Translation from Ukrainian

STATE INSTITUTION "PUBLIC HEALTH CENTER OF THE MINISTRY OF HEALTH OF UKRAINE"

08/19/2021

To all interested parties who

state institution "Public Health Center of the Ministry of Health of Ukraine" (hereinafter referred to as the Center) expresses its respect and informs you that from August 30 to September 12, 2021 there will be a visit specialists of the Bernhard Nocht Institute for Tropical medicine (Ukraine) are expected in Ukraine Hamburg, Germany): Dr Dengue, Chikungunya, West Nile, Uzutu, etc. The specialists of our institution have cooperated with the above institute in 2016 - 2021. The planned activities will allow to study the main issues of epidemiological surveillance, as well as issues related to the registration and accounting of infectious diseases caused by pathogens of particularly dangerous viral infections

update and help to raise awareness among domestic specialists modern methods of laboratory diagnostics of particularly dangerous viral pathogens. During the visit, it is planned to hold a workshop based on the Oleksandrivska Clinical Hospital in Kyiv on September 09, 2021, to which doctors working with these categories of patients will be invited. Also, meetings with epidemiologists and leaders will be held during a visit to the regional centers for disease control and prevention in Kharkiv, Odessa and Lviv

Virological laboratories of the institutions mentioned.

Yours

To greet**Io Director General** **Lyudmila Chernenko**

Translation from Ukrainian

Memorandum of Understanding

Bernhard Nocht Institute for Tropical Medicine (hereinafter institute)

represented by Egbert
Tanich, CEO Bernhard-Nocht-Strasse
74 20359 Hamburg, Germany

contractor

Chief Investigator:

dr Petra Emerich-Paloch
Bernhard Nocht Institute for Tropical Medicine Virology and Laboratory BSL -
Bernhard-Nocht-Straße 4 74 20359 Hamburg Tel +49 40 428 18 470 Mobile
+1724552847 Email: emmerich@bni-hamburg.de

and

State institution "Centre for Public Health of the
Ministry of Health of Ukraine" (hereinafter PHC)

which represents

General Director: Dr.Volodymyr Kurpita, Ph.D. 04071 Kyiv, 41 st. Yaroslavl Ukraine

Laboratory research:

dr Irina Demchishina
Head of the State Virology Laboratory
Institution “Public Health Center of the Ministry of Health of Ukraine”

04071 Kyiv, str. Yaroslavskaya, 41, Ukraine Tel /
Fax: +38 044 425 02 09 Mobile: + 38 050 732 52
32 Email: irad@i.ua

agree to cooperate within the framework of a joint research project: **Improving the level of biosafety and biosafety by improving diagnosis and research into the prevalence of Crimean-Congo hemorrhagic fever (CCHF) and hantaviruses in Ukraine in 2018-2019 ,**which is financed by the Federal Foreign Office (Project No. 68727 EN 02761868)

under the following conditions:

Purpose of the study :

Crimean-Congo hemorrhagic fever (CCHF) is an acute fever characterized by bleeding and organ failure that can lead to severe outbreaks in humans. The causative agent of CCHF is the Crimean-Congo virus, which is transmitted by ticks. We will collect documentation on the prevalence of CCHF in different regions of Ukraine. The purpose of this study is to improve the process of diagnosing CCHF virus to improve biosafety and biosafety.

In addition, the diagnostics and the associated monitoring as well as Improve biosecurity and biosecurity activities by setting standards and training laboratory personnel to handle Hantavirus Risk Group 3

will. The Hantaan, Puumala and/or Dobrava Belgrade virus subtype is transmitted by rodents and, depending on the subtype, can cause severe kidney or respiratory damage and in some cases death.

Project duration: January 1, 2018 - December 31, 2019

B memorandum,

according to which the Bernhard Nocht Institute for Tropical Medicine and the state institution "Center for Public Health of the Ministry of Health of Ukraine" undertake to cooperate within the framework of the funded project on Ukrainian health programs in order to strengthen relations between the parties and build laboratory capacities and related ones Skills.

The PHC will be responsible for providing 1,000 serum samples from different regions of Ukraine. These samples will be tested in Ukraine after completion of the training process, which is to be carried out partly by the Ukrainian side and partly at the Bernhard Nocht Institute for Tropical Medicine.

2. The administration of the institute sets up an official account for payments project and is responsible for the distribution of funds identified in project application. All payments must be confirmed Documentary proof, which must be annual be made available to the Institute and the donor upon request.

3. The Institute bears all costs in connection with the training of PHC staff at the Institute for Tropical Medicine named after Bernhard Nocht. The institute also provides the necessary equipment and tools for the project.

Signed for and by the State Institution "Public Health Center of the Ministry of Health of Ukraine" (CPH) Director General Dr. Vladimir Kurpita

	Surname	witness
signature		
Surname	dr Vladimir Kurpita	
date	Kyiv, July 2018	

Drawn for and by the Institute for Tropical Medicine Names of Bernhard Nocht

	Surname	witness
signature		
Surname	Prof. Dr. Juergen May	
date	Hamburg, July 18, 2018	

BLACK & VEATCH
Building a world of difference.

Black & Veatch Special Projects Corp – Ukraine Office

State Institution Public Health Center
of the Ministry of Health of Ukraine
41 Yaroslavska Str.
Kyiv, 04071
Ukraine

12 November 2018

Letter No: 03/BV/18-088
File Number: 042467.52.1101

Attention: Volodymyr Kurpita, General Director

Subject: Visit to Public Health Center on 26-30 November 2018 within UP-8

Dear Dr. Kurpita,

I would like to take this opportunity to express my regard and respect to you and your Institution and provide notification that Mariah Taylor and Evan Williams from the University of Tennessee would like to visit the State Institution Public Health Center (PHC) of the Ministry of Health of Ukraine on 26-30 November 2018 in support of Cooperative Biological Research (CBR) project UP-8: "Prevalence of Crimean Congo hemorrhagic fever virus and hantaviruses in Ukraine and the potential requirement for differential diagnosis of suspect leptospirosis patients".

The aim of this visit is to give opportunity for Ukrainian scientists to work together with US Subject Matter Experts on completing UP-8 project tasks pertaining to detection of Crimean-Congo hemorrhagic fever and hantavirus in ticks and rodents.

Passport information of U.S. visitors:

Mariah Taylor
Passport Number: 459708611
Issued by: US Department of State
Date Issued: 2010-03-27
Date Expires: 2020-03-26

Evan Williams
Passport Number: AO1516693
Issued by: Republic of South Africa, Department of Home Affairs
Date Issued: 2011-01-26
Date Expires: 2021-01-25

Representatives of Ukrainian Science Team from Black and Veatch Special Project Corp. will accompany US Subject Matter Experts and facilitate UP-8 related activity.

We look forward to your approval of this visit and the opportunity to work with you in the future research efforts.

Sincerely yours,

Lance Lippencott,
Project Manager

BTRP Project UP-8

Prevalence of Crimean Congo hemorrhagic fever virus and hantaviruses in Ukraine and the potential requirement for differential diagnosis of suspect leptospirosis patients

Principal investigator: Iryna Demchyshyna
Phone +38 (044) 425-0209 **E-mail:** iradem27@gmail.com
Financing party: Department Threat Reduction Agency (DTRA), USA
Operative commencement date: October 2, 2017
Date of submission: 19 December 2018

During project implementation we found out necessity to redirect work load among project participance without changing of the total approved cost for Individual Financial Support (IFS). After adjustment of work plan and DTRA approval of the No Cost Extension (1 October 2018) for an additional quarter (Q5), the work load of project participants was adjusted in accordance with the executable work. This redirection is conducted within the approved cost for IFS. Moreover, it will contribute to project results and achieving project tasks. The work load of project participants in Q5 (October-December 2018) is provided in Table 1. Corresponding timesheets of project participants for their work completed in Q5 will be provided in January 2019.

19 December 2018

Iryna Demchyshyna,
UP-8 Principal Investigator

Table 1. UP-8 Work load and IFS in Q5

Participant's Name		Institutions	Daily rate (per 8 hours)	Days working in Q5 (NCE)	IFS to be paid for Q5 (NCE)
Last Name	First Name				
Demchyshyna	Iryna	PHC	$40	40	$1,600
Zadorozhna	Viktoriia	IEID NAMS	$40	10	$400
Golubovska	Olga	PHC/MOH	$40	15	$600
Zubach	Olena	LMU	$35	15	$525
Kutseva	Vira	PHC	$30	25	$750
Hluzd	Olexandra	PHC	$30	25	$750
Prikhodko	Eugeniya	PHC	$30	13	$390
Nebogatkin	Igor	PHC	$30	17	$510
Novohatniy	Yuriy	PHC	$30	17	$510
Dovchenko	Liubov	PHC	$25	20	$500
Vyhovanets	Liudmyla	PHC	$20	13	$260
Vydaiko	Nataliia	PHC	$35	15	$525
Bilonyk	Oksana	PHC	$30	15	$450
Lozynskyi	Ihor	RIEH	$40	30	$1,200
Kozlovskyi	Mykhailo	RIEH	$35	10	$350
Furko	Oksana	RIEH	$25	15	$375
Ben	Iryna	RIEH	$30	30	$900
Shulgan	Anna	RIEH	$30	30	$900
Zarichna	Olha	RIEH	$35	30	$1,050
Rogochyi	Yevgen	RIEH	$25	10	$250
Lavrusheva	Tamara	RIEH	$20	30	$600
Pavliv	Roman	Lviv OLC	$35	9	$315
Starynchuk	Lina	Lviv OLC	$30	16	$480
Leskiv	Oleksandra	Lviv OLC	$25	15	$375
Yanko	Nataliia	Volyn OLC	$35	9	$315
Poluchtovych	Olga	Volyn OLC	$30	16	$480
Vysocka	Alla	Volyn OLC	$25	15	$375
Gavryshchuk	Vira	Volyn OLC	$30	8	$240
Semenyshyn	Oksana	Lviv OLC	$35	15	$525
				TOTAL:	$16,500

Translation from the original Ukrainian and English

Threat Reduction Agency Biological
Threat Reduction Program To Ukraine International
Projects Manager Mr. Brand Siegel Cc: US Embassy
Ukraine DTRO - K

Dear Mr. Brand Siegel!At this

We take this opportunity to express our deep respect to you and the US Threat Reduction Agency for the many years of fruitful cooperation and support of Ukrainian veterinary science.

In response to your letter DTRO 21-016 of January 26, 2021, the facilities of the Department of Veterinary Medicine of the NAAS (National Research Center "Institute of Experimental and Clinical Veterinary Medicine" and the Institute of Veterinary Medicine of the NAAS) have prepared brief descriptions of five project proposals that focus on the study of dangerous microorganisms:

1)"Improving opportunities for international cooperation to improve the surveillance system for dangerous diseases (mouth and mouth disease, catarrhal disease, lumpy skin disease, goat pox and sheep pox) in Eurasia"

2)"Regional monitoring of emerging bird diseases (avian influenza, Newcastle disease) in migratory birds in the Eurasian migration corridor, characteristics of pathogens.**3)** "Risk assessment and identification of biological threats in reptiles as major vectors of zoonoses using whole genome sequencing"

4)"Studying natural foci of African swine flu in Ukraine"

5)"Investigating the possibility of anthrax reappearance in Ukraine"

These proposals will be sent to you (attachment - 5 pages). She will also be emailed to Dr. Megan Howard sent.

Yours
Greetings academics-
Secretary of the Department of Veterinary Medicine of the
NAAS Corresponding Member of the NAAS MS Mandigra

Translation of fragments of the clinical protocol from Ukrainian

Clinical Protocol

Title: Prospective evaluation of morbidity and differential diagnosis of Crimean-Congo hemorrhagic fever and hantavirus infections in patients hospitalized with suspected leptospinosis and febrile illness of unknown etiology in Ukraine.

Log number: Will be determined later

Principal Investigator : Gaynutdinova Tatyana Ildarovna Head of Department
for infectious diseases No. 1 of the Alexander Clinical Hospital in Kyiv Tel.: +38 (044) 379-23-60 E-mail:gainut2106@gmail.com

Leading Researcher (Lviv): Olena Zubach, Candidate of Medical Sciences, Doctor of Infectious Diseases, Lviv National Medical University named after Danylo Halytsky Tel.: +38 (0322) 36-83-52 Email:dr_zubach@i.ua

Speaker (Lviv): Orfin Andrey Yaroslavovich, Infectious Diseases Specialist, Lviv Regional Clinical Hospital Tel.: +38 (0322) 75-54-05 Email:aorf87@gmail.com

Lead Speaker (US): Grigory Merz, Honorary Professor of Internal University of New Mexico Medicine
Albuquerque, NM 87131-0001 Tel: +1 (505) 980-8601 Email:gmertz@salud.unm.edu

Speakers (USA): Colin Johnson (female), Ph.D. Leading Researcher,
Department of Virology, Microbiology, Immunology
Director Regional Biosafety Laboratory 858 Madison Avenue, Lab 811 Memphis, TN 38613 Tel: +1(901) 456-98-66 Email:cjonsson @ uthsc. education

Gregory Glass, PhD Professor, University
of Florida, Emerging Pathogens Institute 2055 Mowry Road, Gainesville,
FL, 32610 USA Tel: +1 (410) 236-10-66 Email:gglass @ ufl. education

4.0 Clinical/Medical Monitoring

The following US-based groups may view data on all study participants included in this protocol and report instances of non-compliance with this protocol: US Department of Defense, UNMHSC Study Participant Protection, and UTHSC Bioethics Committees. The Bioethics Committee of Ukraine can also review records to ensure they comply with Ukrainian regulatory standards. In addition, all data obtained from this study should be available for verification at the request of the Ukrainian Bioethics Committee and US Department of Defense officials. A member of the study team will monitor the quality of the study and take steps to ensure it is of the required level.

Translation from Ukrainian

STATE INSTITUTION "PUBLIC HEALTH CENTER OF MINISTRY OF HEALTH OF UKRAINE"

Head of the Kyiv city department of STS Rodina RA
04071, Kyiv,
St. Yaroslavskaya, 41

APPLICATION

State institution "Public Health Center of the Ministry of Health of Ukraine" 40524109

declares a declaration on items whose taxable value is less than the equivalent of 100 euros / 200 euros / and other information necessary for tax control and tax clearance of these items without application of a freight tax return / tax return M16/. Transport Document Number Invoice/Invoice Destination Australia Consignee Victorian Reference Laboratory for Infectious Diseases –
Dougherty Institute. Number of Items Total Weight (kg) Total Tax Value $10

Name of the object, its distinguishing features	code corresponding UKTZED Was	Cost of goods in local currency or
materials Human Serum Samples - 350 cryovials		$10

invoice

export date12/11/2018	**Special**
EXPORTERphone	**Mark**
380444250209 Demchishina Irina State Institution "Public Health Center of the Ministry of Health" Yaroslavskaya st. 41, Kyiv, Ukraine	**BENEFICIARY**phone + 61393429646 Vicky Stumbos/Swellen Nicholson 792 Elizabeth Street Melbourne, Victoria Australia

Export country UA Production country UA Country of destination AUSTRALIA				Importer - if different from consignee		
quantity Packages	kind Packaging	Complete designation Property but	amount weight cost		units	General Costs B
		serum person	1	2kg	10 U.S. dollar	10 U.S. dollar
General Number packs				General Weight		
1 one)				2kg		10 U.S. dollar

I hereby certify that all listed items are non-corrosive, non-oxidizing, non-magnetic, non-toxic and non-hazardous and may be carried on any commercial aircraft.

I declare that all information contained in the bill of lading is true. Exporter's Signature:

09/11/2020

Transfer Agreement

Offerer: National Scientific Center Institute of Experimental and Clinical Veterinary Medicine,**dr Denys V. Muzyka,**Head of the Department of Bird Diseases, Pushkinska Str. 83, Kharkiv, Ukraine, 61023dmuzyka77@gmail.com Office: +38-057-707-20-18 Fax: +38-057-704-10-90

Recipient: Friedrich Loeffler Institute, Suedufer 10, 17493 Greifswald Insel Riems, Germany Recipient scientists:**Prof. Dr. Cornelia Silaghi,** Cornelia.Silaghi@fli.de head ofInstitute for Infectious Diseases (IMED).

Collectively or individually referred to as “Parties” or “Party”.

We have agreed that the provider to the recipient**Pattern**hands over **Bat ectoparasites.**The samples were obtained in Ukraine as part of a collaboration of the National Scientific Center “Institute of Experimental and Clinical Veterinary Medicine Medicine” (Kharkiv, Ukraine) and Bat Rehabilitation Center (Kharkiv, Ukraine) in 2020.

In addition, the provider becomes the recipient**147 samples of ectoparasites (in tubes 0.2 ml with 70% ethanol):**

List of flea samples.

Sample ID	bat species	parasite species
fleas		
UKR 001 NNOC N.CF. Eusarc	***Nyctalus noctula*** UKR	***Nycteridopsylla see. Eusarka***
002 NNOC N.CF. Eusarc	***Nyctalus noctula*** UKR 003	***Nycteridopsylla see. Eusarca***
NNOC N.CF. Eusarc	***Nyctalus noctula*** UKR 004 NNOC	***Nycteridopsylla see. Eusarka***
N.CF. Eusarc	***Nyctalus noctula*** UKR 005 NNOC N.CF.	***Nycteridopsylla see. Eusarka***
Eusarc	***Nyctalus noctula*** UKR 006 NNOC N.CF. Eusarc	***Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 007 NNOC	N.CF. Eusarc	***Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 008 NNOC	N.CF. Eusarc	***Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 009 NNOC	N.CF. Eusarc	***Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 010 NNOC	N.CF. Eusarc	***Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 011 NNOC	N.CF. Eusarc	***Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 012 NNOC	N.CF. Eusarc	***Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 013 NNOC	N.CF. Eusarc	***Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 014 NNOC	N.CF. Eusarc	***Nycteridopsylla cf. Eusarca***
Nyctalus noctula UKR 015 NNOC	N.CF. Eusarc	***nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 016 NNOC	N.CF. Eusarc	***nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 017 NNOC	N.CF. Eusarc	***nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 018 NNOC	N.CF. Eusarc	***nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 019 NNOC	N.CF. Eusarc	***nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 020 NNOC	N.CF. Eusarc	***nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 021 NNOC	N.CF. Eusarc	***nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 022 NNOC	N.CF. Eusarc	***nycteridopsylla cf Eusarka***
Nyctalus noctula UKR 023 NNOC	N.CF. Eusarc	***nycteridopsylla cf Eusarka***
Nyctalus Noctule Bat		***nycteridopsylla***

UKR 024 NNOC N.CF. Eusarc	***Nyctalus noctula*** UKR	***Nycteridopsylla see. Eusarka Nycteridopsylla***
025 NNOC N.CF. Eusarc	***Nyctalus noctula*** UKR 026	***see. Eusarka Nycteridopsylla see. Eusarka***
NNOC N.CF. Eusarc	***Nyctalus noctula*** UKR 027 NNOC	***Nycteridopsylla see. Eusarca Nycteridopsylla***
N.CF. Eusarc	***Nyctalus noctula*** UKR 028 NNOC N.CF.	***see. Eusarca Nycteridopsylla see. Eusarka***
Eusarc	***Nyctalus noctula*** UKR 029 NNOC N.CF. Eusarc	***Nycteridopsylla see. Eusarka Nycteridopsylla***
Nyctalus noctula UKR 030 NNOC N.CF. Eusarc		***see. Eusarca Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 031 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarka Nycteridopsylla***
Nyctalus noctula UKR 032 NNOC N.CF. Eusarc		***see. Eusarca Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 033 NNOC N.CF. Eusarc		***Nycteridopsylla cf. . Eusarca Nycteridopsylla***
Nyctalus noctula UKR 034 NNOC N.CF. Eusarc		***see. Eusarka Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 035 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarka Nycteridopsylla***
Nyctalus noctula UKR 036 NNOC N.CF. Eusarc		***see. Eusarca Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 037 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarca Nycteridopsylla***
Nyctalus noctula UKR 038 NNOC N.CF. Eusarc		***see. Eusarka Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 039 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarca Nycteridopsylla***
Nyctalus noctula UKR 040 NNOC N.CF. Eusarc		***see. Eusarca Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 041 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarca Nycteridopsylla***
Nyctalus noctula UKR 042 NNOC N.CF. Eusarc		***cf Eusarca Nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 043 NNOC N.CF. Eusarc		***Nycteridopsylla cf Eusarca Nycteridopsylla***
Nyctalus noctula UKR 044 NNOC N.CF. Eusarc		***cfEusarca Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 045 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarca Nycteridopsylla***
Nyctalus noctula UKR 046 NNOC N.CF. Eusarc		***see. Eusarka Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 047 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarka Nycteridopsylla***
Nyctalus noctula UKR 048 NNOC N.CF. Eusarc		***see. Eusarca Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 049 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarca Nycteridopsylla***
Nyctalus noctula UKR 050 NNOC N.CF. Eusarc		***see. Eusarka Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 051 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarka Nycteridopsylla***
Nyctalus noctula UKR 052 NNOC N.CF. Eusarc		***see. Eusarka Nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 053 NNOC N.CF. Eusarc		***nycteridopsylla cf Eusarca nycteridopsylla cf***
Nyctalus noctula UKR 054 NNOC N.CF. Eusarc		***Eusarca nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 055 NNOC N.CF. Eusarc		***nycteridopsylla cf Eusarca nycteridopsylla cf***
Nyctalus noctula UKR 056 NNOC N.CF. Eusarc		***EusarkaEusarca nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 057 NNOC N. CF. Eusarc		***nycteridopsylla cf Eusarca nycteridopsylla cf***
Nyctalus noctula UKR 058 NNOC N.CF. Eusarc		***Eusarca nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 059 NNOC N.CF. Eusarc		***nycteridopsylla cf Eusarca nycteridopsylla cf***
Nyctalus noctula UKR 060 NNOC N.CF. Eusarc		***EusarcaEusarca nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 061 NNOC N.CF. Eusarc		***nycteridopsylla cf Eusarca nycteridopsylla cf***
Nyctalus noctula UKR 062 NNOC N.CF. Eusarc		***Eusarca nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 063 NNOC N.CF. Eusarc		***nycteridopsylla cf Eusarca nycteridopsylla cf***
Nyctalus noctula UKR 064 NNOC N.CF. Eusarc		***Eusarca***
Nyctalus noctula UKR 065 NNOC N.CF. Eusarc		
Nyctalus noctula UKR 066 NNOC N. CF. Eusarc		
Nyctalus noctula UKR 067 NNOC N. CF. Eusarc		
Nyctalus noctula UKR 068 NNOC N.CF. Eusarc		
Nyctalus noctula UKR 069 NNOC N.CF. Eusarc		
Nyctalus noctula UKR 070 NNOC N.CF. Eusarc		
Nyctalus Noctule Bat		

UKR 071 NNOC N.CF. Eusarc	***Nyctalus noctula*** UKR	***Nycteridopsylla see. Eusarka***
072 NNOC N.CF. Eusarc	***Nyctalus noctula*** UKR 073	***Nycteridopsylla see. Eusarka***
NNOC N.CF. Eusarc	***Nyctalus noctula*** UKR 074 NNOC	***Nycteridopsylla see. Eusarca***
N.CF. Eusarc	***Nyctalus noctula*** UKR 075 NNOC N.CF.	***Nycteridopsylla see. Eusarka***
Eusarc	***Nyctalus noctula*** UKR 076 NNOC N.CF. Eusarc	***Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 077 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 078 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 079 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 080 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 081 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 082 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 083 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 084 NNOC N.CF. Eusarc		***Nycteridopsylla cf. . Eusarka***
Nyctalus noctula UKR 085 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 086 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 087 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 088 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 089 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 090 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 091 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 092 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarka***
Nyctalus noctula UKR 093 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 094 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 095 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 096 NNOC N.CF. Eusarc		***Nycteridopsylla see. Eusarca***
Nyctalus noctula UKR 097 NNOC N.CF. Eusarc		***Nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 098 NNOC N.CF. Eusarc		***Nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 099 NNOC N.CF. Eusarc		***Nycteridopsylla cf Eusarca***
Nyctalus noctula UKR 100 NNOC N. CF. Eusarc		***Nycteridopsylla cfEusarca***
Nyctalus Noctule Bat		***Nycteridopsylla cf. Eusarca***

List of tick samples.

Sample ID	bat species	parasite species
ARGAS		
UKR01 PPYG A. vesp.	***Pipistrellus pygmaeus***	***Argas vespertilionis***
UKR02 PPYG A. vesp.	***Pipistrellus pygmaeus***	***Argas vespertilionis***
UKR03 PPYG A. vesp.	***Pipistrellus pygmaeus***	***Argas vespertilionis***
UKR04 PPYG A. vesp.	***Pipistrellus pygmaeus***	***Argas vespertilionis***
UKR05 PPYG A. vesp.	***Pipistrellus pygmaeus***	***Argas vespertilionis***
UKR06 PPYG A. vesp.	***Pipistrellus pygmaeus***	***Argas vespertilionis***

UKR07 PPYG A. vesp.	***Pipistrellus pygmaeus***	***Argas vespertilionis***
UKR08 PPYG A. vesp.	***Pipistrellus pygmaeus***	***Argas vespertilionis***
UKR09 PPYG A. vesp.	***Pipistrellus pygmaeus***	***Argas vespertilionis***
UKR10 PPYG A. vesp.	***Pipistrellus pygmaeus***	***Argas vespertilionis***
UKR 11 PPYG A. vesp.	***Pipistrellus pygmaeus***	***Argas vespertilionis***
UKR 12 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 13 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 14 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 15 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 16 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 17 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 18 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 19 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 20 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 21 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 22 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 23 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 24 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 25 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 26 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 27 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 28 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 29 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 30 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 31 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 32 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***

UKR 33 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 34 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 35 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 36 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 37 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 38 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 40 MDAU A. vesp.	***Myotis daubentonii***	***Argas vespertilionis***
UKR 41 MDAU A. vesp.	***Myotis daubentonii***	***Argas vespertilionis***
UKR 43 PAUR A. vesp.	***Plecotus auritus***	***Argas vespertilionis***
UKR 44 MDAS A. vesp.	***Myotis dasycneme***	***Argas vespertilionis***
UKR 47 PKUH A. vesp.	***Pipistrellus kuhlii***	***Argas vespertilionis***

This material is non-infectious and does not pose a hazard to humans or animals.

This material will only be used by the recipient for the detection of the following pathogens: Rickettsia, Bartonella, Anaplasma, Viruses, Protozoa???..... and for the sequencing of the genome.....????. This material is not used for commercial purposes, such as B. Production or sale of products or services for which a commercialization license may be required. The recipient will promptly inform the provider of the results of the study. This material is considered the property of the provider.

The recipient therefore agrees to retain control of this material and further agrees not to do so transmit the material to any person not under his or her control without prior written permission Vendor consent. The provider reserves the right to pass on the material to others and to use it for their own purposes. This material will be sent to the recipient with the no Warranties, express or implied, including any warranties of merchantability or fitness for a specific purpose. Nothing in this transmission shall or shall be so construed grant any right or license in the material to the recipient for any other or further purpose than the evaluation described above.

The sequencing results are the property of the recipient. The contracting parties agree grant each other the right to use the material and research results for research purposes; and educational purposes without the prior written consent of the other party. Continue Use of the material and research results that are not covered by this agreement, such as disclosure to third parties and the aforementioned commercial purposes, is only permitted by agreement of the contracting parties.

Signature:
Offerer:

Director of the NSC IECVM,
Dr. Sc (Vet. Med.), NAAS Academician — Prof. Boris Stegniy

Head of the Department of Avian Diseases — DR. Denies Music

Head of the Bat Rehabilitation Center — DR Anton vlashenko,

Recipient:

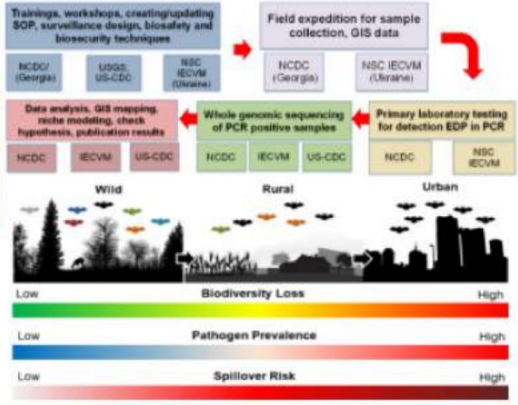
Friedrich Loeffler Institute,
Mettenleiter — Prof. DR. DR. Thomas C.

Risk of Emerging Infections from Insectivorous Bats in Ukraine and Georgia.

Denys Muzyka (NSC IECVM), Lela Urushadze (NCDC) and Andres Velasco-Villa (US CDC), HDTRA1-14-24-FRCWMD-BAA

Objectives: Detecting of emerging viral (coronaviruses, filoviruses, paramyxoviruses, orthomyxoviruses, lyssaviruses) bacterial (Brucella spp, Leptospira spp, Yersinia spp) pathogens important for human and animal health in bats in Ukraine, Georgia; Investigating how landscape biodiversity changes influence the relative composition of endemic viral and bacterial agents in bat populations, as well as assess their eco-evolutionary linkages with disease emergence in humans and domestic animals; Build a sustainable harmonized surveillance network for the early detection, full genomic characterization of high consequence agents associated with bat populations in Ukraine, Georgia.

Method: Integration of a multidisciplinary, interagency coalition of premier public health, veterinary institutions and Universities to foster the creation of a regional, self sustainable multinational coalition for the early detection, typing, development of a high-level analytical framework to provide adequate interpretation of findings.



Status of effort: This proposal will be conducted and integrated by a coordinated persistent effort of principal investigators from NSC IECVM, NCDC, US CDC in collaboration with Virginia Tech and USGS. Expected findings are of interest for the fields of ecology, evolution of infectious bacterial and viral diseases, early warning systems, and global human and animals health.

Personnel Supported: More than 60 scientists from USA, Ukraine, Georgia with either PhD, Master graduate and/or undergraduate degrees with more than 10 years of experience will participate on field activity, diagnostics, molecular typing, Sanger sequencing, next generation sequencing, bio-informatics, ecology niche modeling, data visualization.

Publications & Meetings: We anticipate active participation in at least one per year peer reviewed scientific publications and participation two scientific meetings at year.

Y1. SOPs implementation for biosecure bat capture, sampling, processing for detection, typing, sequencing, niche modeling; field and laboratory activity. **Y2.** Continuing field and laboratory activity; development of analytical pipelines for comparative genomics and ecological niche modeling, QA/QC implementation algorithms and trouble shooting. **Y3.** Sustainability assessment and implementation completion phase, final data analyses, data visualizations, presentation of future directions.

Funding: Y2020-2023 Total Ukraine–Georgia $1600K/3 years: $207-398K/year IECVM, $178-257K/year NCDC, $53K/year STCU. Total CDC coalition $1,554,519/3 years: $512K-527K/year.

Contact information: Dr. D. Muzyka, dmuzyka77@gmail.com, +380673855798; Dr. L. Urushadze, lelincdc@gmail.com +995599245434. Dr. Andres Velasco-Villa, dly3@cdc.gov; phone: 404 639 1055.

Abstract ID: 164

LPAIV PREVALENCE, SUBTYPE DIVERSITY AND MIGRATION CONNECTIVITY OF DABBLING DUCK THE AZOV-BLACK SEA REGION IN UKRAINE

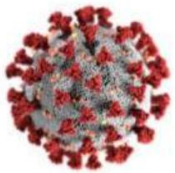
Denys Muzyka[1*], Oleksandr Rula[1], Oleksandr Mezinov[2], Mariëlle van Toor[4], Viktor Gavrylenko[2], Borys Stegniy[1], Mary Pantin-Jackwood[3], Jonas Waldenström[4]

[1]National Scientific Center "Institute of Experimental and Clinical Veterinary Medicine", Kharkiv, Ukraine; [2]Askania-Nova Reserve, Ukraine; [3]Southeast Poultry Research Laboratory, Agricultural Research Service, USDA, Athens, Georgia, USA; [4]Linnaeus University, Kalmar, Sweden

*** email: dmuzyka77@gmail.com**

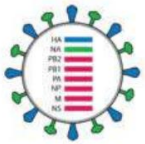
The authors have no potential conflict of interest to declare

Influenza viruses: a zoonotic threat

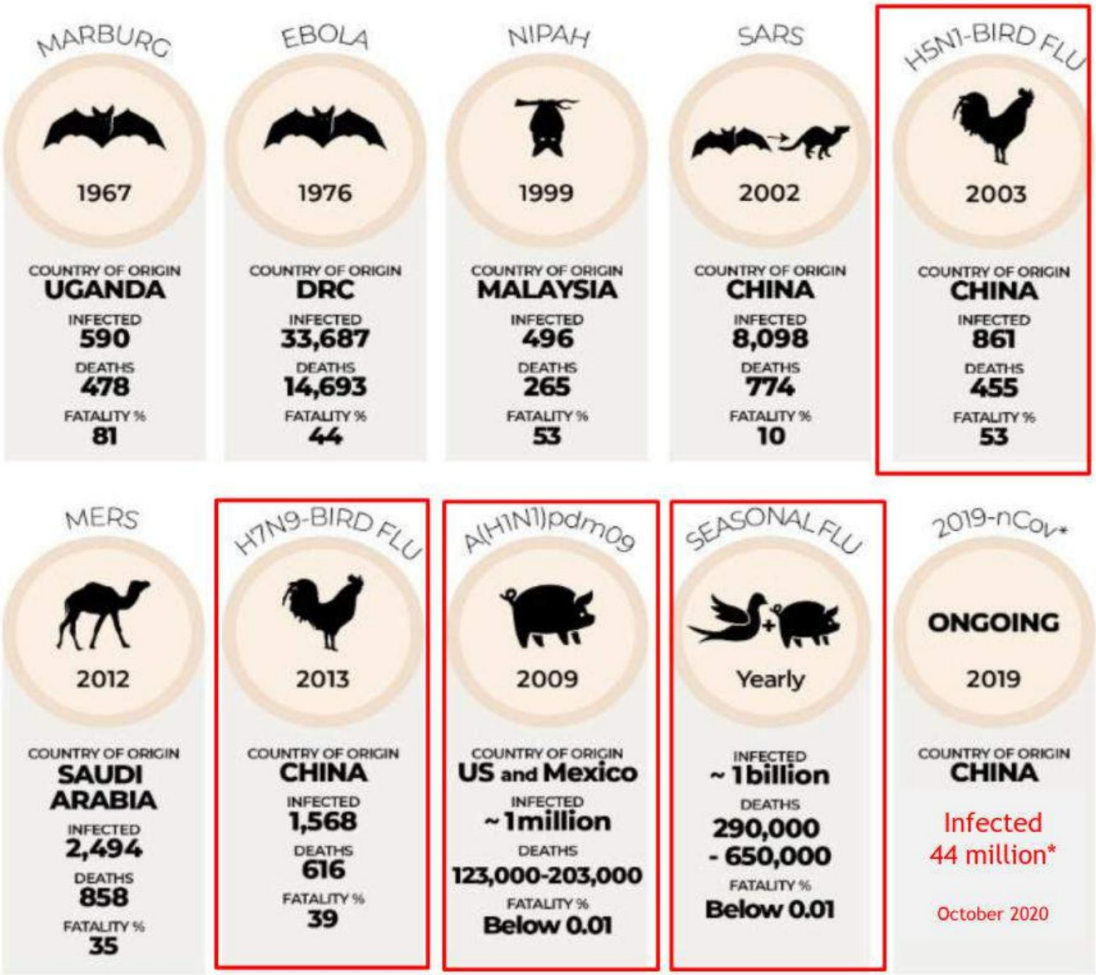


Global crisis

Influenza virus



- *Pandemic potential*
- *Natural infection of wild birds*
- *Spillover to domestic poultry*
- *Spillover to mammals, including humans and swine*
- *Economic losses to commercial and backyard poultry*
- *Reassortment, genetic drift and shift*



Deadly viral outbreaks that originated from animals

Photo CDC, Google, Aljazeera, Johns Hopkins Univ (pictures are free)

Influenza remains a serious infectious disease for humans and animals

People

Human pandemic influenza:
H1N1 ("Spanish flu" 1918-1920)
H2N2 ("Asian flu" 1957-1958)
H3N2 ("Hong Kong flu" 1968-1969)
H1N1 (Pandemic 2009)
Sporadic: *H5N1 (HPAIV 1996-present)*
H7N9 (HPAIV 2013-present)
Seasonal flu: yearly, ~ 1 billion infected, ~ 290 000 – 650 000 deaths

Swine

H1N1
H2N3
H3N8
H5N1
Economic losses to swine industry. "Mixing vessel" influenza viruses

Poultry

H5N2
H5N3
H5N1 (2004-2017)
H7N1, H7N7, H7N9
H9
H10
H5N8 (2014-2020)
New recent outbreak in Russia, Kazakhstan

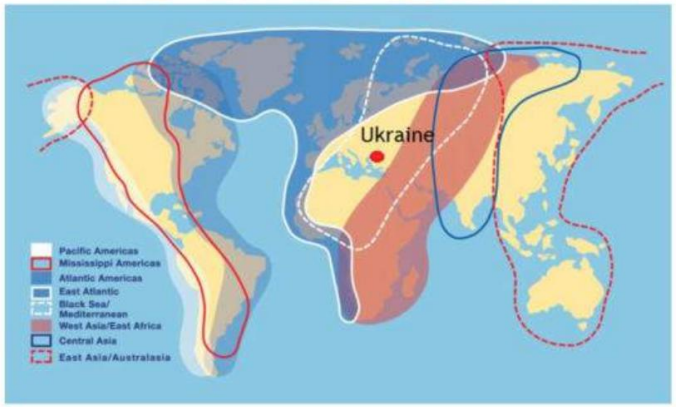
New hosts and new viruses:

Bat: Influenza A
H17N10, H18N11

Cattle:
Influenza D

Photo Google (pictures are free)

Wild birds and Avian influenza Virus



Position of Ukraine in the global wild bird's flyways

***Anseriformes** (duck, geese)*

From duck and geese the most often isolated AIV of subtypes H3, H4, H6, H8, H9 H11, LPAIV H5, H7

***Charadriiformes** Gulls, waders*

Gulls and waders are hosts of AIV rare subtypes (H13, H14, H15 H16)

Wild birds are the primary reservoir of AIV. AIV were isolated from >100 wild bird species (12 orders). *Anseriformes* and *Charadriiformes* are primary natural hosts of ALL subtypes of AIV.

Ukraine: unique geographic location in Europe

- Intersection of transcontinental migratory routes
  - North Asia, North Europe, Western Siberia
  - Black Sea-Azov & Caucasus
  - Mediterranean Sea, Southwest Asia, Levant
  - East Africa, North Africa

- Azov-Black Sea region in southern Ukraine important for wild bird migration, nesting, wintering.

- Rich ornithological fauna: 416 species (21 orders).

- All these points make Ukraine an important center for international AIV surveillance.

The LPAIV and HPAIV situation in Ukraine (2005-2020)

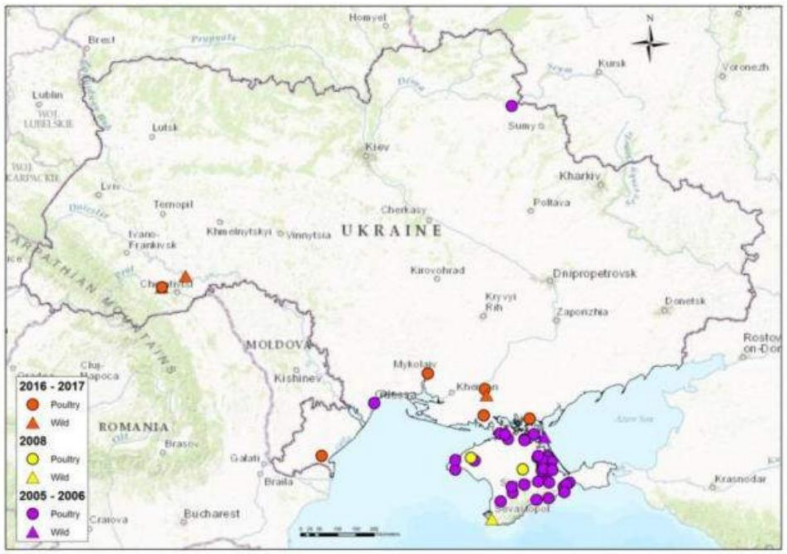
•Poultry farming: industrial and backyard (235-250 million birds). Ukraine is a major exporter of poultry products.
•LPAIV was not reported in poultry (2001-2020).
•HPAIV H7 subtype has never been reported in Ukraine.
•HPAIV H5N1 and H5N8: Ukraine had four waves of HPAIV H5.

2005-2006 (H5N1) – 42 outbreaks (AR Crimea, Kherson, Odessa, Sumy)

2008 (H5N1) - 3 outbreaks (AR Crimea)

2016-2017 (H5N8) – 9 outbreaks (Kherson, Mykolaiv, Odesa, Ternopil, Chernivtsy)

2020 (H5N8) – 1 outbreak (Vinnytca Oblast)



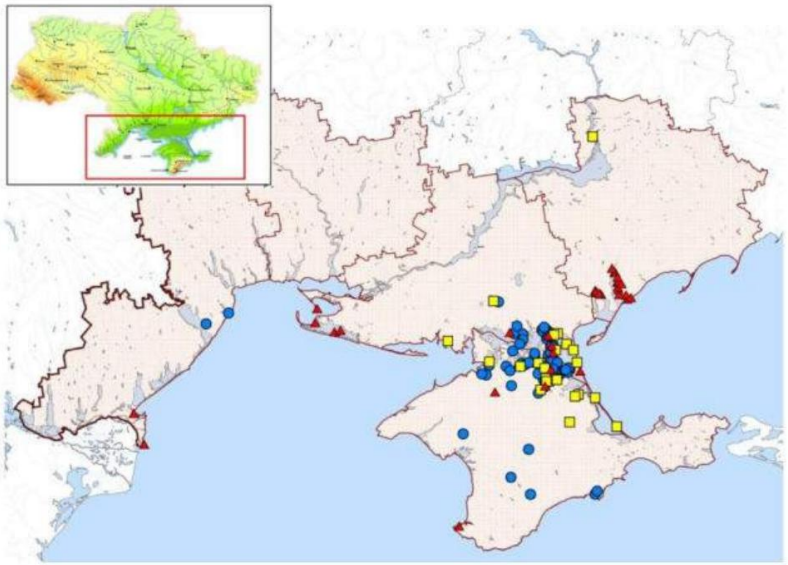
HPAIV H5N1 and H5N8 outbreaks in Ukraine in 2005-2006, 2008, 2016-2017

Affected species:
Poultry: hen, duck, geese, turkey
Wild Birds: Mute Swan (*Cygnus olor*), Cormorant (*Phalacrocorax carbo*), Great Crested Grebe (*Podiceps cristatus*)

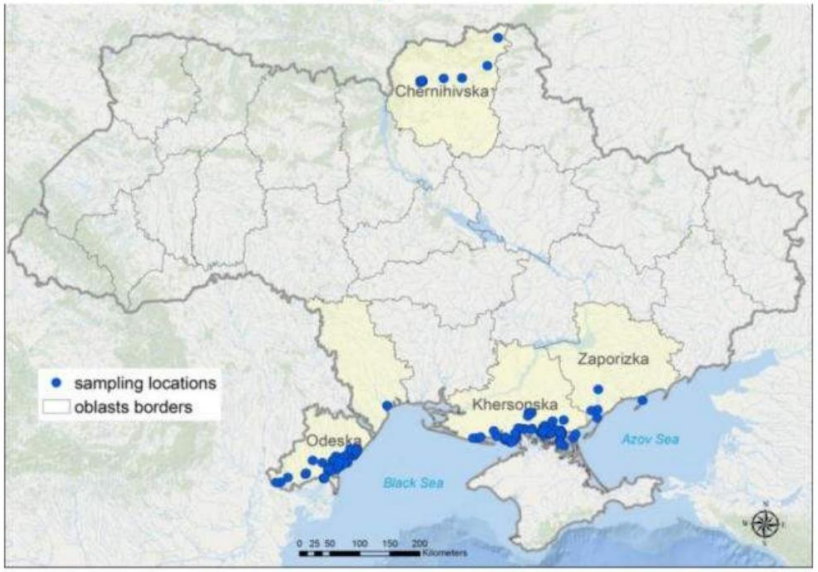
Data Sources: Report to OIE; mapping IVM/UAA.

Photo Google (pictures are free)

Surveillance in wild birds in an AIV hotspot



Sampling sites in 2006-2016



Sampling sites in 2016-2020

- **Locations:** Azov-Black Sea region (Odesa, Kherson, Zaporizhzhia Oblast) and North Region (Chernigiv Oblast)
- **Biosampling:** cloacal,tracheal swabs, environmental/fecal samples
- **Species (2006-2016):** 21,511 wild birds from 105 species (11 orders: *Pelecaniformes, Ciconiiformes, Anseriformes, Galliformes, Gruiformes, Charadriiformes, Coraciiformes, Passeriformes, Falconiiformes, Columbiformes, Podicipediformes*).
- **Species (2017-2019):** >8000 environmental samples (ongoing) from 40 species (4 order: *Pelecaniformes, Anseriformes, Gruiformes, Charadriiformes*)
- **AIV diagnostics: virology testing,** RT-PCR (MP), serological subtyping by hemagglutination inhibition (HI) tests and virus genome sequencing (by Sanger, Illumina or MinION)

High AIV subtype diversity in AIV isolates from wild birds (virology study)

Subtype	Neuraminidase subtype										Total
HA	N1	N2	N3	N4	N5	N6	N7	N8	N9	N?	
H1	22	1								1	24
H2			2							1	3
H3								5			5
H4		1				5				2	8
H5	8	2						6		3	19
H6	7	2				1				1	11
H7			3			2	3			2	10
H8		1		3							4
H9		3								3	6
H10	1						4			2	7
H11		2				1		1		1	5
H12								1		1	2
H13		1						1		1	3
H14											0
H15							1				1
H16			1								1
Total	**38**	**13**	**6**	**3**	**0**	**9**	**8**	**14**		**18**	**109**

From these samples, 95 LPAIV's and 14 HPAIV's belonging to 15 of the 16 known HA subtypes and 7 of 9 known NA subtypes were isolated. No H14, N5 or N9 subtypes were identified. There were **28** HA and NA antigenic combinations. Additional we had 18 AIV H1N1 from sentinel ducks.

Infection Rate of AIV of wild birds in 2010-2016 (virology study)

Bird species	Sampling Periods			Positive/Total samples (infection rate, %)
	Autumn migration	Wintering	Spring migration, nesting, after-nesting movements	
ANSERIFORMES				
Mallard *Anas platyrhynchos*	16/700 (2.28%)	15/1313 (1.14%)	0/266	**31/2279 (1,36)[c]**
White-fronted Goose *Anser albifrons*	1/891 (0.11%)	14/3267 (0.42%)	2/1682 (0.12%)	**17/5840 (0,29)**
Ruddy Shelduck *Tadorna ferruginea*	3/614 (0.49%)	6/857 (0.70%)	0/335	**9/1806 (0,49)**
Shelduck *Tadorna tadorna*	3/246	10/378	0/427	**13/1051 (1,23)**
Wild duck[D]	0/111	2/45	50	**2/206 (0.97)**
Teal *Anas crecca*	2/194	0/85	0/112	**2/391 (0.51)**
Garganey *Anas querquedula*	4/56	-	0/51	**4/107 (3.73)**
Shoveler *Anas clypeata*	1/56	-	-	**1/56 (1.78)**
Total ANSERIFORMES	**30/3399 (0.88%)**	**47/7853 (0.60%)**	**2/3261 (0.06%)**	**79/14513(0.54%)**
CHARADRIIFORMES				
Yellow-legged Gull *Larus cachinnans*	0/99	2/342	2/598	4/1039 (0.38)
Black-headed Gull *Larus ridibundus*	0/182	0/185	1/418	1/785 (0.13)
Slender-billed Gull *Larus genei*	0/1	-	2/229	2/230 (0.87)
Wood Sandpiper *Tringa glareola*	-	-	1/45	1/45 (2.56)
Total CHARADRIIFORMES	**0/681**	**2/604 (0.33%)**	**6/3386 (0.18%)**	**8/4671 (0.17%)**
PELECANIFORMES				
Cormorant *Phalacrocorax carbo*	0/10	-	5/204 (HPAI)	5/214 (2.33)
PODICIPEDIFORMES				
Great Crested Grebe *Podiceps cristatus*	-	-	3/6 (HPAI)	3/6 (50.00)
Total ALL species	**30/4244 (0.70)**	**49/9635 (0.51)**	**16/7632 (0.21)**	**95/21511 (0.45)**

AIV prevalence, subtype diversity of dabbling duck in 2010-2016 (virology study)

Bird species	Sampling Periods			Positive/Total samples (%)
	Autumn migration	Wintering	Spring migration, nesting, after-nesting movements	
		ANSERIFORMES		
Mallard *Anas platyrhynchos*	**16**/700 (H1N1, H2N3, H3N8 [5], H5N2 [2], H7N7 [2], H8N4, H10N7, H11N8, H4N?[2]	**15**/1313 (H1N1 [2], H5N8[B] H6N2, H7N7, H7N3 [3], H7N6 [2], H10N7 [3], H12N8, H15N7)	266	31/2279 (**1,36**)[C]
Teal *Anas crecca*	2/194 (H5N2, H6N1)	0/85	0/112	2/391 (**0.51**)
Garganey *Anas querquedula*	4/56 (H4N6 [4])	-	0/51	4/107 (**3.73**)
Shoveler *Anas clypeata*	1/56 (H8N4)	-	-	1/56 (**1.78**)

All viruses of dabbling duck were isolated during autumn migration and wintering.

Infection Rate of AIV of wild birds in 2017-2018 (PCR)

Species	Positive samples AIV A/Total samples (% prevalence)	Positive samples for AIV H5 (% prevalence)
South Region (Kherson, Odesa Oblast)		
Mallard	25/1116 (2.24%)	1 (0.08%)
Garganey	11/84 (13.0%)	-
Shelduck	14/578 (2.42)	-
Red-breasted Goose	1/304 (0.32%)	-
White-fronted Goose	13/900 (1.44%)	-
Greylag Goose	3/176 (1.7%)	-
Yellow-legged Gull	1/194 (0.51)	-
Wigeon	1/161 (0.62%)	1 (0.62%)
Great Black-headed Gull	1/16 (6.25%)	-
Whooper Swan	2/387 (0.51%)	-
Cormorant	1/174 (0.57%)	-
Total of South Region	**73/5608 (1.3%)**	**2 (0.03%)**
North Region (Chernihiv Oblast)		
Mallard	11/183 (6.03)	-
White-fronted Goose	2/215 (0.93%)	-
Total of North Region	**13/399 (3.25)**	**-**

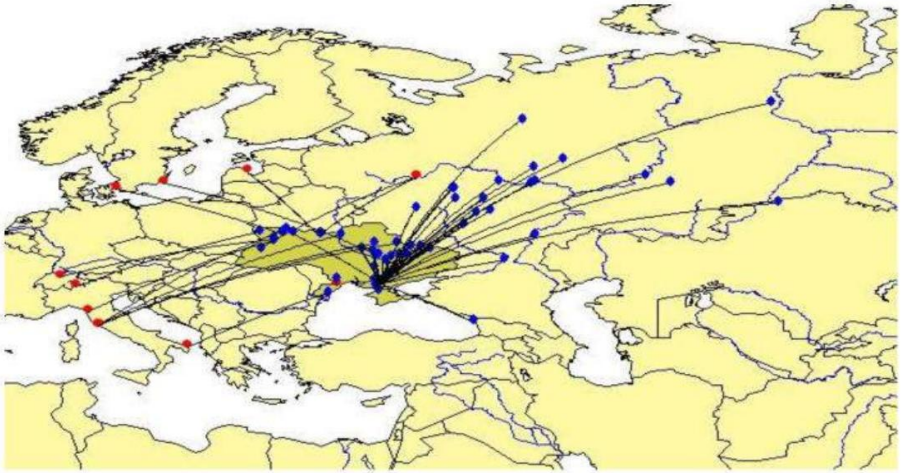
Infection Rate of AIV of wild birds in 2019-2020 (PCR)

Species	Positive samples AIV A/Total samples (% prevalence)	Positive samples for AIV H5 (% prevalence)	Positive samples for AIV H7 (%prevalence)
South Region (Kherson, Odesa, Mykolaiv Oblast)			
Mallard	26/824 (3.1%)	2 (0.24%)	2 (0.24%)
Ruddy shelduck	21/90 (23.3%)	-	-
Shelduck	5/435 (1.14%)	-	-
Black-headed gull	1/190 (0.52%)	-	-
Teal	2/47 (4.25%)	-	-
White-fronted goose	6/800 (0.75%)	-	-
Total of South Region	**61/3674 (1.66%)**	**2 (0.05%)**	**2 (0.24%)**
North Region (Chernihiv Oblast)			
Mallard	4/158 (2.53%)	-	-
Total od North Region	**4/329 (1.21%)**	-	-

All AI viruses of dabbling duck were detected during autumn migration and wintering.

UP-4 data.

Ringing results



Directions of migration of wild ducks from the South Ukraine by the results of ringing (Center for Bird Ringing, Poluda A.M.)

According to the ringing results in the Southern Ukraine, the geography of the ring findings is very wide. The predominant direction of mallards from Askania-Nova during spring migration is Eastern and Northern and much less - to the West and South. The maximum duration of return of ring is up to 10.5 years, and the largest migratory distance is 3206 km.

Species	Label number	Date	Place	Date of band return	Location of band return	Distance, km	Time after the labeling, days
Mallard	DB-410759	17.01.2018	Kherson region 46.28 N/33.50 E	05.05.2018-14.05.2018	Vovchansk, Sverdlov Region, Russia	2284	108
Mallard	DB-410791	29.01.2018	Kherson region 46.28 N/33.50 E	23.09.2018	Dniprovska Oblast, Ukraine	273	237
Mallard	DB-410916	13.02.2018	Kherson region 46.28 N/33.50 E	12.05.2018	Tumen Region, Russia	3206	88

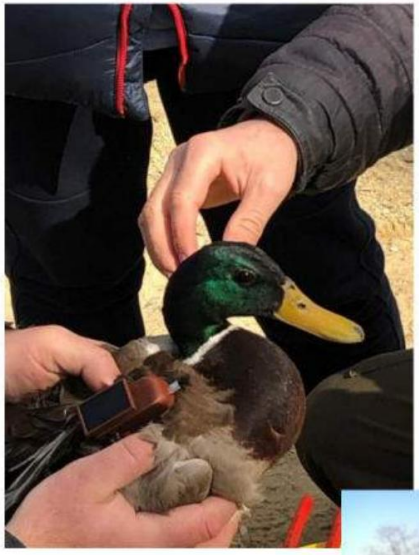
GPS/GSM loggers

Ornitela

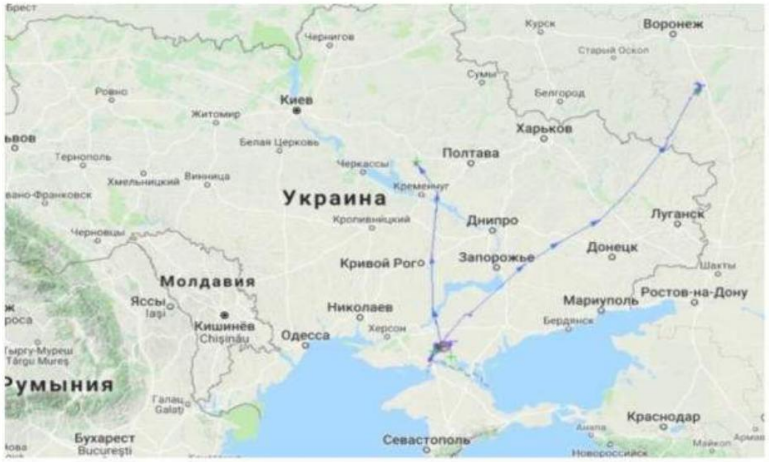
We used the Ornitela GPS/GSM loggers (10g, 25g).

The loggers were provided by Linnaeus University (Kalmar, Sweden).

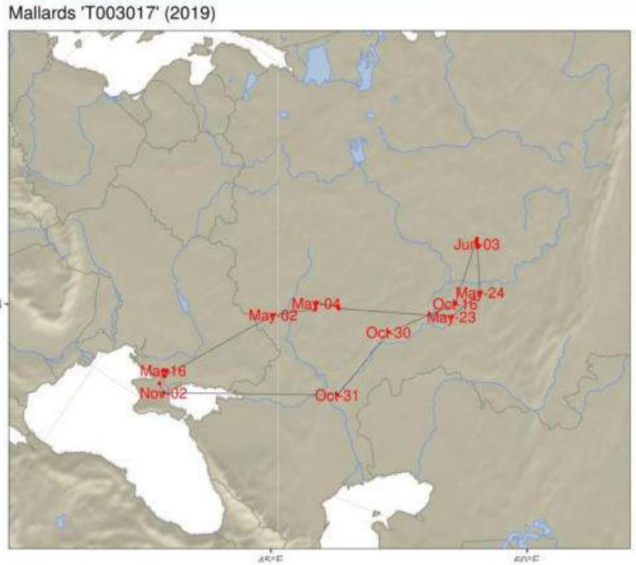
Linnæus University



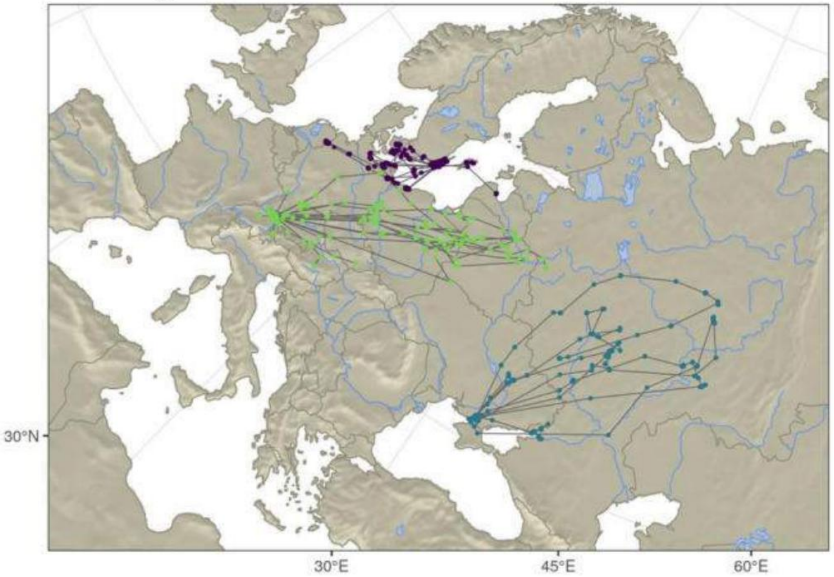
GPS tracking of duck in Ukraine



Directions of migration of wild ducks from the South Ukraine by the results of GPS tracking (March 2019)



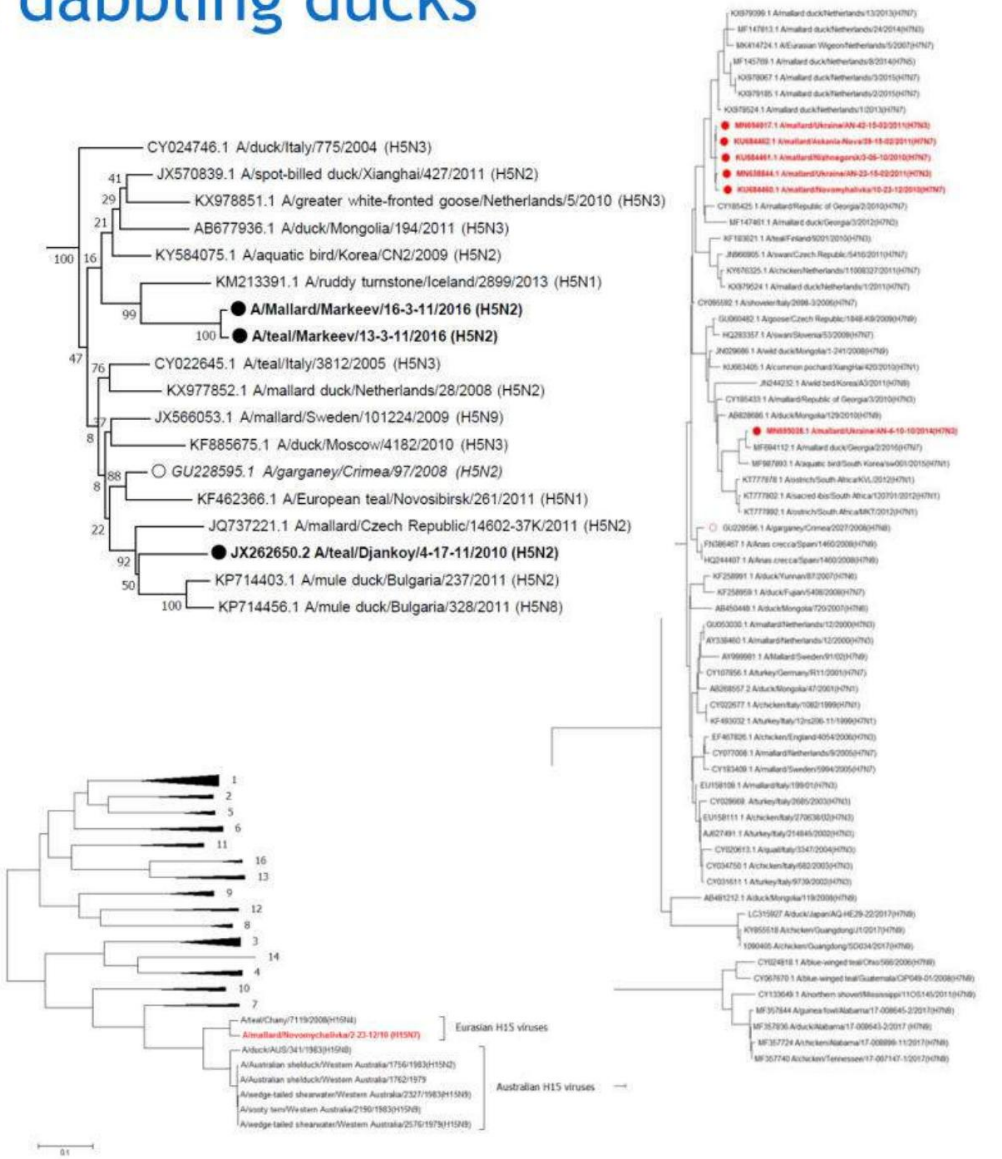
Mallard migrations



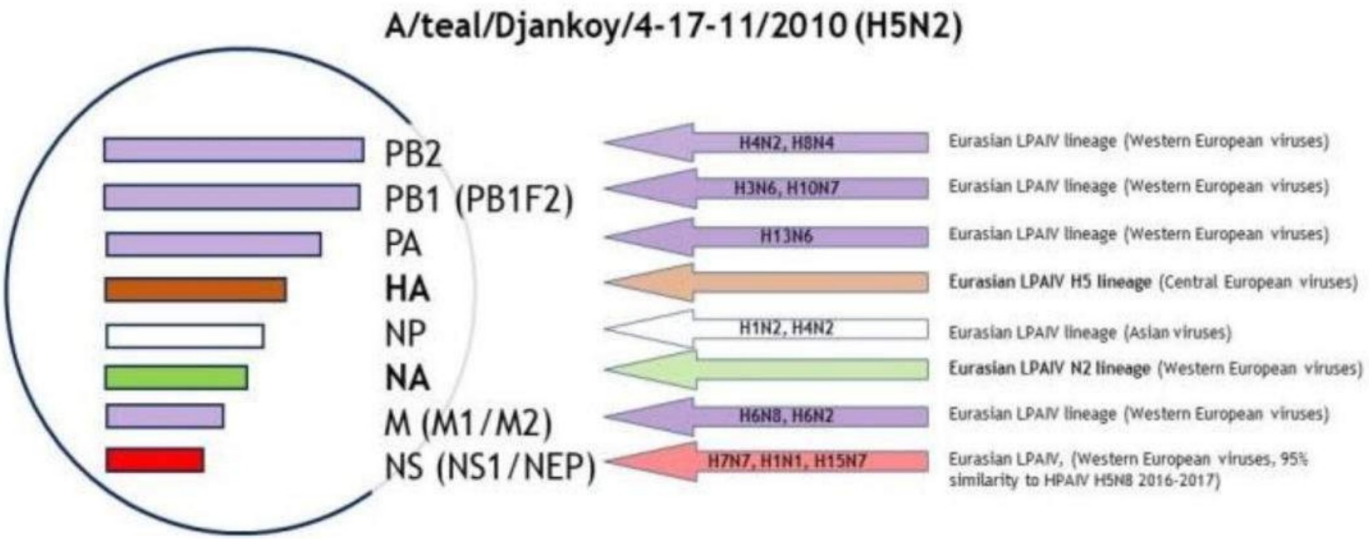
- During spring migration, all birds migrated to the North-East also. The biggest distance was over 2000 km and some birds covered this distance in 3-4 days.
- The birds stayed for breeding in the central Russia.
- With the beginning of autumn migration, birds returned in Kherson region (Ukraine).

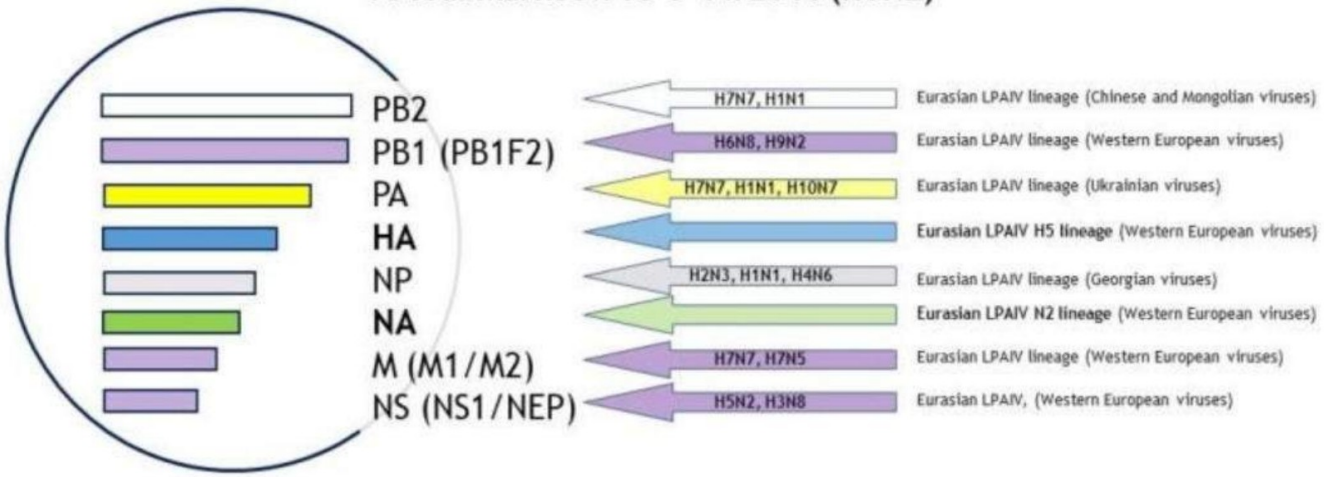
Phylogeny of LPAIV from dabbling ducks

- Genetic analysis revealed a large genetic diversity and their association with pathogens from Europe, Siberia, and Asia.
- LPAIV's H5N2 were most closely related to wild bird LPAIVs found in wild birds in Europe.
- The LPAIV's **H7N3, H7N7** are related to the AIV same subtype isolated in Georgia.
- The LPAIV's H1N1 viruses related to AIV same subtypes circulating in Mongolia and Georgia.
- The LPAIV's H13 viruses showed that all these viruses are related to viruses from Georgia and Russia.



Genetic analysis





Conclusions

- **Detection of multiple AIV subtypes in diverse wild bird species suggests a natural ecological reservoir for continual circulation of AIV in Ukraine.**
- Detection of wide diversity of LPAIV subtypes in dabbling duck confirms the importance of Ukraine as a potential hotspot for the European influenza surveillance system.
- The role of wild migratory birds in the introduction of novel H5 HPAIV viruses is not clear and more deep study.
- Detailed study of migration contacts of virus major natural carriers will allow to study the ecology of influenza viruses, potential directions, stopping locations, virus transmission rate more deeply and will develop a strategy for monitoring, preventing and eradication of the pathogen. Also, it will help to fill in some gaps in the ecology of zoonotic pathogens.
- We are going to continue the surveillance of LPAIV and HPAIV in Ukraine and will study susceptibility of different wild birds to HPAIV.

Maps by Denys Muzyka

Acknowledgements

The research was funded by USDA project P444, P444a, P444b through the Ukrainian Science and Technology Center. Part of the research has been made in context of NAAS State Scientific Research program.

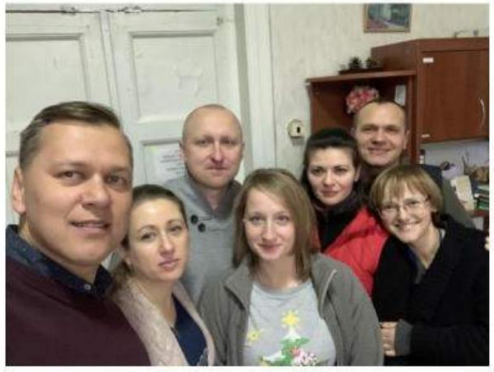
The research was done in National Scientific Center Institute of Experimental and Clinical Veterinary Medicine (Kharkiv, Ukraine), Southeast Poultry Research Laboratory (Athens, Georgia, USA), Friedrich Loeffler Institute (Riems, Germany) and Linnaeus University (Kalmar, Sweden).

The authors gratefully acknowledge ornithologists from Azov-Black Sea Ornithological Station, and especially Dr. Chernychko R.M.

Special thanks Dr. Mary Pantin – Jackwood (SEPRL) for her help and support in research

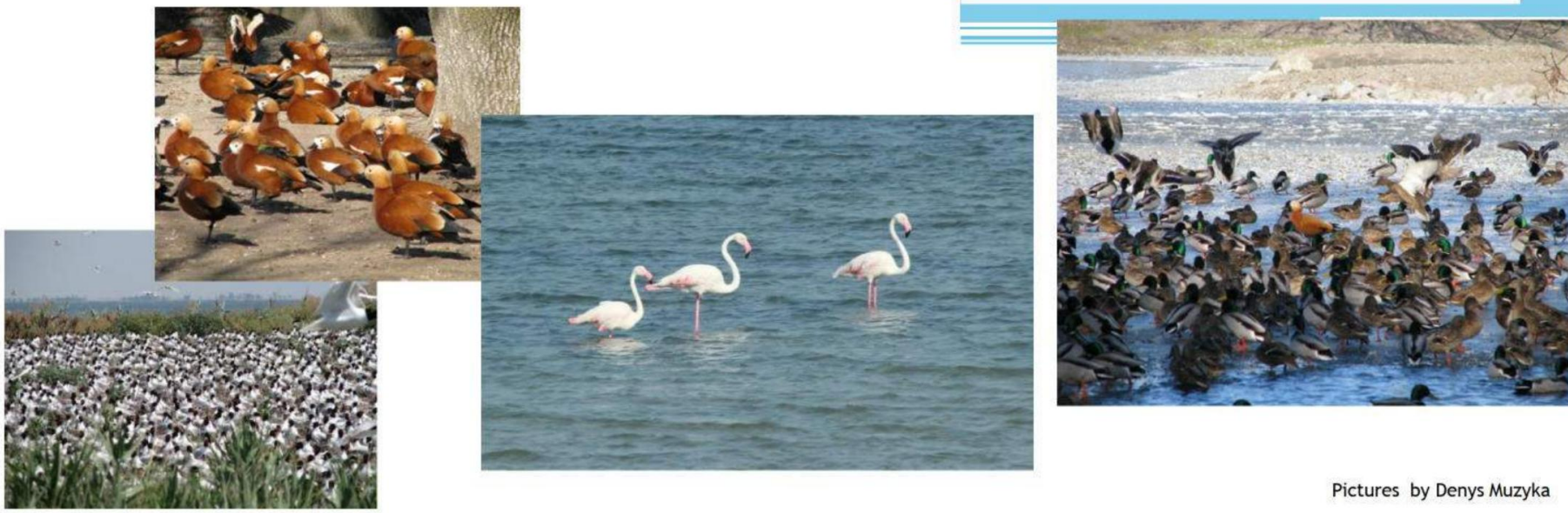
Participation in this conference is supported by DTRA

Our team



Pictures by Denys Muzyka

Thank you!



Pictures by Denys Muzyka

Machine Translated by Google

N RINGS Kyiv T-003062
RING N Ring not sent

SPECIES-SPECIES mallard Anas platyrhynchus

GENDER, grown man.
AGE bad ad
GENDER, AGE CALL DATE
05/15/2019 CALL DATE

PLACE OF THE RING Ukraine, Kherson region
BELL LOCATION Askania-Nova Biosphere Reserve
Ukraine, Kherson O.
Biosphere Reserve "Askaniya-Nova"
COORDINATES 46.28 N 33.50 E
========== === ==========

DATE OF FOUND LOCATION Russia, Ivanovskaya obl. district Luks1k6y.0, 4M.2a0k2 a1ovka
Russia, Ivanovo O
FIND PLACE
Lukskiy district, Makarovka 56.56 N 42.07 E
COORDINATES
THE FOUND DETAILS
FIND DETAILS Mallard, unknown shot, Anas platyrhynchus,
unknown shot
CORRESPONDENT 181/21 BD-Kyiv Askania-Nova
METSCHIK Reserve

DISTANCE 1285 km AZIMUTH 27 1c. TIME 702 days

N RINGS Kyiv T-003459
RING N Ring not sent

SPECIES-SPECIES mallard Anas platyrhynchus

GENDER, AGE grown man.
GENDER, bad ad
AGE CALL DATE 07.02.2020 CALL DATE

PLACE OF THE RING Ukraine, Kherson region
BELL LOCATION Askania-Nova Biosphere Reserve
Ukraine, Kherson O.
Biosphere Reserve "Askaniya-Nova"
COORDINATES 46.28 N 33.50 E
========== === ==========

DATE OF FOUND LOCATION Russia, Voronezh region B0u2t.u0r4lin district . 2o0w2s1ki
FIND PLACE
Russia, Voronezh O.
Buturlinovskiy district
COORDINATES 55.49N 40.55 AND
THE FOUND DETAILS
FIND DETAILS Krizhen, male shot, Anas platyrhynchos, male
shot
CORRESPONDENT 155/21
METSCHIK Askania Nova Reserve

DISTANCE 1135 km AZIMUTH 26 1c. TIME 420 days

AUTHORIZE
And over. Director General of the State Institution “Lviv Regional Center for Disease Control and Prevention of the Ministry of Health of Ukraine”
_____ **Ivanchenko NO**

PLOT

destruction of cultures

February 25, 2022

We, the undersigned, Head of Yavoriv Regional State Institution “Lviv OCCLZ MZ”, Head of Microbiological Laboratory Vakhula ZM,
Laboratory assistants Serdyuk OM, Petrishin TV, Gaiduchok N. Ya.
created a law stating that on February 25, 22, 27 museum trunks were destroyed Cultures (54 tubes of cultures) dated based on a letter from the Ministry of Health of Ukraine February 24, 2022 No. 26-04 / 5362 / 2-22 and the Order of the State Institution "LOCKPZ of the Ministry of Health of Ukraine" No. 59-B dated 24 February 2022 Destroyed by autoclaving as reported Corresponding entries in the accounting records (Form 257/o, Form 270/rev and Inventory Book of Museum Cultures) 54 test tubes containing cultures Microorganisms - infectious agents that are located in the microbiological laboratory of the Yavoriv Regional State University “Lviv Regional Center for Disease Control and Prevention of the Ministry of Health Ukraine", :

root name	**quantity test tubes**
1.Salmonella typhimurium ÿ/ÿ "a" ÿ154	2
2. Proreus mirabilis 150	2
3.Klebsiella pneumoniae ÿ43	2
4. Proteus vulgaris #152	2
5.S. marcescens ÿ 1	2
6. E. faecalis ATCC 19433	2
7.Escherichia coli ÿ55: K59 ÿ3912 / 41	2
8.Escherichia coli ÿÿÿÿ 25922	2

9.Escherichia coli "ÿ"		2
10.Shigella sonnei ÿ/ÿ III		2
11.Shigella flexneri ÿ/ÿ "I a"ÿ 8516		2
12. Listeria monocytogenes		2
13.A. faecalis ÿ415		2
14. Candida albicans ATCC885 - 653		2
15. Pseudomonas aeruginosa ATCC-27853(F-51)		2
16.ÿl. Edematia ÿ198		2
17. B. liheniformis ÿ		2
18.B. stearothermophilis BKM-B718		2
19. Corynebacterium diphtheriae tox(+) NCTC 10648		2
20.Corynebacterium diphtheriae mildew tox(-) 74		2
21. Corynebacterium pseudodiphteriticum ÿ1		2
22. Corynebacterium xerosis NCTC 12079		2
23.Staphylococcus aureus ATCC-25923|F-49		2
24.Staphylococcus epidermidis ÿ 191		2
25. Enterobacter aerogenes #15		2
26. Corynebacterium diphtheriae tox(-) NCTC 10356		2
27. Micrococcus luteus ATCC 3941		2
Total as of February 25, 2022	54	**54**

Head of Yavoriv Regional State Institution
“Lviv OCCP MZ” J Grinchuk

Head of the microbiological
laboratory Z. Wachula

Sanitary Laboratories:

O. Serdyuk
T. Petryshyn
N.Gaiduchok

AUTHORIZE
And over. Director General of the State Institution “Lviv Regional Center for Disease Control and Prevention of the Ministry of Health of Ukraine”
_____ **Ivanchenko NO**

PLOT

destruction of cultures

February 24, 2022

We, the undersigned, are the head of the laboratory of the OOI - Semenishin OB, bacteriologist of the laboratory of the OOI Vasyunets LS, laboratory assistant of the laboratory of OOI Protsik NB, paramedic laboratory assistant of the laboratory of OOI Kobernichenko OM, acting head of the virological laboratory Romanyuk UA, paramedic laboratory assistant of the virological laboratory Adamchuk MS, medical laboratory assistant of the virological Laboratories Ogonkova IS, based on the letter of the Ministry of Health of Ukraine dated February 24, 2022 No. 02/24/2022 destroyed

B. by autoclaving, through which the corresponding postings were made in the account Documentation (Form 257/o, Form 270/o and inventory book of the Museum Kulturen),**322 containers**with cultures of microorganisms - pathogens infectious diseases, which are especially dangerous in the laboratory Infections and virological laboratory of SE "Lviv Regional Center Control and Prevention of Diseases of the Ministry of Health of Ukraine”, :

	root name		number of tubes
1	Yersinia pestis	vaccination strain pest	5
2 Leptospira interrongans		leptospirosis (13 cultures)	232
3	Bacillus anthracis	Siberian strain vaccine	6
4 Brucella		brucellosis strain vaccine	10
5	Francisella tularensis	vaccination strain tularemia	30
6	Listeria monocytogenes	listeriosis	10
7	Yersinia pseudotuberculosis pseudotuberculosis		5
8th	Yersinia enterocolitica yersiniosis cholera (2 cultures)		8th
9 Vibrio cholerae not ÿÿ 01 poisonous			9
10 Vibrio alginoliticus		cholera	5
11 Poliovirus Type I Poliomyelitis Poliovirus III			1
kind		polio	1
	Total as of February 24, 2022		**322**

Head of the laboratory of the OOI Semenishin OB

Doctor - bacteriologist Vasjunets LS

Paramedic Laboratory Assistant Protsik NB

Paramedic Laboratory Assistant Kobernichenko OM

And over. Head of the Virology Laboratory Romanyuk UA

Paramedic Laboratory Assistant Adamchuk MS

Paramedic Laboratory Assistant Ogonkova IS