INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

Název: Značení virových proteinů kvantovými tečkami

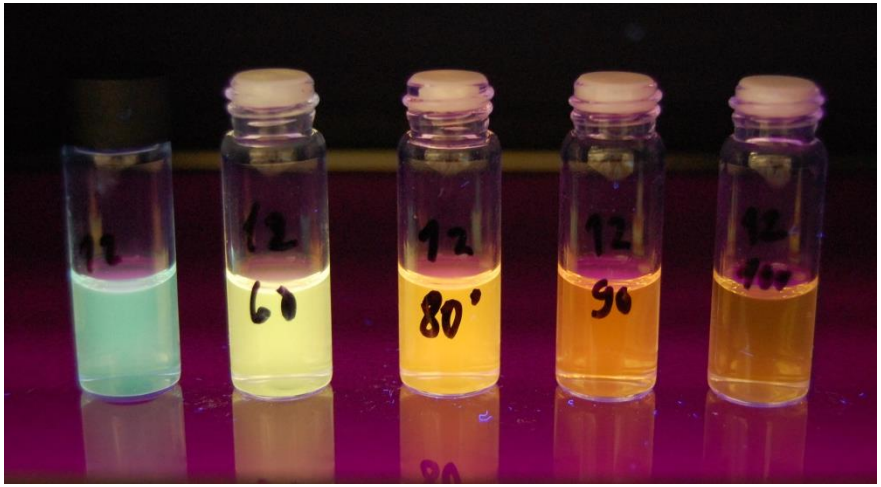
Školitel: Doc. RNDr. Pavel Kopel, Ph.D.

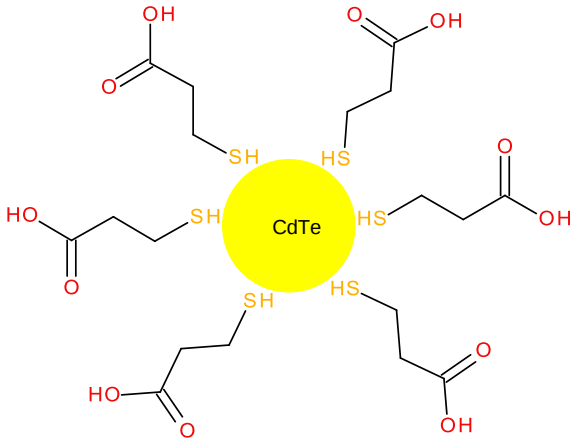
Datum: 15.1.2014

Reg.č.projektu: CZ.1.07/2.4.00/31.0023

Název projektu: Partnerská síť centra excelentního bionanotechnologického výzkumu

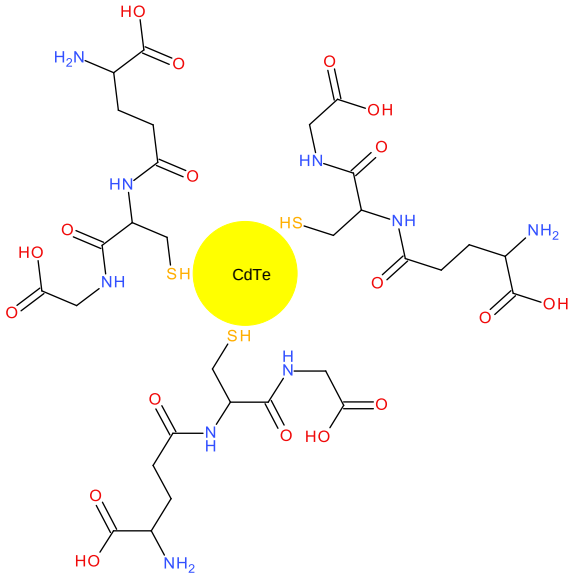
Quantum dots





Microwave preparation: cadmium(II) salt
Na_2TeO_3 resp. Na_2SeO_3
3-mercaptopropionic acid (MPA), glutathion (GSH)
or mercaptosuccinic acid
reduction with $NaBH_4$

CdTe MPA and CdTe GSH QDs



Proteins with CdS, PbS and CuS Quantum Dots

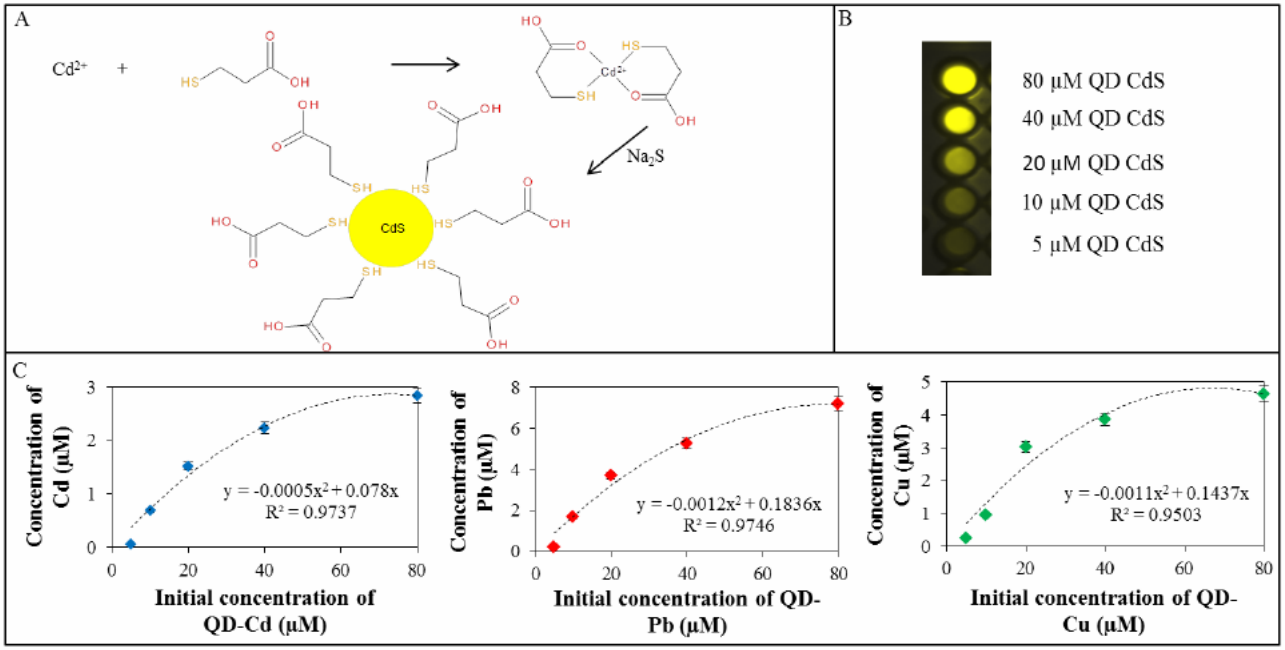
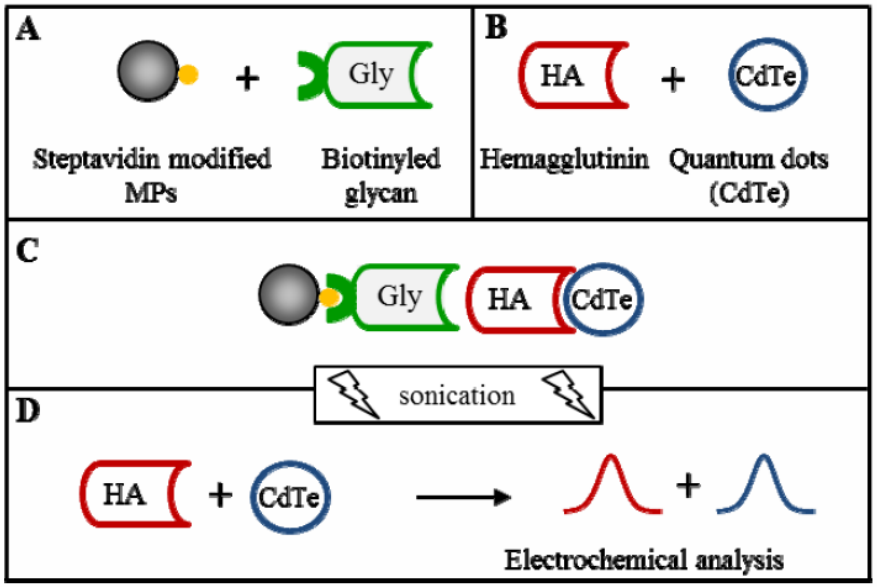


Figure 3. Scheme of QDs preparation. (**A**) Formation of CdS QDs covered by 3-mercaptopropionic acid. Possible structure of intermediate chelate formed in the reaction of Cd^{2+} and 3-mercaptopropionic acid is depicted. (**B**) Detection of fluorescence of CdS QDs. Carestream In-Vivo Xtreme Imaging System, excitation filter: 410 nm, emissions filter: 700 nm. (**C**) Dependence of Cd(II), Pb(II) and Cu(II) ions concentration on the applied concentration of QD-Cd, QD-Pb, and QD-Cu (concentration, which was used for the preparation of sample, namely complex H5N1 protein with CdS, PbS, CuS quantum dots) measured on glassy carbon electrode.

Int. J. Electrochem. Sci., 8 (2013) 10805 - 10817

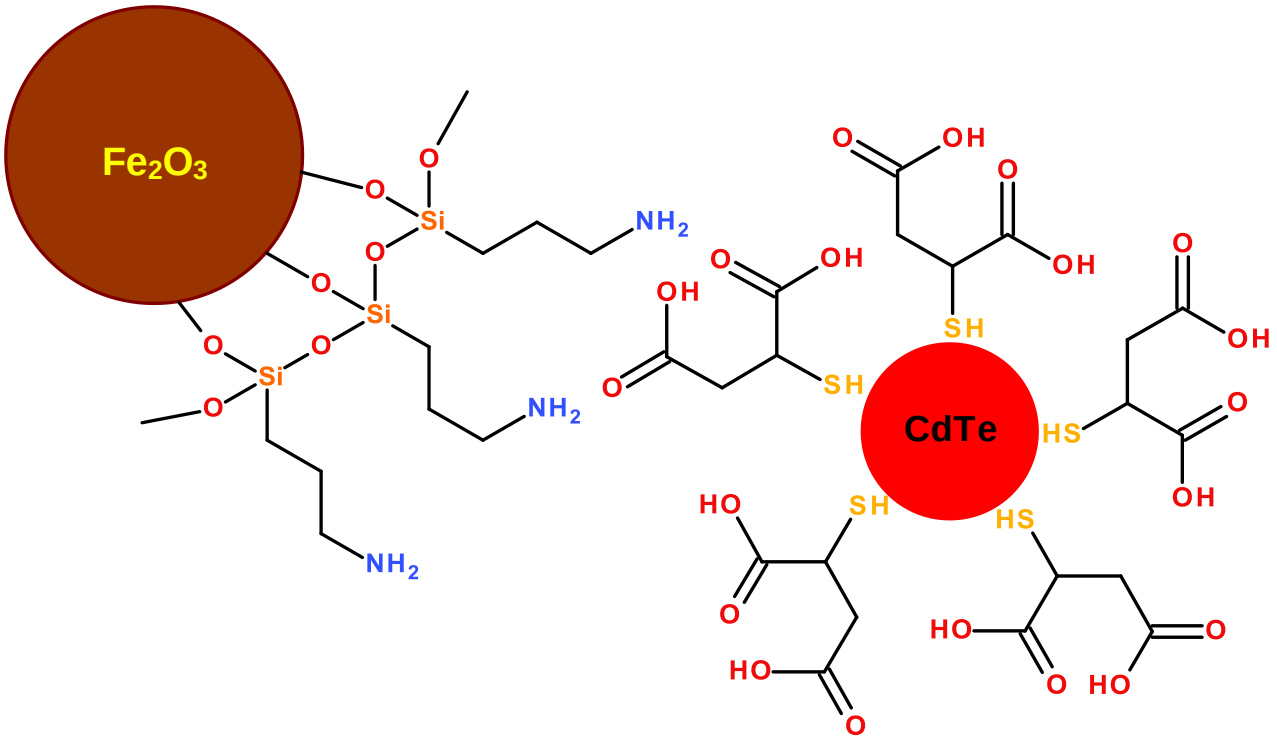
Beads-Based Electrochemical Assay for the Detection of Influenza Hemagglutinin Labeled with CdTe Quantum Dots

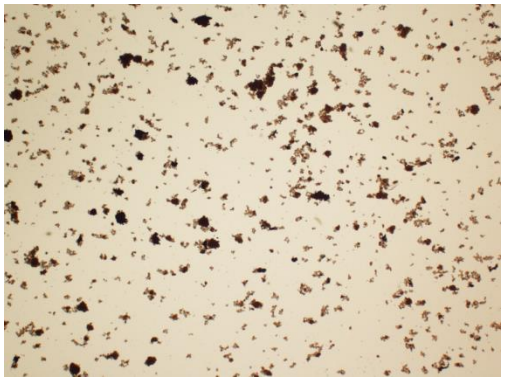
Figure 3. Scheme of isolation (**A**+**B**+**C**) and electrochemical detection (**D**) of vaccine hemagglutinin (vaxi HA) labeled with CdTe quantum dots (QDs); (**A**) Biotinyled glycan binding on streptavidin modified paramagnetic particles (MPs) based on biotin-streptavidin affinity, (**B**) HA labelling by CdTe, (**C**) magnetic isolation of HA-CdTe complex (based on glycan-HA affinity), followed by sonication and (**D**) electrochemical detection of HA and QDs parts. HA was detected by differential pulse voltammetry (DPV) connected with adsorptive transfer technique (AdT DPV) Brdicka reaction. QDs (Cd respectively) were detected by DPASV. Other experimental conditions see in Figure 2.

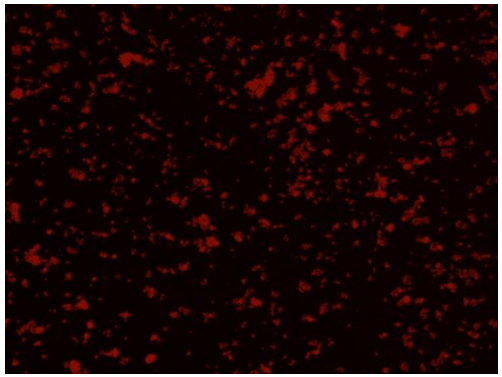


Molecules 2013, 18, 15573-15586

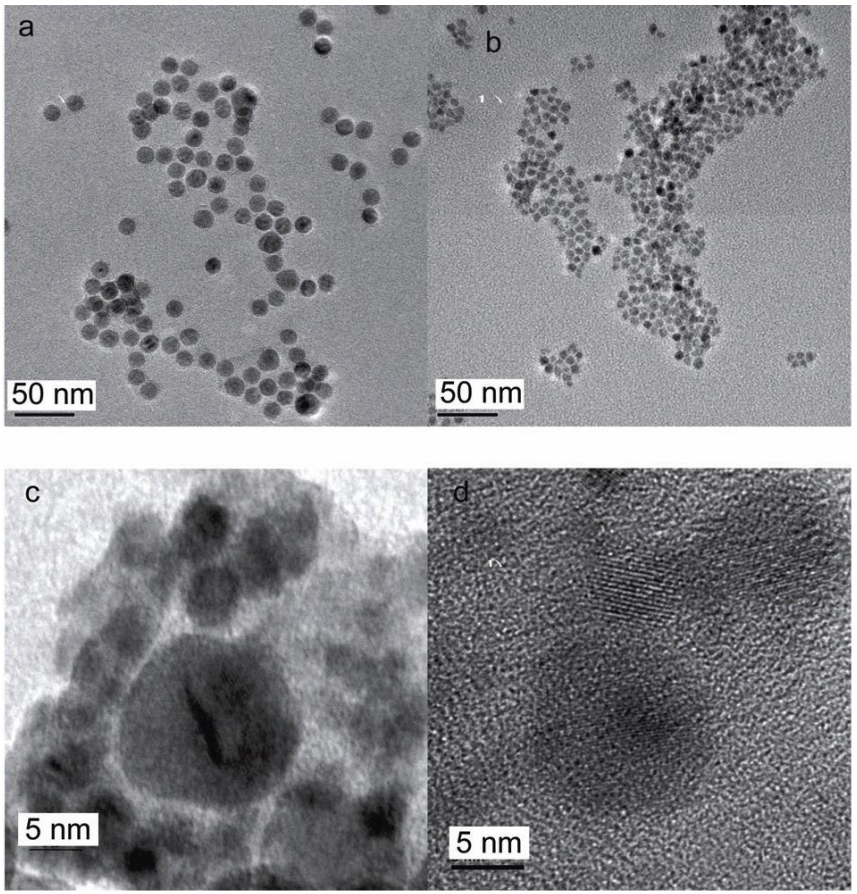
Iron oxide and quantum dot interaction

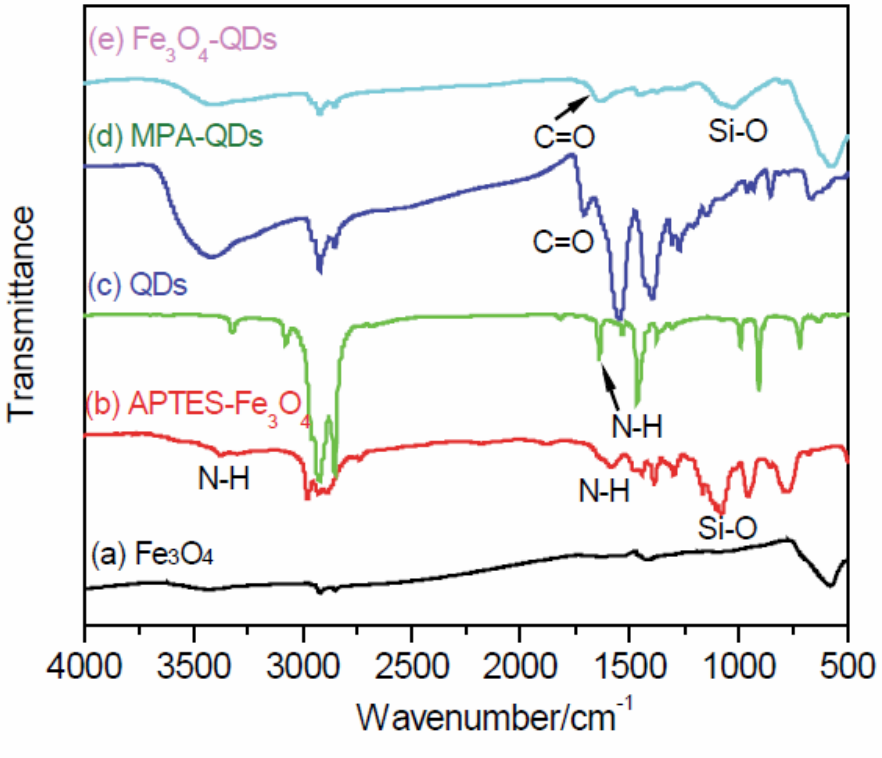






Preparation and Properties of Magnetic Fluorescent Nanomaterials





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Acknowledgements

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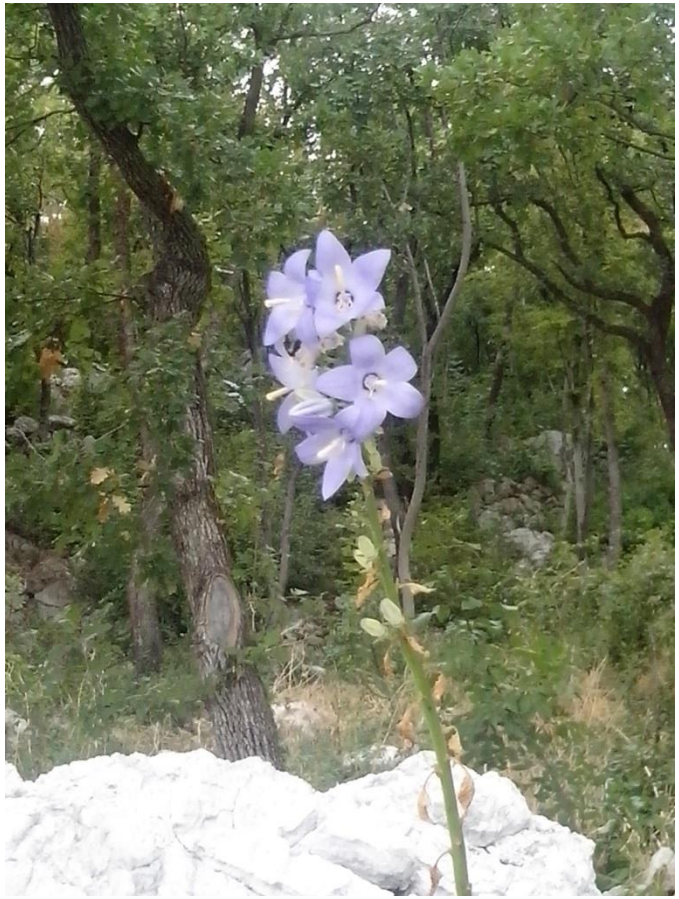

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LibertyBLUE
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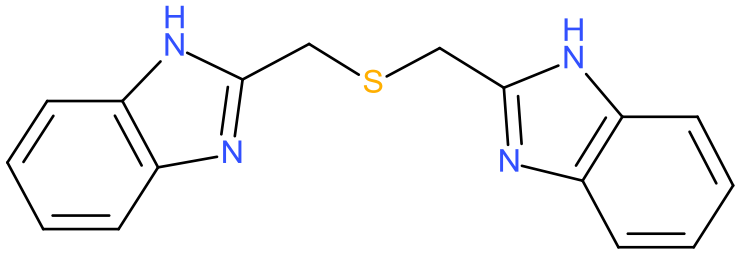
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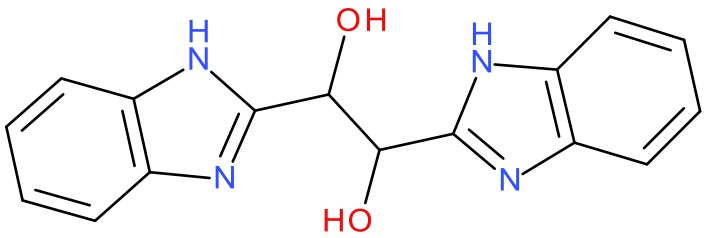
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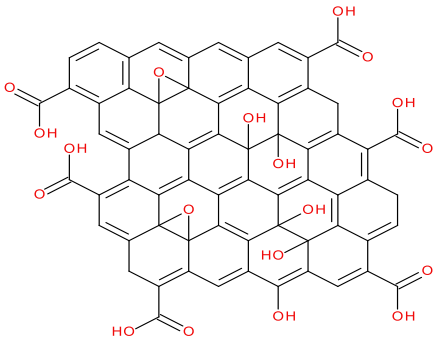

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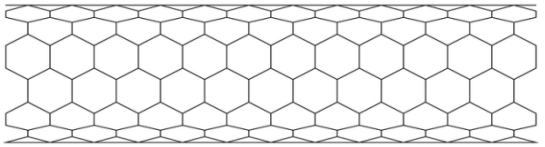
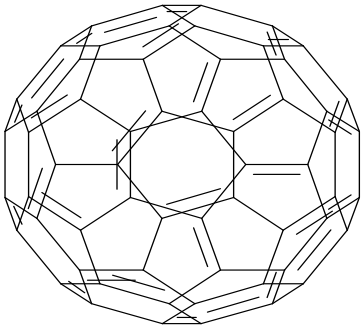
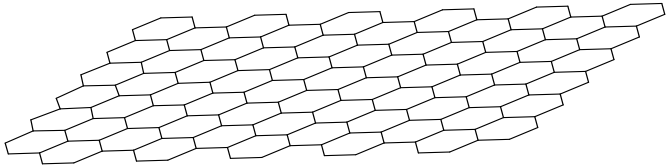


SWCNT (MWCNT)

CARBON MATERIALS
IN MEDICINE



FULLERENE



GRAPHENE

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EVROPSKÁ UNIE
MINISTERSTVO ŠKOLSTVÍ, MLÁDEŽE A TĚLOVÝCHOVY
OP Vzdělávání pro konkurenceschopnost
INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

Thank you for your attention

Reg.č.projektu: CZ.1.07/2.4.00/31.0023

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NanoBioMetalNet