Research & Drinks

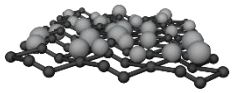
Freie Universität Berlin

Biodegradable 2D Nanomaterials

Dr. Ievgen Donskyi

AG Donskyi

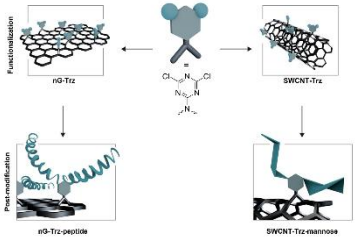
20.11.2024



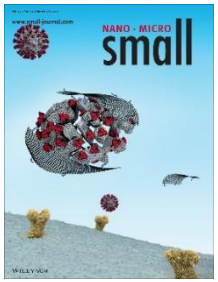
Who is PI

Freie Universität Berlin

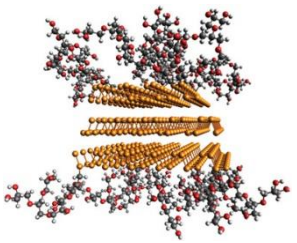
2023	Junior Group Leader *FUB*
2021	Research Trip *EPFL, Switzerland*
2020	Group Leader Surface Analytics *SupraFAB, FUB*
	Subgroup Leader *AG Prof. Haag, FUB*
	Postdoctoral Researcher *AG Prof. Haag, FUB*
2019	Research Trip *China Pharmaceutical University, China*
	Doctorate (Chemistry; *summa cum laude*), *FUB*
2016	Guest Scientist *BAM*
2015	Master's degree (Polymer Science) *FUB, HUB, TUB, UP*
2013	Diploma (Business Administration) *Saint Petersburg State University*
	Master's degree (Biology) *Saint Petersburg State University*
2010	Bachelor's degree (Chemistry) *Saint Petersburg State University*



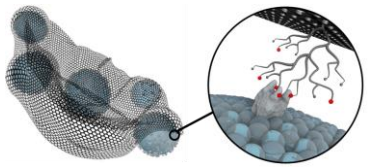
*Appl. Surf. Sci.**, **2023**



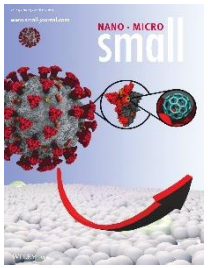
*Small**, **2021**



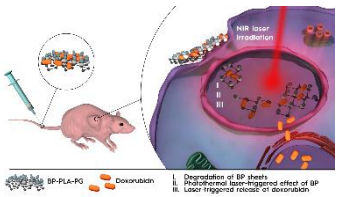
*Adv. Mater. Inter.**, **2022**



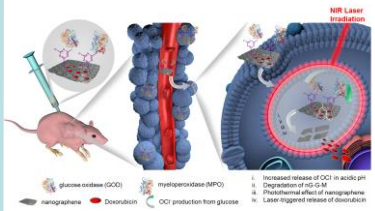
Adv. Mater. Inter., **2021**



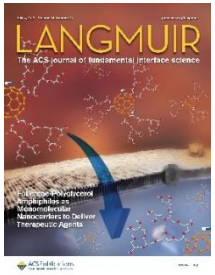
*Small**, **2023**



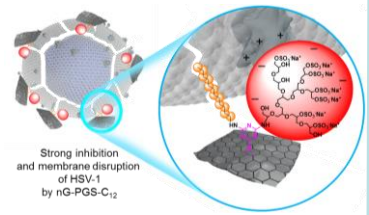
*Appl. Nano Mater.**, **2022**



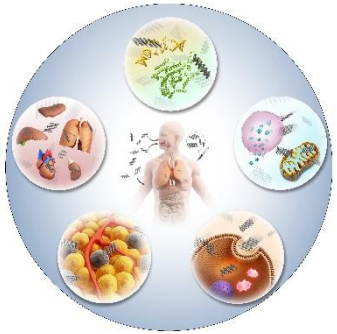
*Nanoscale**, **2020**



Langmuir, **2017**



Nanoscale, **2019**



*Angew. Chem.**, **2022**

Who we are

Postdocs

Na Xing
SupraFAB Biolab Responsible
Virologist
Research on Antiviral Antibacterial, and Anticancer Materials

Rameez Ahmed
AFM Expert
Chemical Engineer
Research on Antibacterial Materials

PhDs

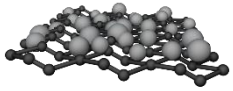
Jasmin Er
XPS Expert
Chemist
Research on Degradable Antiviral Materials

Taylor Page
SS NMR Expert
Chemist
Research on Polymer-based Antiviral Materials

Robert Schusterbauer
ToF-SIMS Expert
Chemist
Research on 2D Nanomaterials

Technical Assistant

Marwin Raue
Synthesis Expert
Black Phosphorus Production
Glovebox, Ball Mill, Polymer synthesis



Research Students

Freie Universität Berlin

Guest Scientists

M.Sc. Mona Mohamed

Erasmus+ Guest PhD Student (10.2024-now)

Anticancer materials

+49 30 838 68853

Master students

B.Sc. Sandhya Khadka

Research Practice Student / Master Thesis Student (08.2024 - now)

Antiviral materials

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B.Sc. Bhumika Tarkeshvar Patil

Research Practice Student / Master Thesis Student (09.2024 - now)

Antibacterial materials

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B.Sc. Virajani Wijesooriya

Research Practice Student / Master Thesis Student (08.2024 - now)

Antibacterial materials

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Bachelor students

Anastasiia Sydorova

Bachelor Thesis Student (10.2024-now)

Black phosphorus polymer conjugates

Interns

B.Sc. Srijan Duarah

Research Practice Student (09.2024 - now)

Antiviral materials

+49 30 838 918039

B.Sc. Seungeun Yeom

Research Practice Student (10.2024 - now)

Antibacterial materials

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Student Assistants

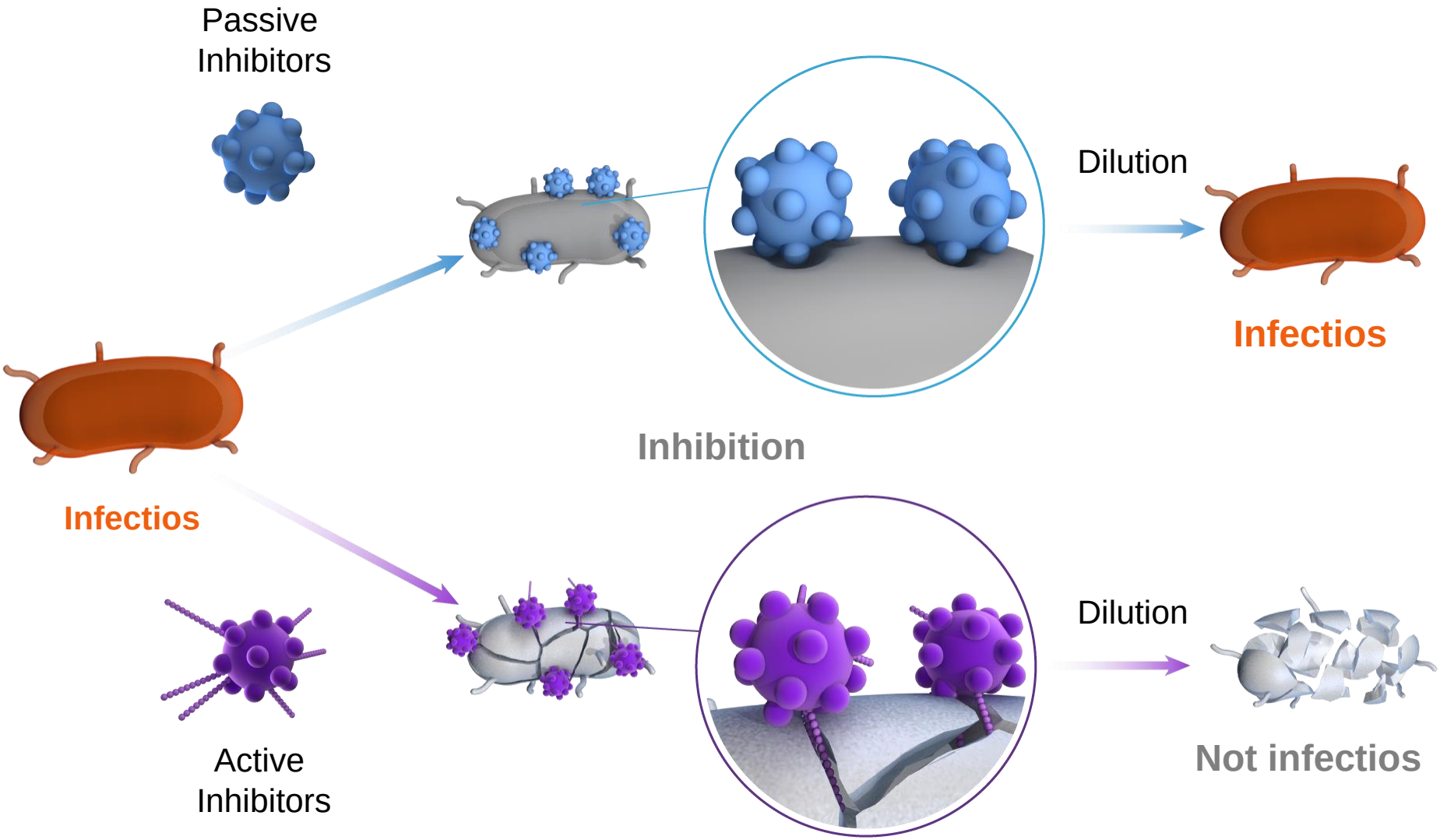
Maik Rosentreter

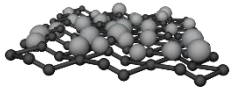
Student Assistant (11.2024 - now)

Antiviral materials, Antibacterial materials

rosentrem01@zedat.fu-berlin.de

What we research

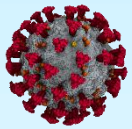




What we research

Freie Universität Berlin

Virus



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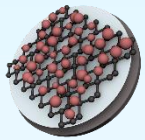
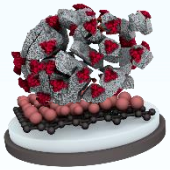
Broad-spectrum virus-rupturing material

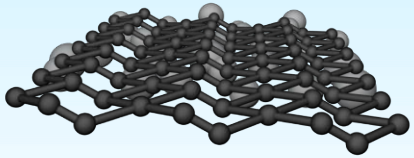


Ruptured Virus



Antiviral

Antipathogenic surface coverage



Black Phosphorus Sheet

Antibacterial

Bacteria

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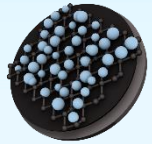
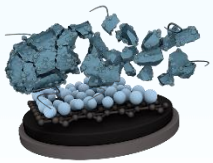
Broad-spectrum bacteria-rupturing material



Ruptured Bacteria

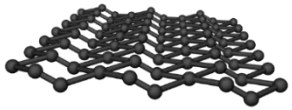


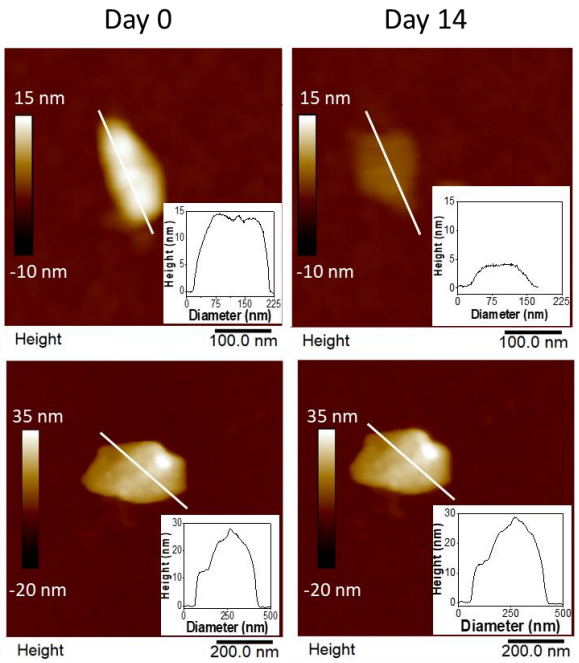
Self-degrading pathogen-rupturing materials

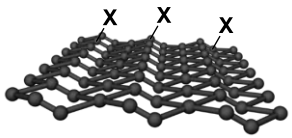
Antiviral Spray

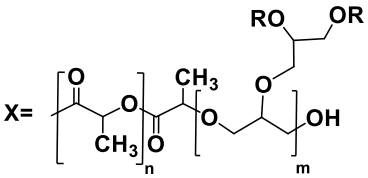
Antibacterial Lotion

Ongoing research



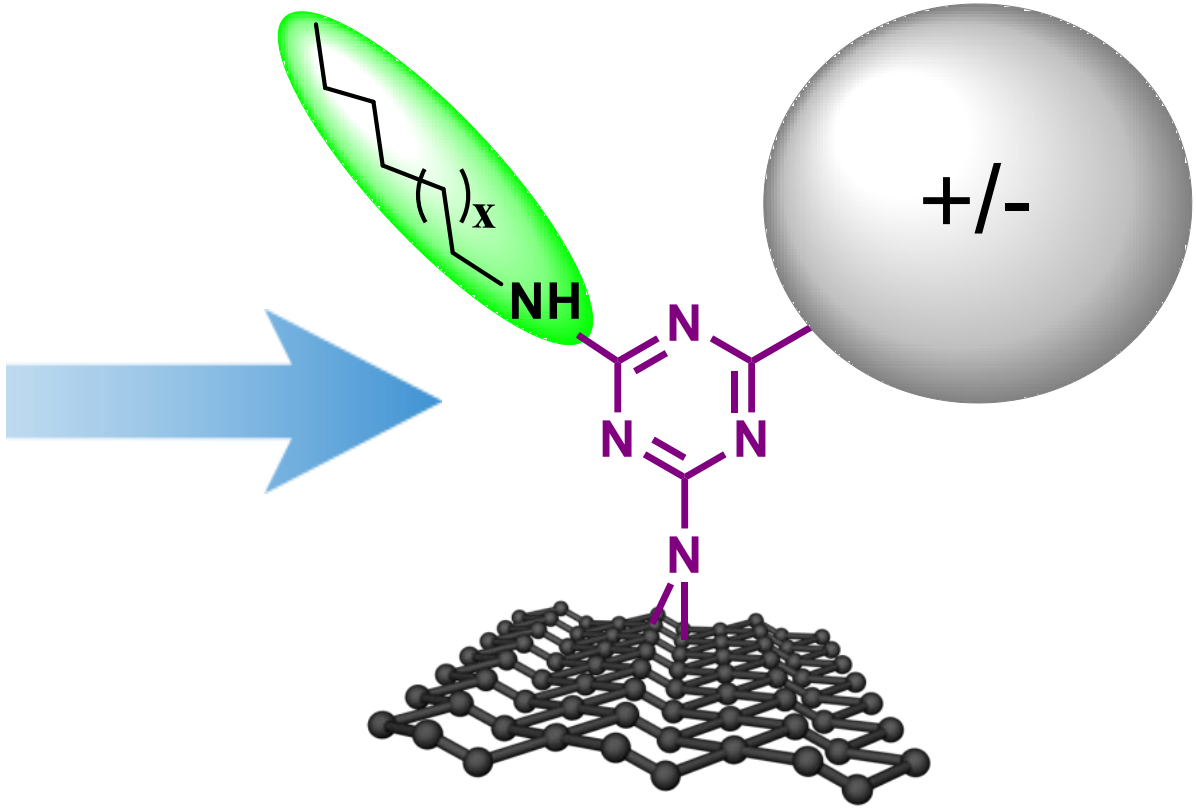






Aliphatic chains for breaking up pathogens

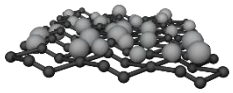
Pathogen Binding site



I. S. Donskyi* *et al.*, **2022**, *ACS Appl. Nano Mater., 5, 9, 13417–13424*

Needed skills

- Schlenk line experience
- Basic knowledge of characterization methods, including CHNS, NMR, IR, UV/Vis spectroscopies, DLS, Zeta-potential, TGA, XPS, ToF-SIMS, solid state NMR, AFM
- PowerPoint, Origin, MestreNova
- Concentration calculations



Possible project topics

Freie Universität Berlin

- Black phosphorus polysaccharide conjugates as viral inhibitors
- Black phosphorus PNIPAM conjugates for theranostic applications
- Polymer polysaccharide conjugates to prevent bacterial infections
- Titanium carbide polymer derivatives for anticancer treatment
- Titanium carbide derivatives for antiviral applications
- Fullerene derivatives for antibacterial applications
- Degradable 2D materials for bone regeneration

Thank you for your attention

Freie Universität Berlin

Group Page:

X: @Donskyi_Lab






Biodegradable 2D Nanomaterials

Funding

Bundesministerium für Bildung und Forschung

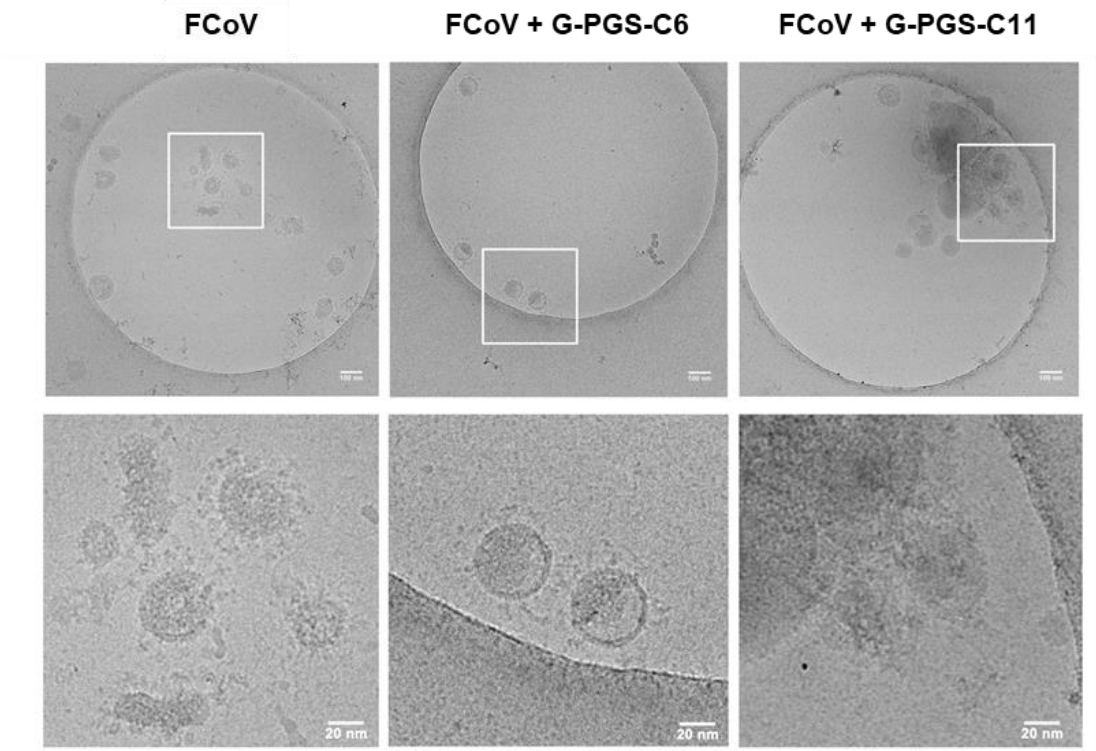
DFG Deutsche Forschungsgemeinschaft

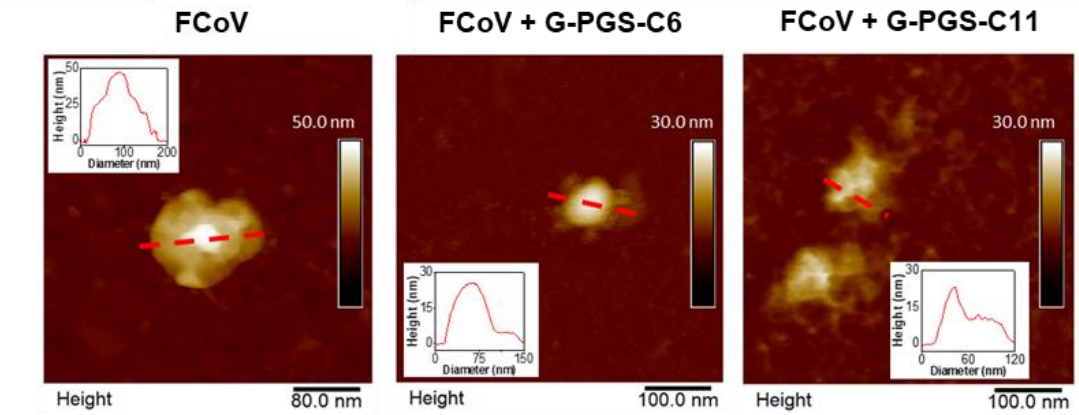
SupraFAB

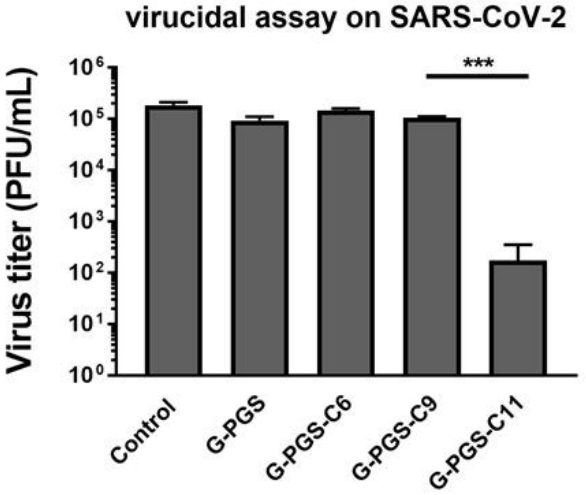
DAAD

ERASMUS+

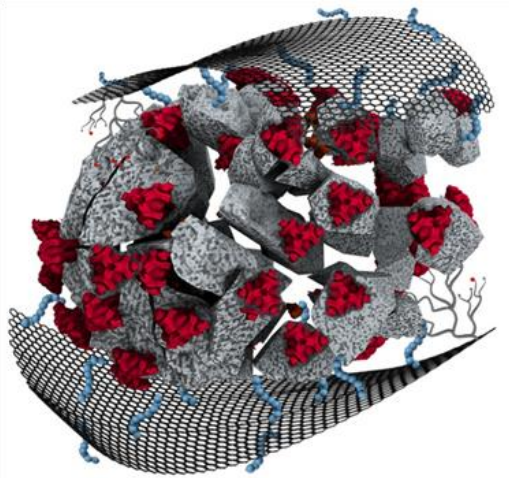
Examples of done projects





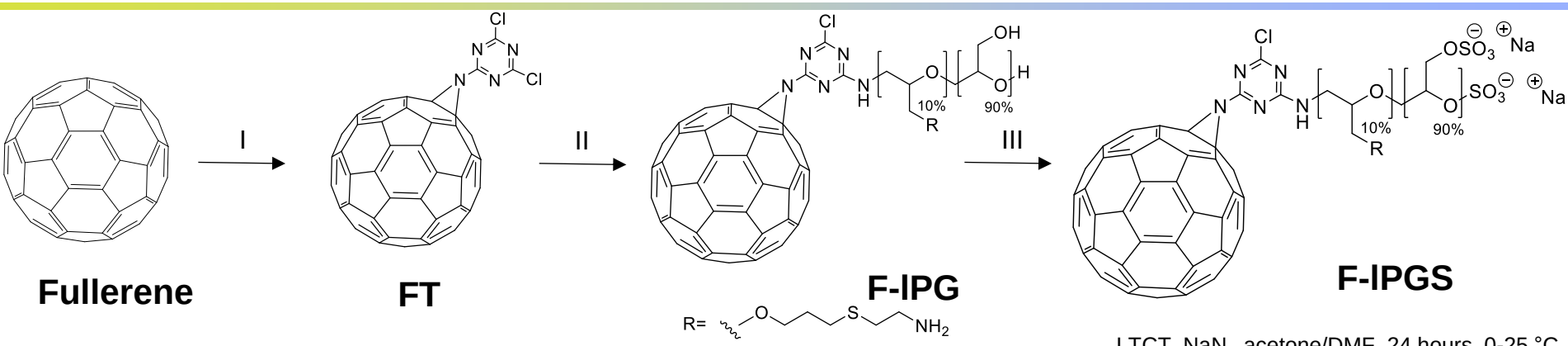


Bifunktionalisiertes Nanographen

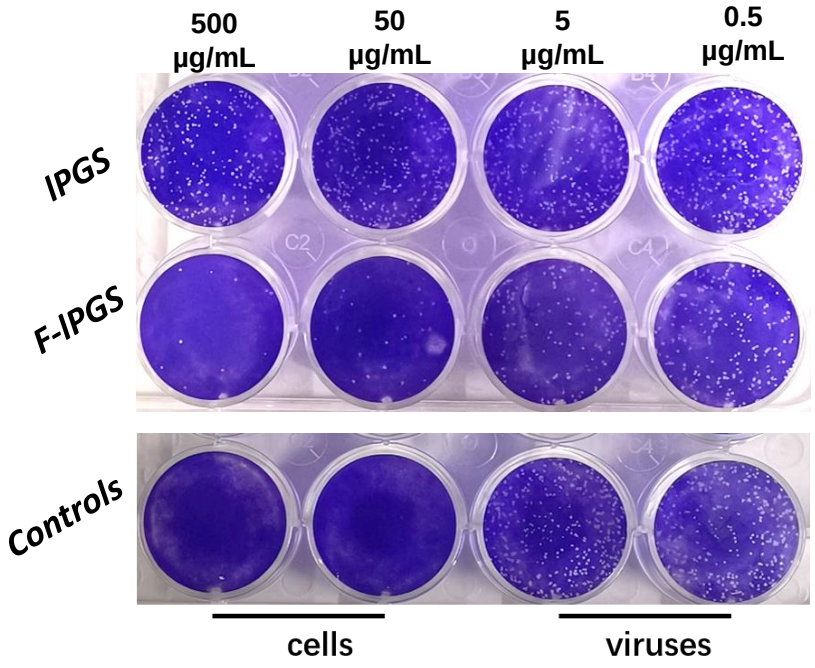


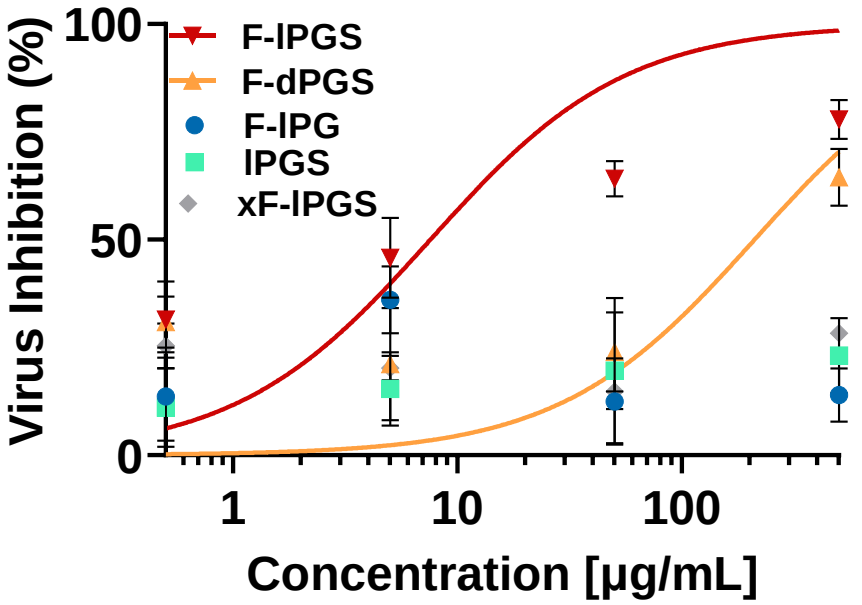
I. Donskyi* *et al., Small*, **2021**, 17, 2007091

Examples of done projects



I TCT, NaN_3, acetone/DMF, 24 hours, 0-25 °C
II lPG, DMF, TEA, 24 hours, 25 °C
III NH_3*SO_3, DMF, 24 hours, 60 °C





T. Page, **I. S. Donskyi***, et al., *Small*, **2023**, 19, 2206154