

ISSN 1028-0987



D.K. ZABOLOTNY

MICROBIOLOGICAL
JOURNAL

2022

VOL. 84

Founders

National Academy of Science of Ukraine

D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine

National University of Life and Environmental Science of Ukraine

Editor-in-Chief

V.S. PIDGORSKYI (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)

Deputy Editor-in-Chief

L.M. LAZARENKO (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)

Executive Secretar

A.Yu. CHOBOTAROV (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)

Editorial Board

L.V. AVDEEVA (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)

R.V. BUBNOV (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)

I.G. BUDZANIVSKA (Taras Shevchenko National University of Kyiv, Kyiv, Ukraine)

O. GOLUBNITSCHAJA (Universitätsklinikum Bonn, Bonn, Germany)

O.M. GROMOZOVA (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)

S.O. HNATUSH (Ivan Franko National University of Lviv, Lviv, Ukraine)

G.O. IUTYNSKA (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)

V.O. IVANYTSIA (Odesa Mechnikov National University, Odesa, Ukraine)

S.I. KLYMNYUK (I. Horbachevsky Ternopil National Medical University, Ternopil, Ukraine)

M.V. KRIVTSOVA (Uzhhorod National University, Uzhhorod, Ukraine)

G. KUNZE (Leibniz Institute of Plant Genetics and Crop Plant Research, Gatersleben, Germany)

I.K. KURDYSH (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)

B.P. MATSELYUKH (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)

K. NIEMCZUK (National Veterinary Research Institute, Pulawy, Poland)

L.A. PASICHNYK (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)

V.P. PATYKA (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)

T.P. PIROG (National University of Food Technologies, Kyiv, Ukraine)

O.M. REVA (University of Pretoria, Pretoria, South Africa)

A.V. RUDENKO (Institute of Urology, NAMS of Ukraine, Kyiv, Ukraine)

S.L. RYBALKO (Gromashevsky Institute of Epidemiology and Infectious Diseases, NAMS of Ukraine, Kyiv, Ukraine)

L.A. SAFRONOVA (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)

I.S. SHCHERBATENKO (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)

V.P. SHYROBOKOV (Bohomolets National Medical University, Kyiv, Ukraine)

L.M. SKIVKA (Taras Shevchenko National University of Kyiv, Kyiv, Ukraine)

A. SPIERS (Abertay University, Dundee, United Kingdom)

M.Ya. SPIVAK (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)

B.T. STEGNIY (Institute of Experimental and Clinical Veterinary Medicine, Kharkiv, Ukraine)

A.A. SYBIRNY (Institute of Cell Biology, NAS of Ukraine, Lviv, Ukraine)

O.B. TASHYREV (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)

E.I. TOVKACH (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)

V.V. VOLKOHON (Institute of Agricultural Microbiology and Agro-Industrial Production, NAAS of Ukraine, Chernihiv, Ukraine)

G. WEGRZYN (University of Gdansk, Gdansk, Poland)

V.I. ZADOROZHNA (Gromashevsky Institute of Epidemiology and Infectious Diseases, NAMS of Ukraine, Kyiv, Ukraine)

S.D. ZAGORODNYA (D.K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine)