

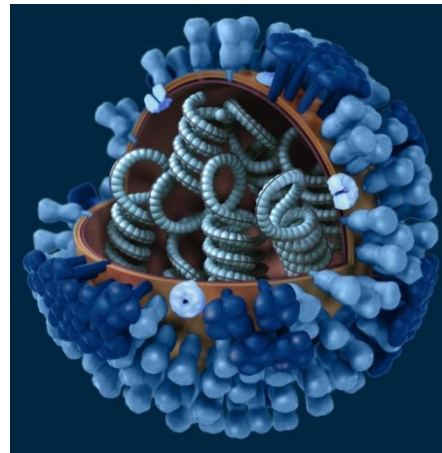
Název: **Isolation and detection of  
influenza virion parts**

Školitel: **Ludmila Krejčová**

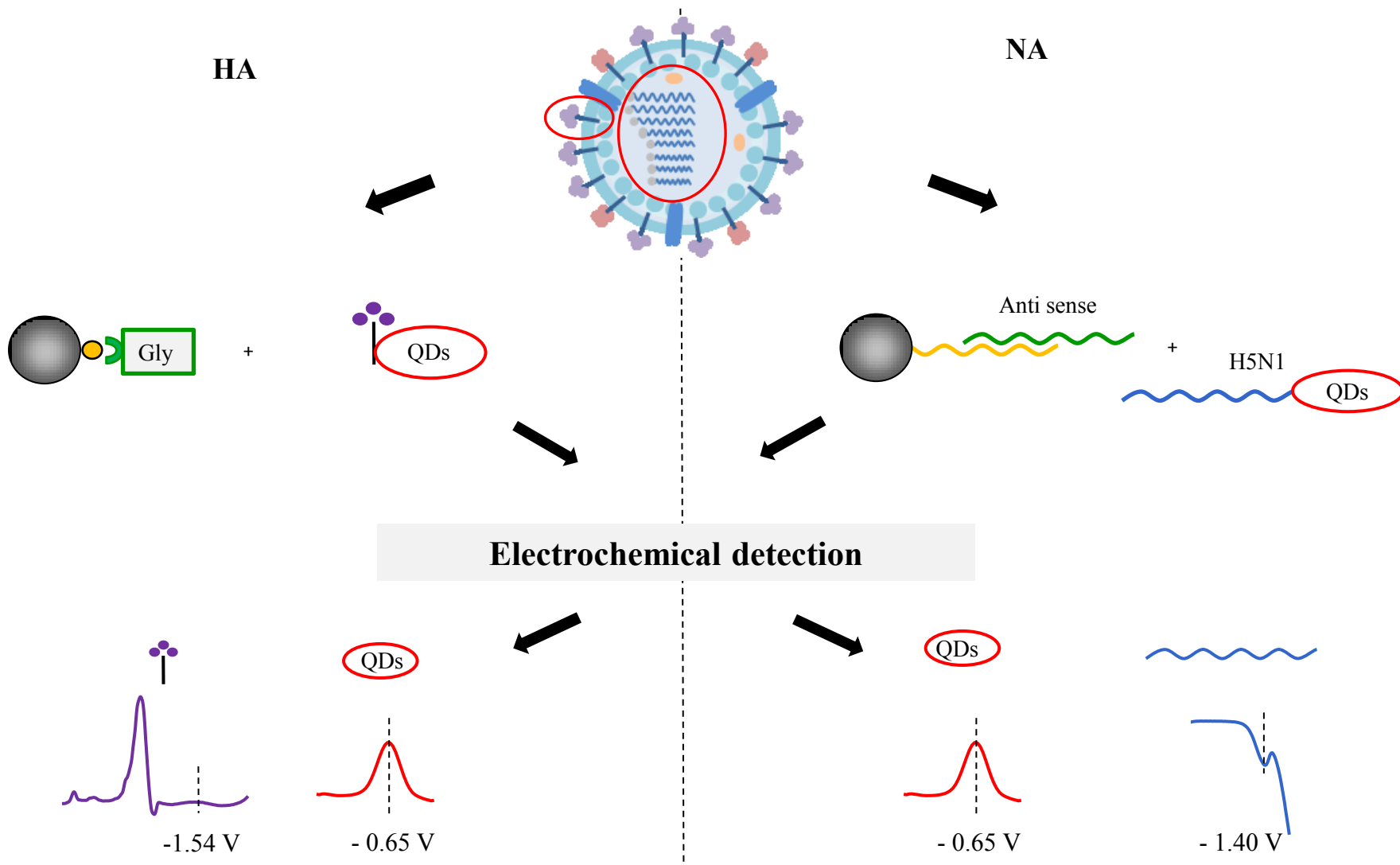
Datum: **15.1.2014**

# CONTENT

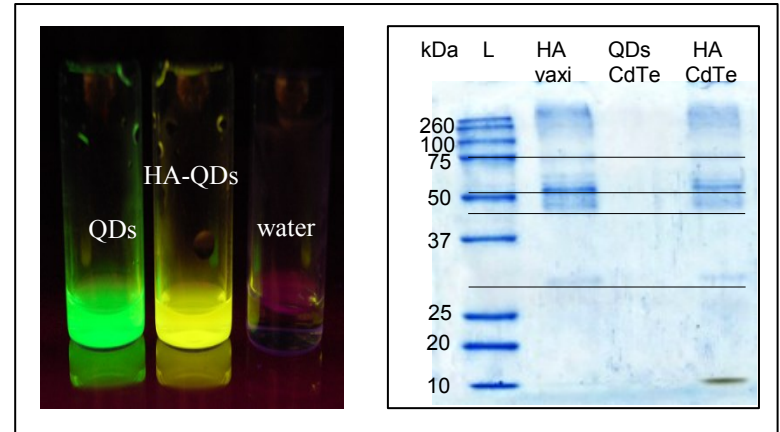
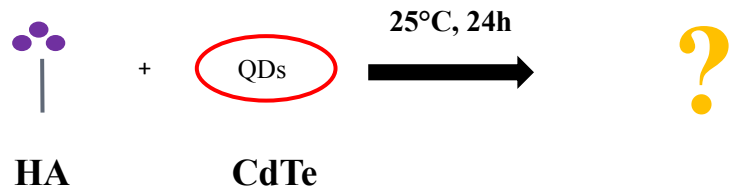
- Target parts of influenza virion for detection strategies
- Isolation and detection of Hemagglutinin
- Isolation and detection of influenza derived oligonucleotide
- Conclusion
- Future prospects



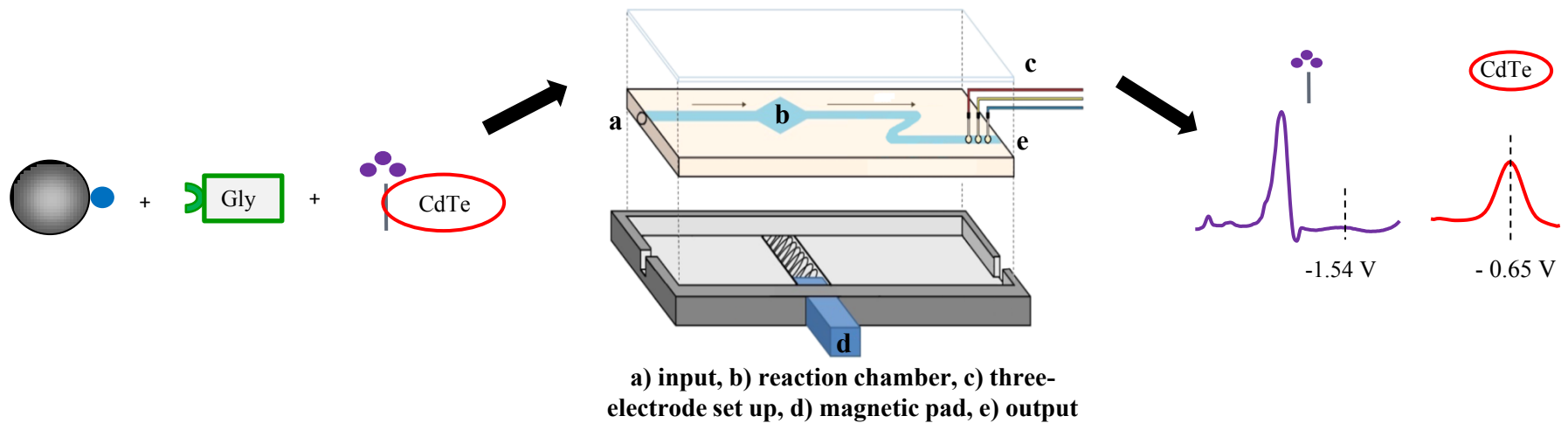
# TARGET PARTS OF INFLUENZA VIRION FOR DETECTION STRATEGIES



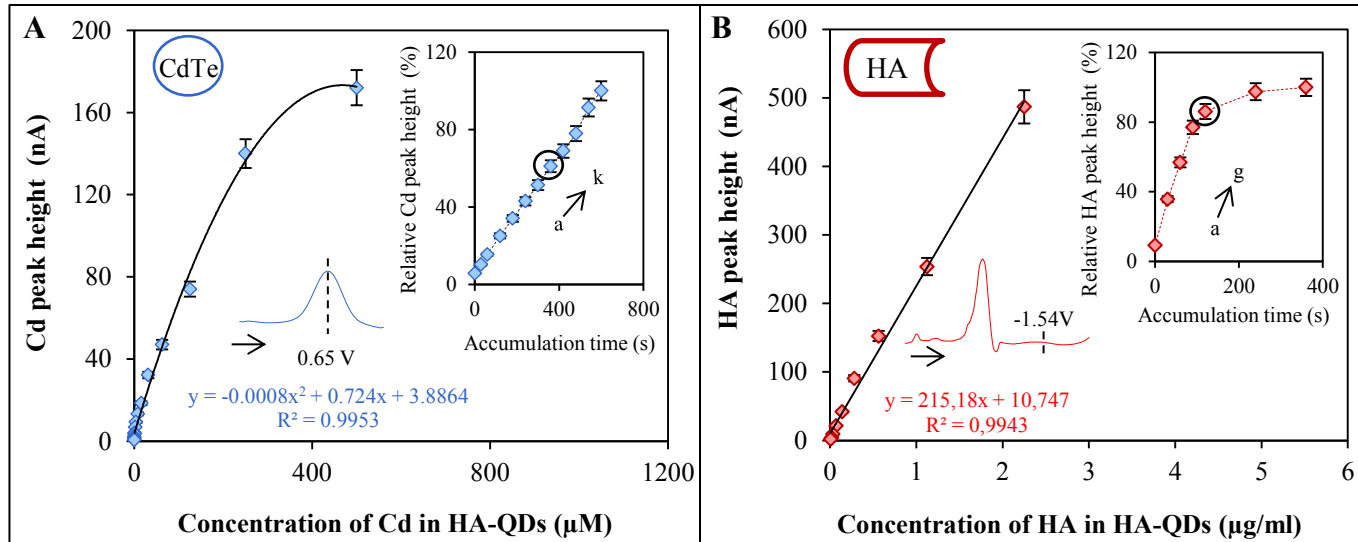
# ISOLATION AND DETECTION OF HA LABELED BY QDs (CdTe)



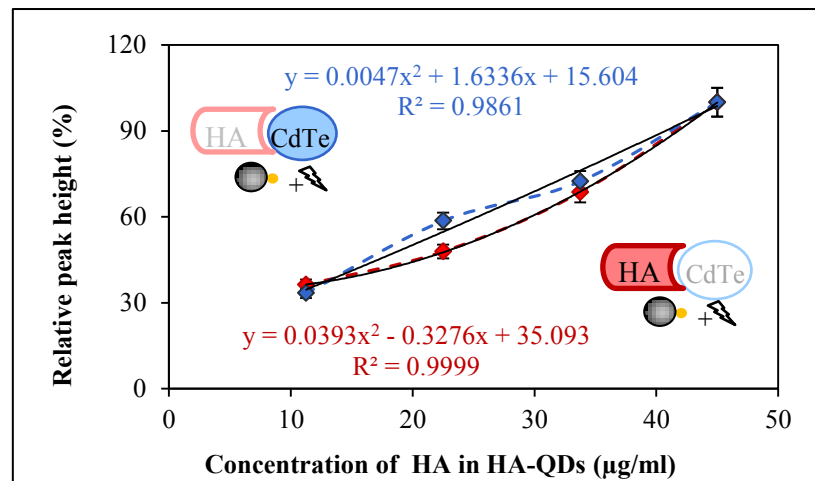
## Isolation of HA (Vaxigrip<sup>®</sup>) using glycan modified MPs



# RESULTS



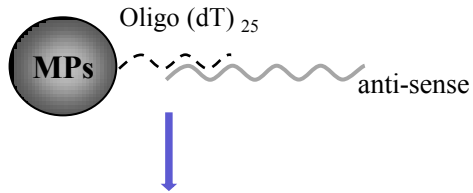
Electrochemical characterisation of HA-QDs complex by differential pulse voltammetry (DPV). **A** Dependence of Cd peak height on cadmium concentration present in complex HA-CdTe measured by ASV DPV. **B** Dependence of HA peak height on HA concentration present in complex HA-CdTe measured by AdT DPV.



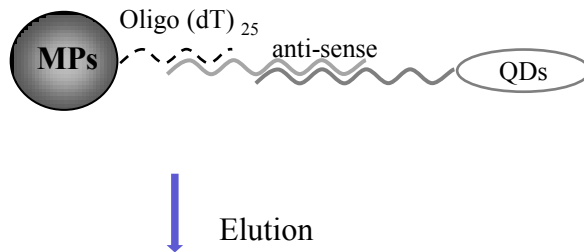
Dependence of relative peak heights (related to maximum values for individual peaks) on concentration of vaccine HA in HA-CdTe ( $\mu\text{g/ml}$ ).

# ISOLATION AND DETECTION OF INFLUENZA DERIVED ODNs USING THREE DIFFERENT QDs (CdS, PbS, ZnS)

## Hybridisation of anti-sense on (dT)<sub>25</sub> modified MPs

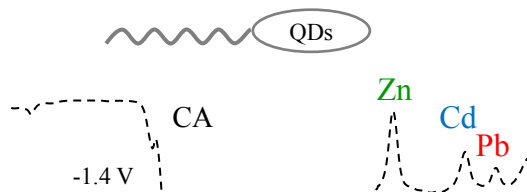


## Hybridisation of ODN bounded with QDs



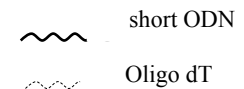
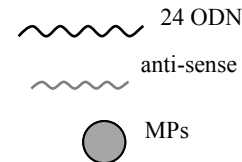
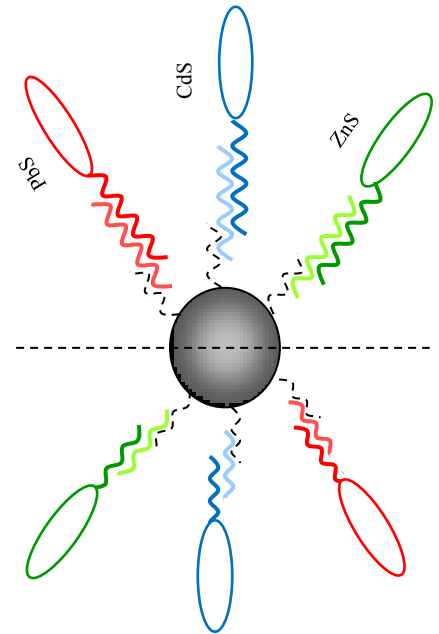
Elution

## Electrochemical detection of ODN a QDs

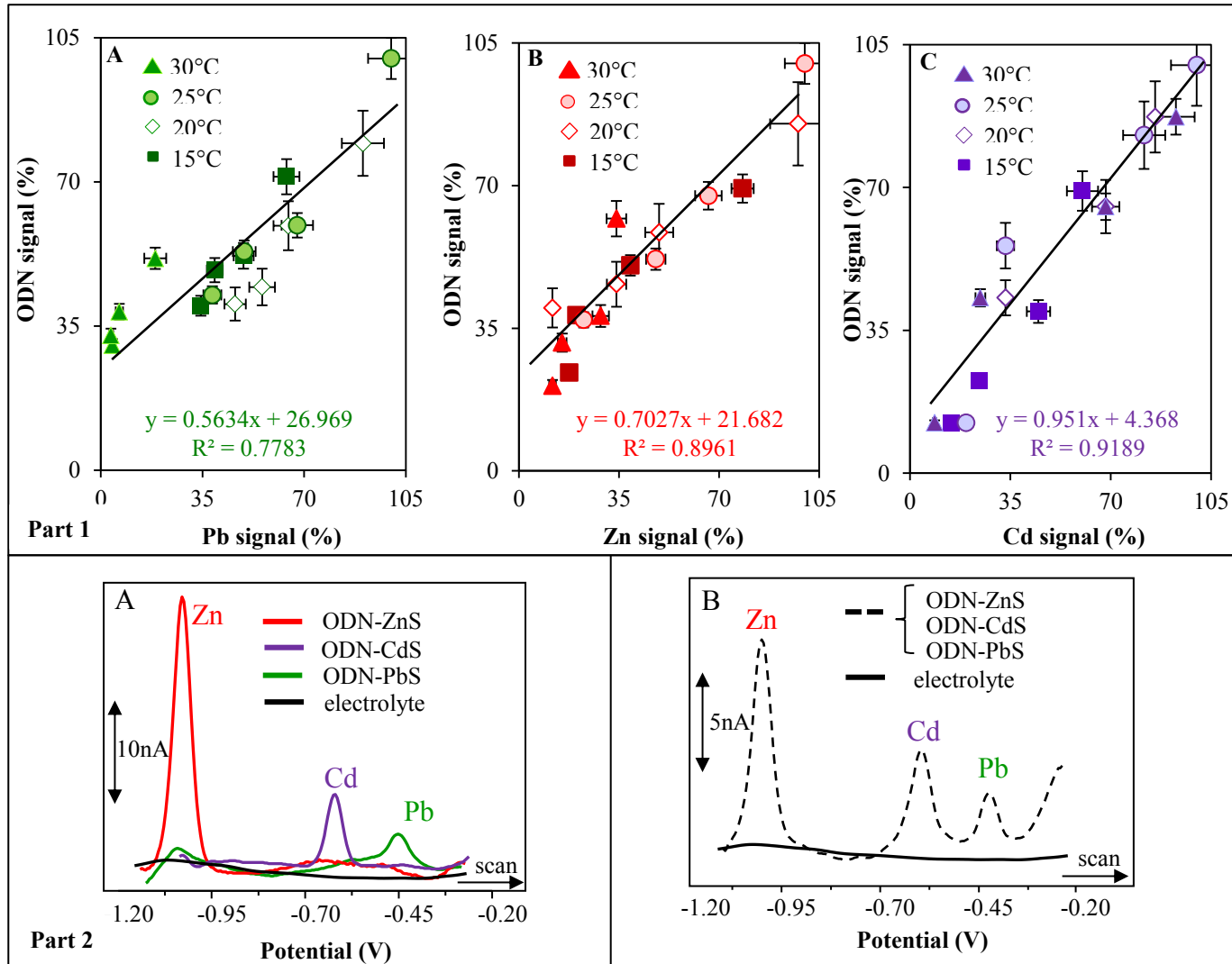


BAR CODE  
long (24) ODN

BAR CODE  
short (12) ODN



# RESULTS



**Part 1:** Correlation between the relative peak height of ODN and metal ions (both related to individual maximum values) for hybridisation temperatures: 30°C, 25°C, 20°C and 15°C and concentration of ODN-QDs: 2.5; 5; 10 a 20 μg/ml. **Part 2:** A: voltamograms of Zn, Cd and Pb from complex ODN-ZnS (-); ODN-PbS (-) and ODN-CdS (-), measured by DPV (concentration of ODN was 2 μg/ml); B mixture of ologonucleotides (from 2/A) (1:1:1).

# FUTURE PROSPECTS



- Characterisation of HA-Cd QDs complex
- Immunoassay and subtyping of Influenza A (beads based)
- Optimization of 3D chip fabrication
- Anti-sense therapy of influenza





INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

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# Thank you for your attention

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

Název projektu: Partnerská síť centra excelentního bionanotechnologického výzkumu

