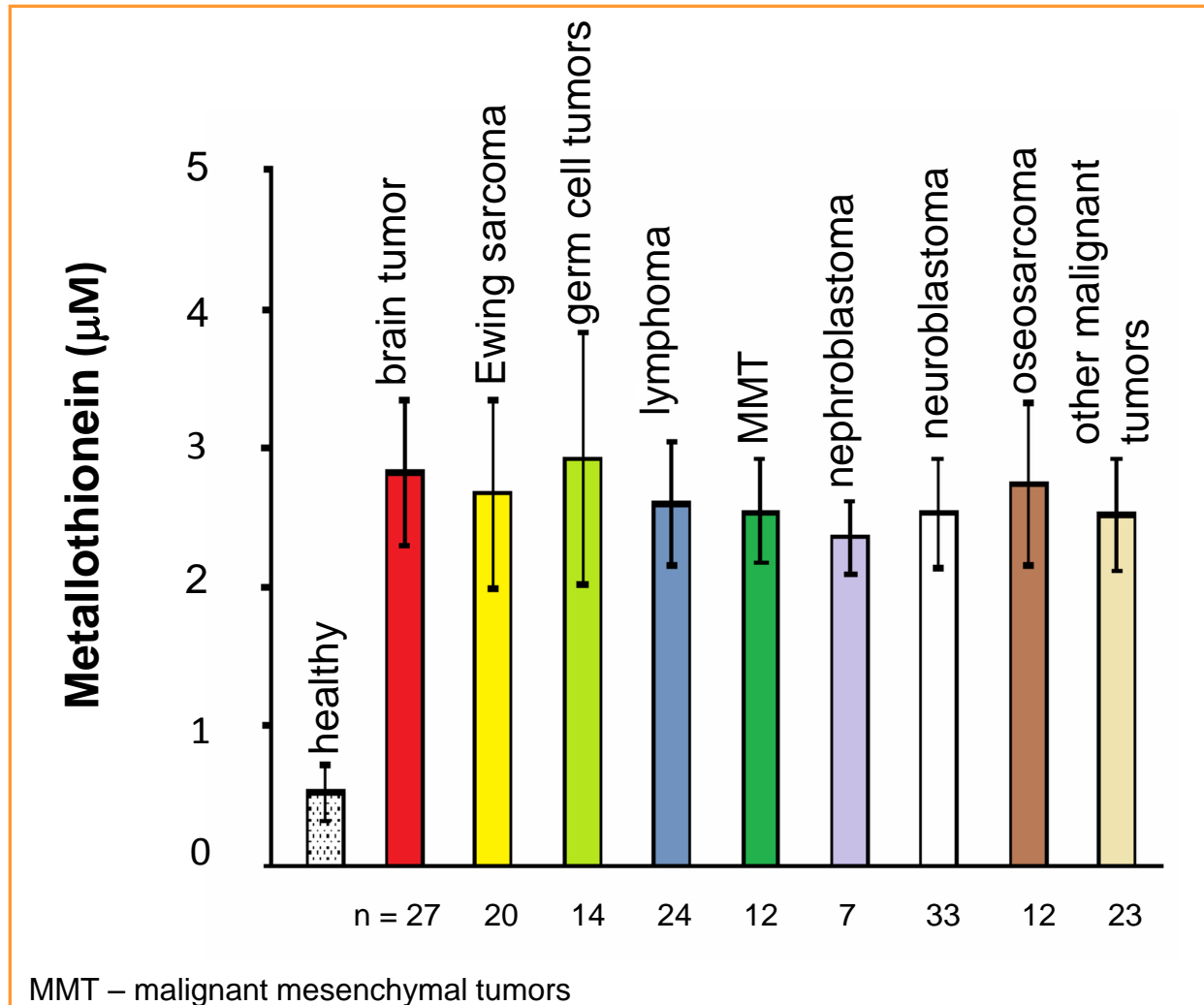
Electrochemical determination of metallothionein

- electrolyte: Brdička solution
- in solution: catalytic reaction due to interaction of $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$ with $-\text{SH}$ group from protein

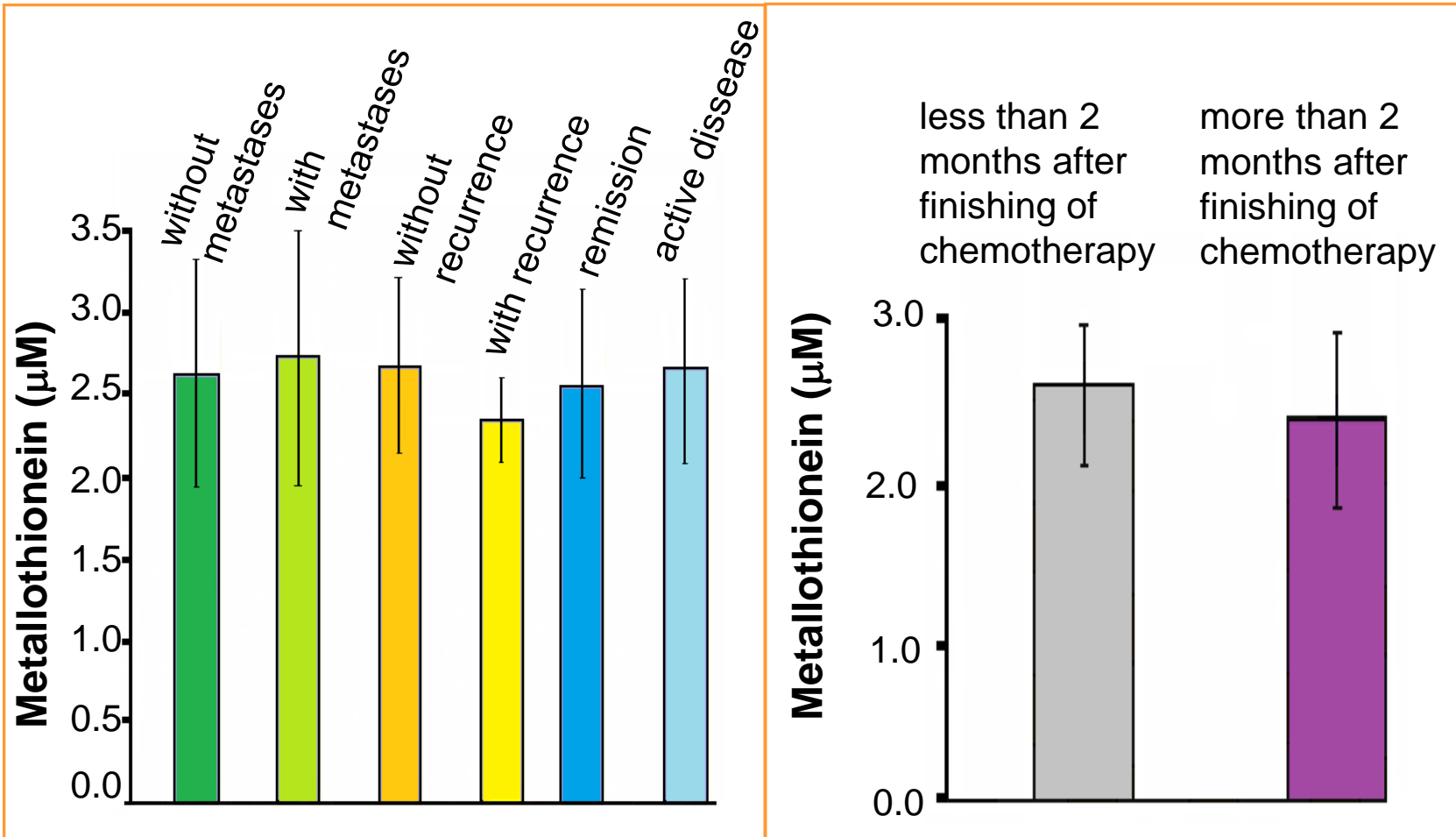


Metallothionein at children with cancer diseases

- 172 patients
- age: 0,1 – 19,5
- 71 girls and 101 boys



Metallothionein at children with cancer diseases



Summary

- MT levels were determined at 172 children patients with different malignant tumors.
- Significant difference between MT level and tumor type was not found.
- The highest MT level was found in germ cell tumor (2.94 ± 0.9) μM and brain tumor (2.82 ± 0.5) μM .
- Healthy adults have MT level 5x lower than patients with germ cell tumors.
- Important decrease of metallothionein was found after more than 2 months after finishing of chemotherapy.
- Metallothionein shows as a promising cancer marker.

Acknowledgement Laboratory of Metallomics nad Nanotechnologies

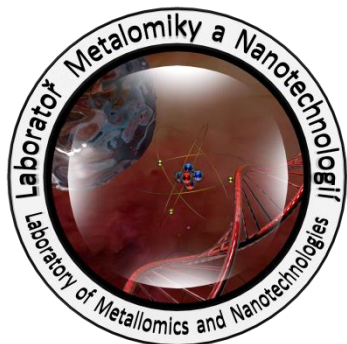
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Supported by:

NANOBIOMETALNET

CZ.1.07/2.4.00/31.0023



Thank you for your attention.