



INSTITUTE OF BIOORGANIC CHEMISTRY

Polish Academy of Sciences

Paweł Zmora, PhD

Head of the Department of Molecular Virology

Research interests



Novel antiviral strategies

MONITORING

Diagnostic tests development

SARS-CoV-2 infection seroprevalence

Wastewater-based epidemiology

PREVENTION

Analysis of the population immunity

Novel vaccines development

TREATMENT

Novel drugs development

Development of the first Polish diagnostic test for the SARS-CoV-2 infection

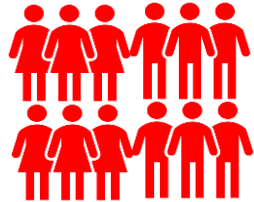
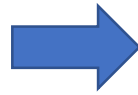


	Bosphore 2019-nCoV	Viasure SARS-CoV2 RT-PCR	DiaPlexQ™ 2019-nCoV	GeneFinder COVID-19 Plus RealAmp	Liferiver 2019-nCoV Multiplex RT-PCR	Vazyme 2019-nCoV RT-qPCR	Vitassay qPCR SARS-CoV2	MediPAN 2G+ FAST COVID
<i>Manufacturer (country of origin)</i>	Anatolia Geneworks (Turkey)	CerTest BIOTEC (Spain)	SolGent (Korea)	OSANG Healthcare Co., Ltd (Korea)	ZJ Bio-Tech (China) Obelis (Belgium)	Nanjing Vazyme Medical Technology (China)	Vitassay Healthcare (Spain)	Medicofarma/ IBCH PAS (Poland)
<i>Detection limits (virus copies/ml)</i>	519	≥500	200	500	1000	200	≥500	200
<i>Reaction time</i>	1h 27min	1h 44min	1h 48min	1h 56min	1h 11min	1h 28min	1h 39min	1h 3min

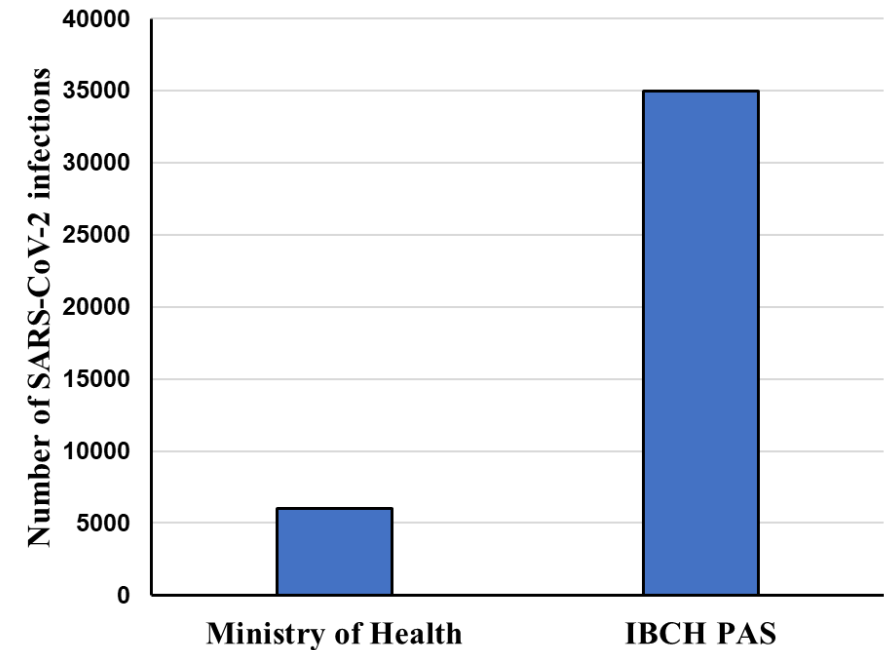
„True’ scale of COVID-19 pandemic



1500 ELISA tests



14 volunteers with
anti-SARS-CoV2
IgG antibodies



Wastewater-based epidemiology

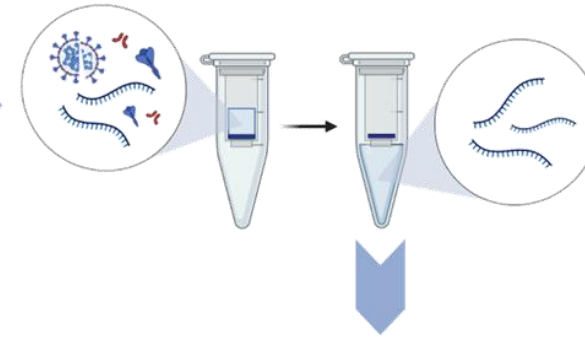
COVID-19 prevalence



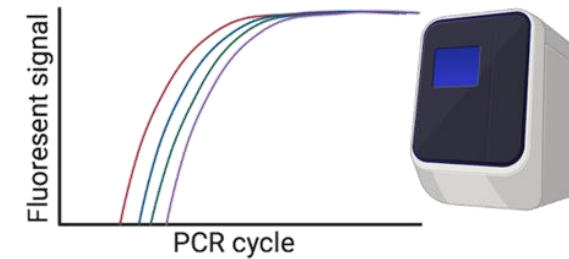
Virus concentration



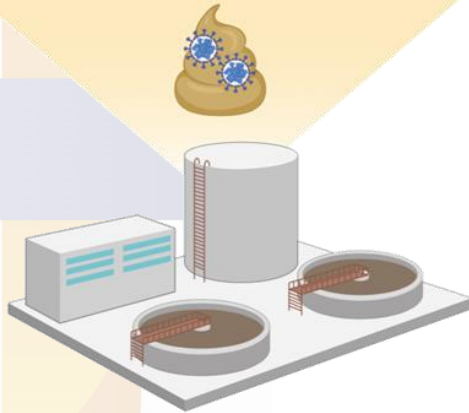
Viral RNA extraction



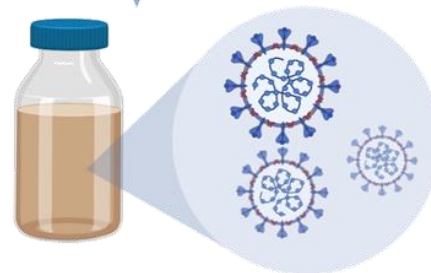
Quantitative PCR



Wastewater treatment plant

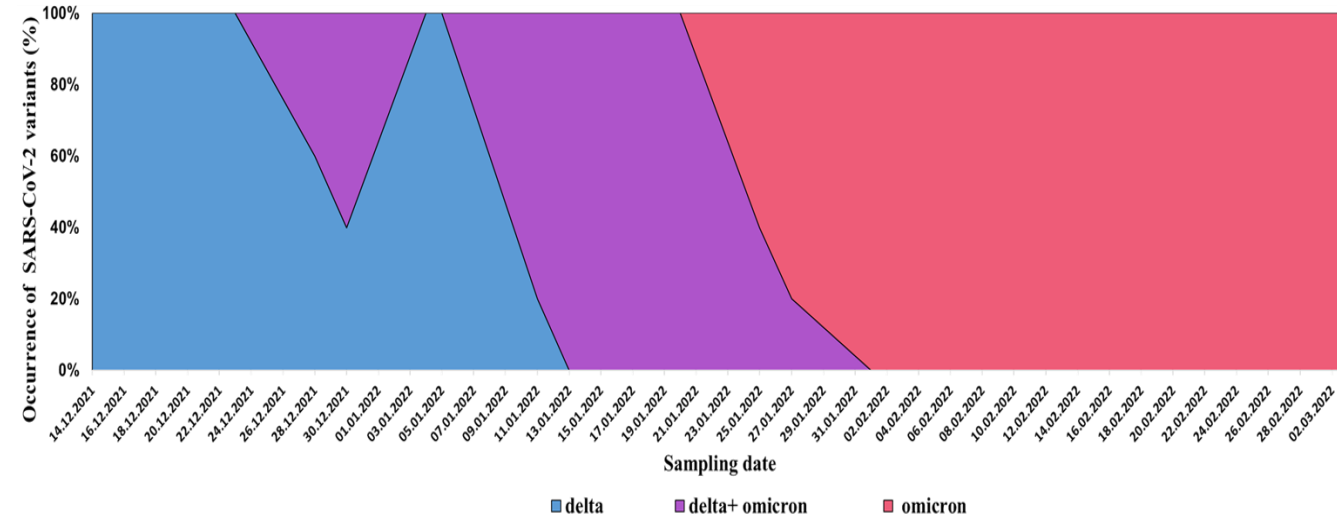
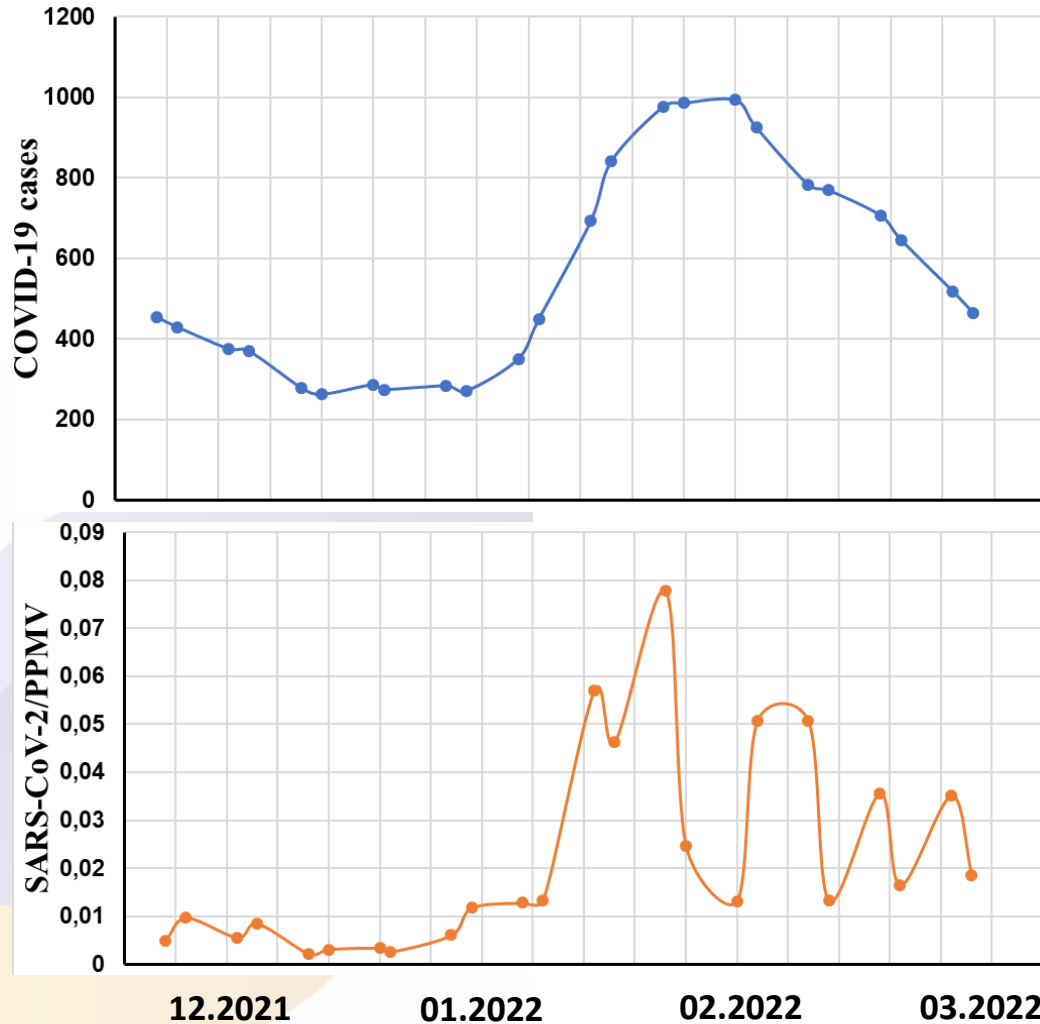


SARS-CoV-2 in wastewater

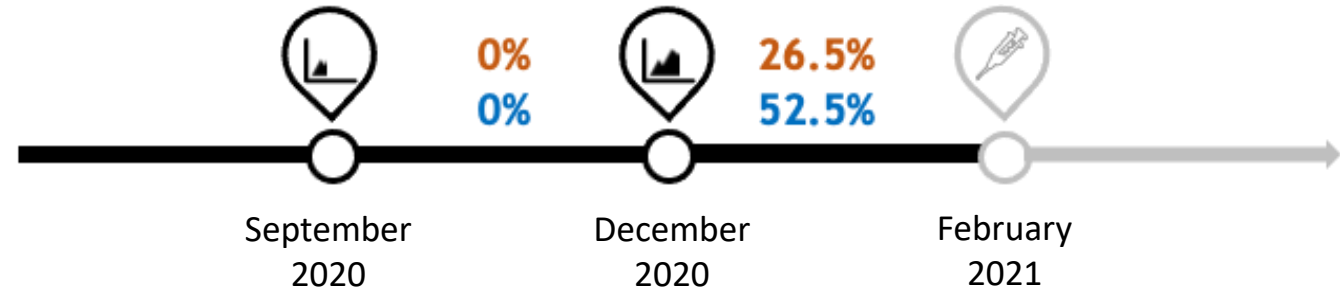


Detection & quantification of
SARS-CoV-2 RNA

The SARS-CoV-2 presence in the Poznan sewage system



SARS-CoV-2 seroprevalence among healthcare workers



High-risk
work
environment



Low-risk
work
environment

Seropositivity (anti-SARS-CoV-2 IgG)



31.3%

50%

24%

62.1%

22%

0%

Level of anti-SARS-CoV-2 IgG

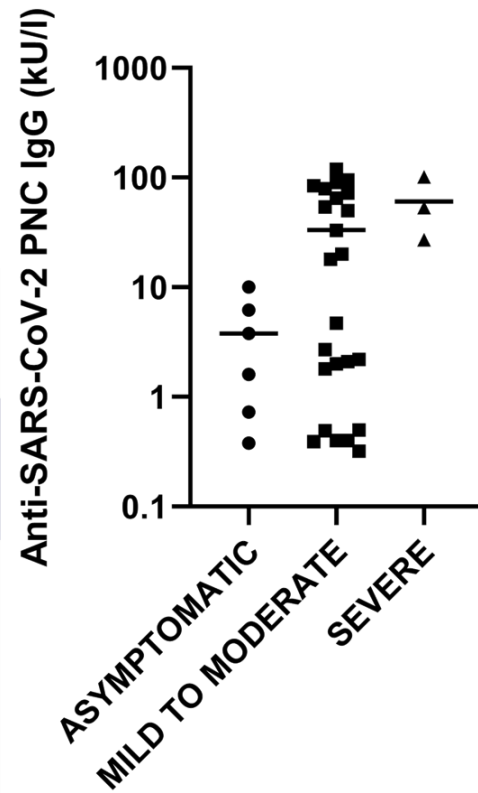
- no significant differences



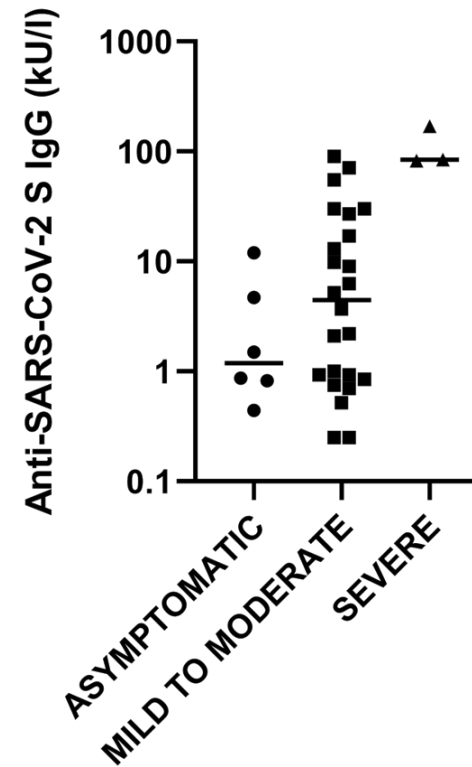
- significant differences



The anti-SARS-CoV-2 antibody level after the infection



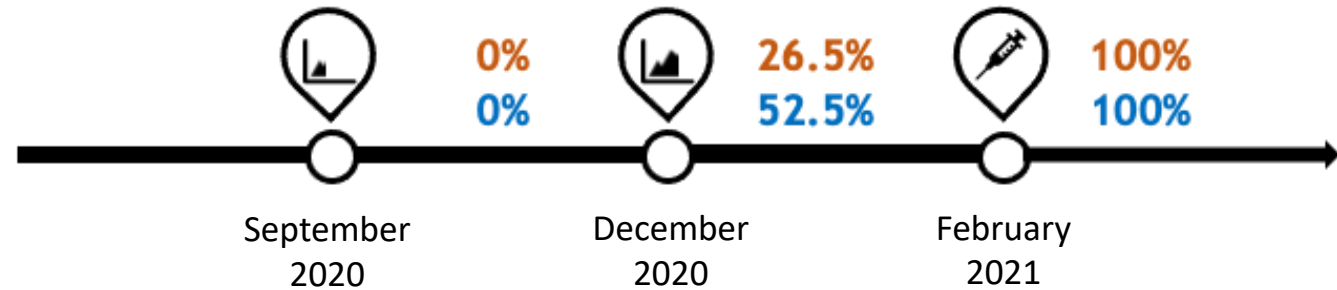
course of SARS-CoV-2 infection



course of SARS-CoV-2 infection

Lorent D., *et al.*, Vaccines, in review

SARS-CoV-2 seroprevalence among HCWs



Seropositivity (anti-SARS-CoV-2 IgG)

- 100 % after two doses of the Pfizer-BioNTech mRNA vaccine

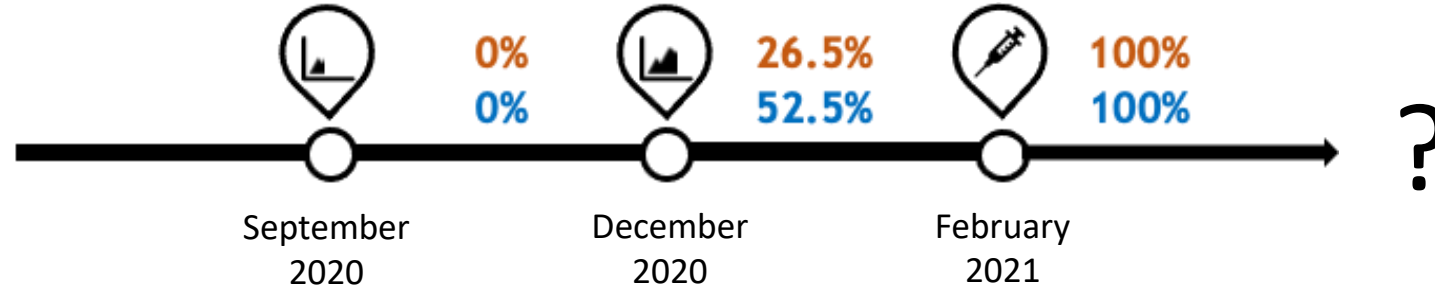


High-risk
work
environment



Low-risk
work
environment

SARS-CoV-2 seroprevalence among HCWs



High-risk
work
environment



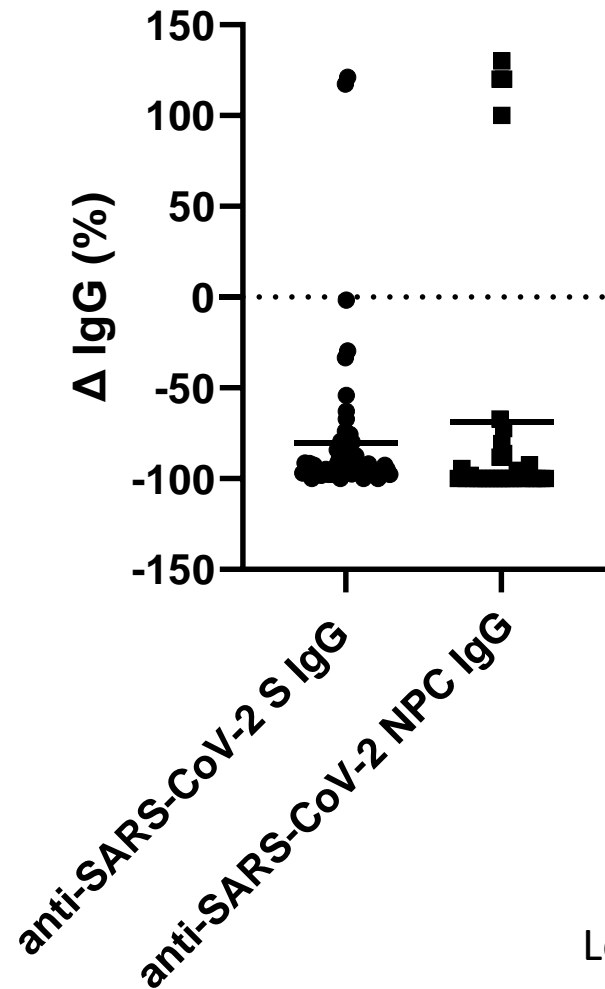
Low-risk
work
environment

	DIDaCP ¹	OGW ²
Anti-S	94.4%	94.1%
Anti-NCP	5.7%	36.7%

¹Department of Infectious Diseases and Child Neurology PUMS, Poznan

²Obstetrics and Gynecology Ward, Września

Anti-SARS-CoV-2 antibody level six months after the vaccination



Proteolytic activation of emerging coronaviruses



Antiviral Research

Volume 100, Issue 3, December 2013, Pages 605-614



Review

Proteolytic activation of the SARS-coronavirus spike protein: Cutting enzymes at the cutting edge of antiviral research

Graham Simmons ^a, Pawel Zmora ^b, Stefanie Gierer ^b, Adeline Heurich ^b, Stefan Pöhlmann ^b



RESEARCH ARTICLE

TMPRSS2 Isoform 1 Activates Respiratory Viruses and Is Expressed in Viral Target Cells

Pawel Zmora, Anna-Sophie Moldenhauer, Heike Hofmann-Winkler, Stefan Pöhlmann*

JBC ARTICLE



TMPRSS11A activates the influenza A virus hemagglutinin and the MERS coronavirus spike protein and is insensitive against blockade by HAI-1

Received for publication, January 17, 2018, and in revised form, June 15, 2018. Published, Papers in Press, July 5, 2018, DOI 10.1074/jbc.RA118.001273

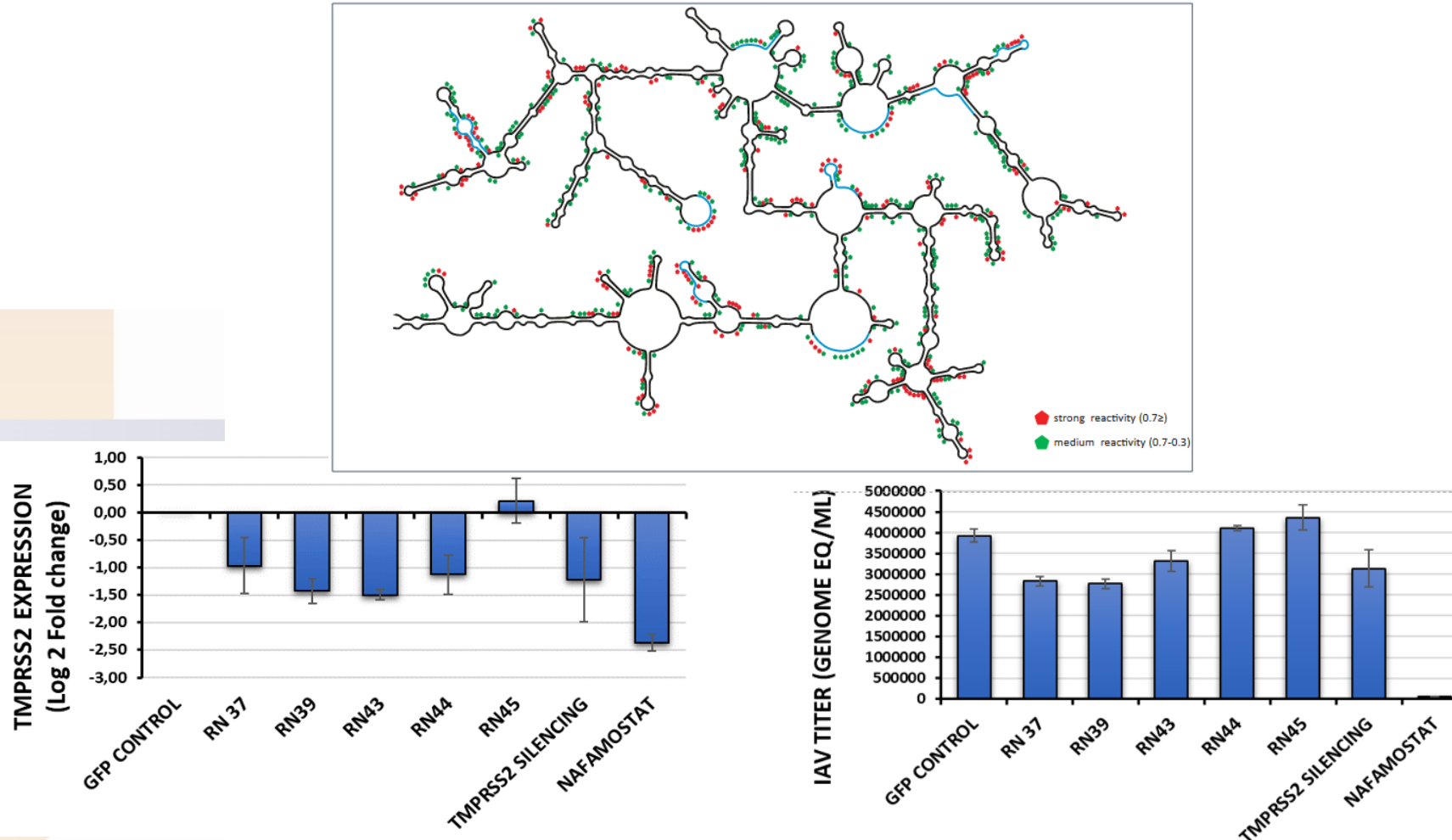
Pawel Zmora ^{†1}, Markus Hoffmann [†], Heike Kollmus [§], Anna-Sophie Moldenhauer [†], Olga Danov [¶], Armin Braun [¶], Michael Winkler [†], Klaus Schughart ^{§***††}, and Stefan Pöhlmann ^{††‡}



DESC1 and MSPL Activate Influenza A Viruses and Emerging Coronaviruses for Host Cell Entry

Pawel Zmora, ^a Paulina Blazejewski, ^a Anna-Sophie Moldenhauer, ^a Kathrin Welsch, ^{ab} Inga Nehlmeier, ^a Qingyu Wu, ^b Heike Schneider, ^c Stefan Pöhlmann, ^a Stephanie Bertram ^{ab}


Antiviral activity of the TMPRSS2 mRNA secondary structure-based ASOs



Science popularization – media expert



CENTRUM NAUKI KOPERNIK **PAN** **Wieczory dla dorosłych** odkrywa **SAMSUNG**
POLSKA AKADEMIA NAUK

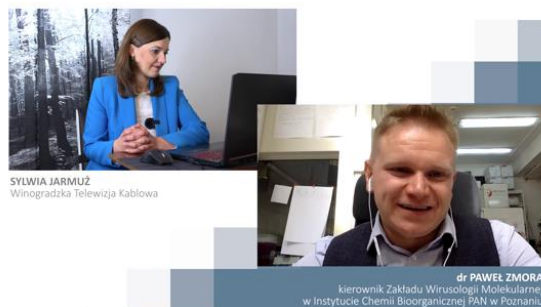


Testy na COVID-19

dr Paweł Zmora

Koronawirus na celowniku

9 czerwca 2021 godz. 19.00



SYLWIA JARMUŻ
Winogradzka Telewizja Kablowa

dr PAWEŁ ZMORA
kierownik Zakładu Wirusologii Molekularnej
w Instytucie Chemii Bioorganicznej PAN w Poznaniu



Cezary Odrzygóźdź - KR D

Paweł Zmora

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- Dr Szymon Nowak
- Prof. dr hab. Jerzy Stefaniak

- Dr Łukasz Kuszel

- Prof. dr hab. Magdalena Figlerowicz

Września District Hospital

- Prof. dr hab. Magdalena Pisarska-Krawczyk

WCMP



- Katarzyna Wysocka
- Danuta Kuczmińska



- Prof. Stefan Pöhlmann, PhD
- Markus Hoffmann, PhD



Thank you for your attention!

A large, semi-transparent version of the stylized 'P' logo from the IBCH PAS logo, positioned on the left side of the slide.