

Potential of carbon nanoparticles in influenza treatment

Name:

Author: Zbyněk Heger

Date: 15.1.2014

Why carbon nanoparticles?

- Membranes penetration

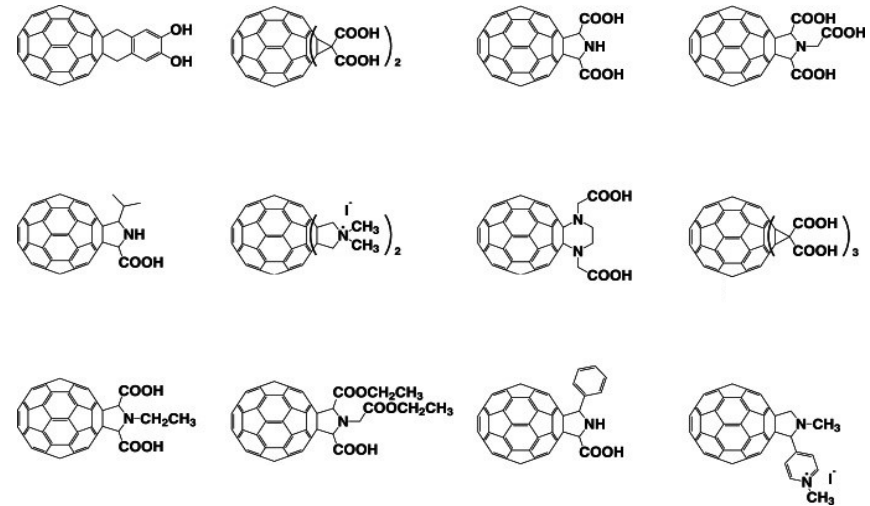
- Interaction with lipid bilayer

- Nanotransporters

- Modifications (derivates)

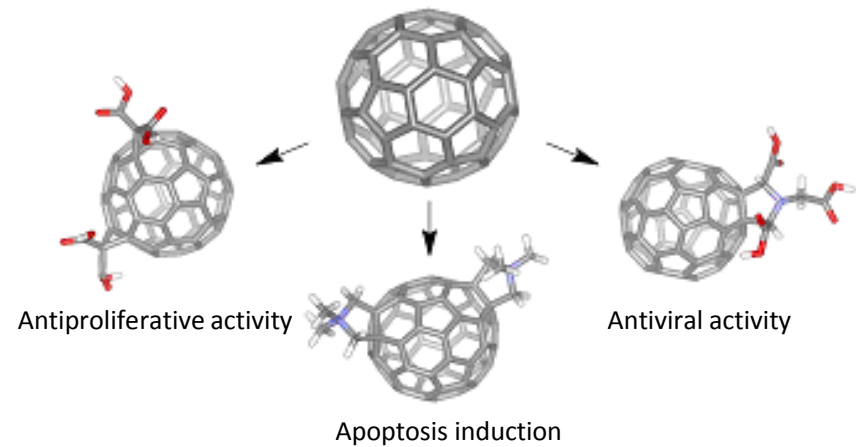
- Sensors/Lab-on-a-Chip platforms

- Fullerenes; MWCNT – toxicity at high levels



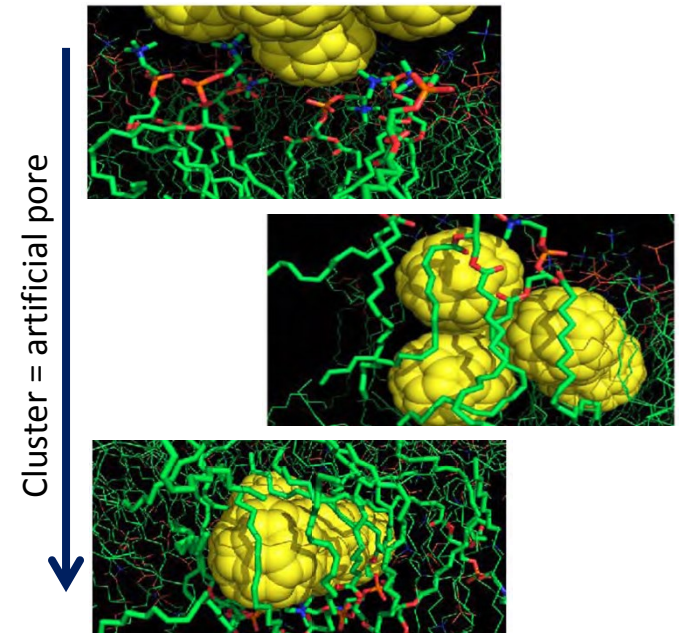
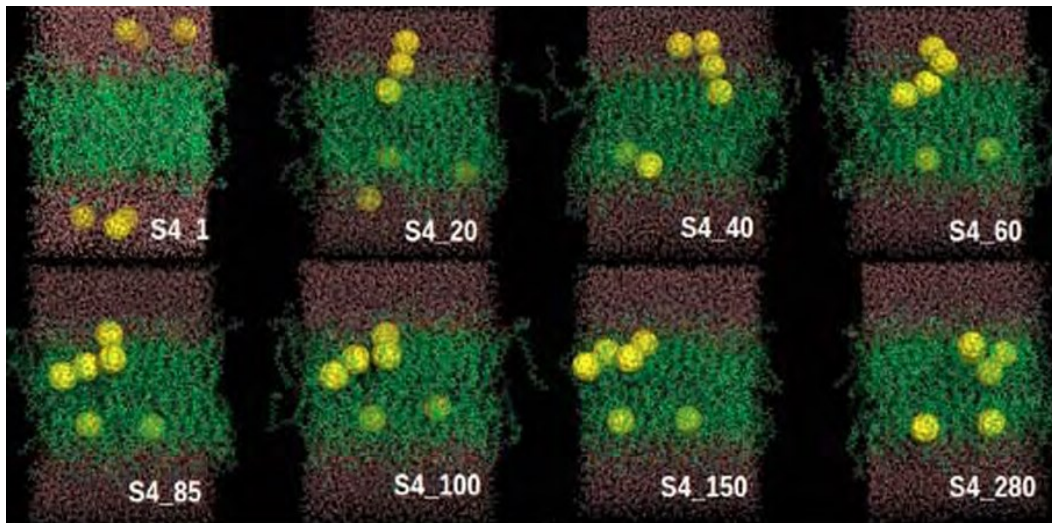
Derivates (esp. Fullerenes)

- Inhibition of HIV-protease
- Inhibition of HIV Reverse Transcriptase
- Antiproliferative Activities
- Induction of Apoptosis
- Intracellular Generation of Reactive Oxygen Species



Carbon and influenza

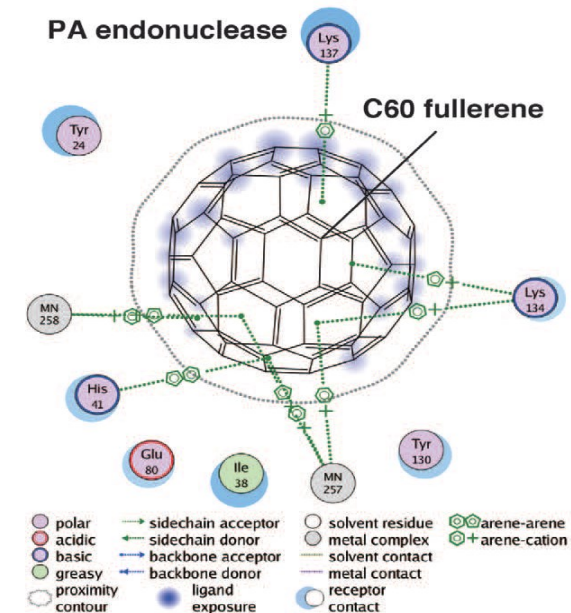
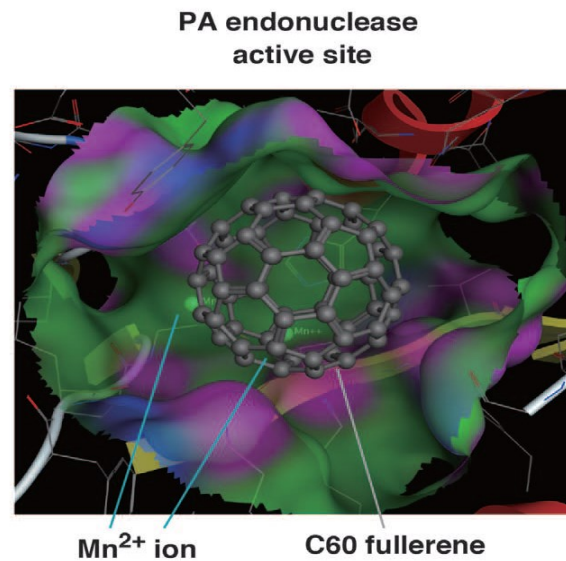
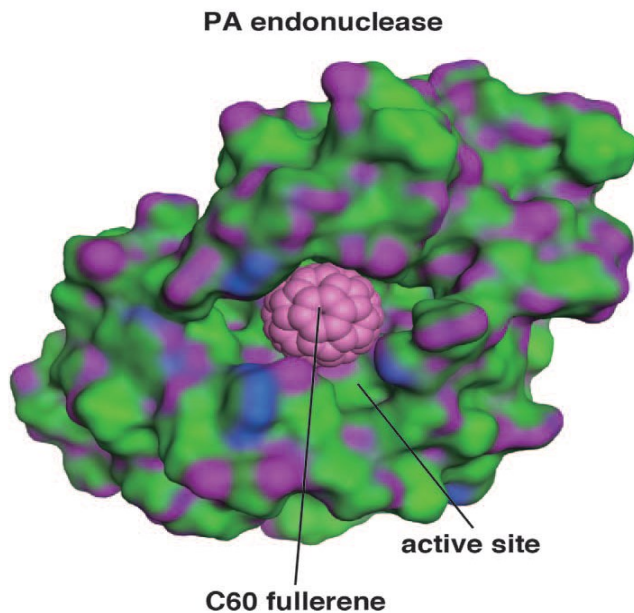
- Unmodified fullerenes – clusters in lipid membrane (energetically favorable phase)
- Advantageous for nanotransporter targeted to membrane organelles?



Carbon and influenza

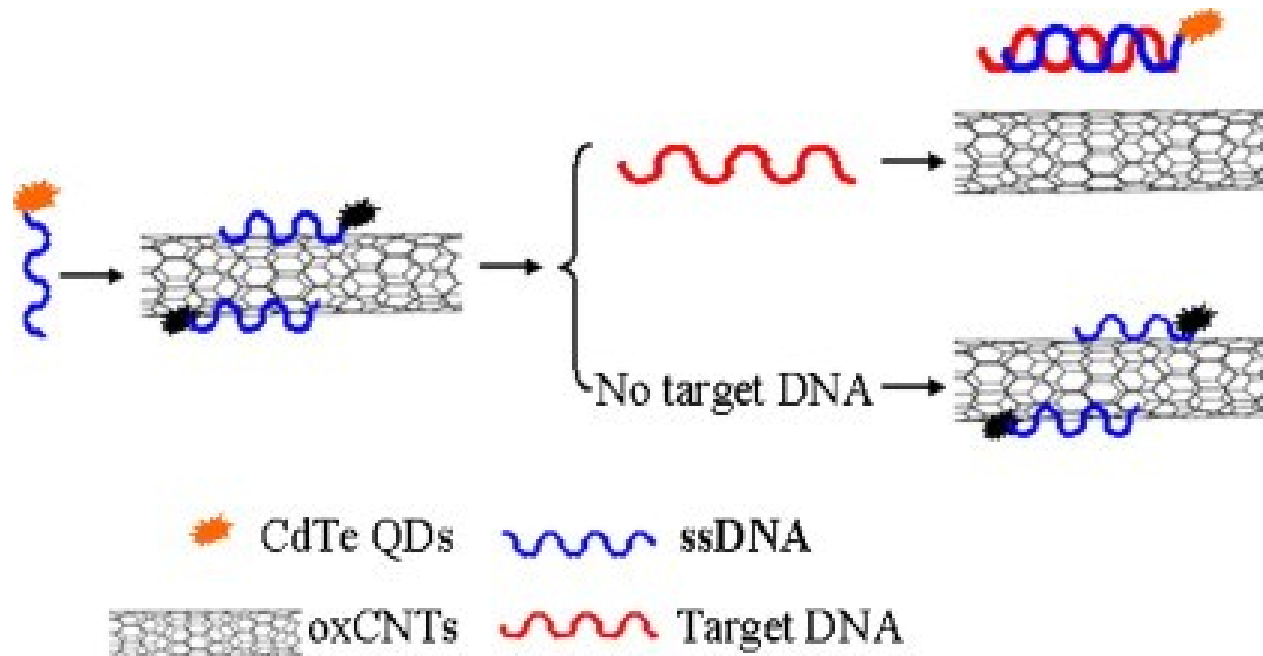
- Fullerene derivatives – inhibitory activity towards influenza PA endonuclease

- RNA cleavage



Carbon and influenza

- Sensing - in combination with QDs
- CNTs – acceptors/quenchers



Outlooks

- Various modifications of SWCNT, MWCNT, F-C₆₀, etc.
- Targeted nanotransport
- Cargo ? (gene therapy, peptides, antivirotics)

**Utilization of carbon NPs exceptional
properties to make the influenza treatment
more effective.**



INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

Thank you for your attention

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

Název projektu: Partnerská síť centra excelentního bionanotechnologického výzkumu

