

5th HEPATITIS C
TECHNICAL ADVISORY
GROUP
TAG Meeting

USING NEXT GENERATION SEQUENCING (NGS) CAPACITY FOR HEPATITIS C SURVEILLANCE IN GEORGIA

Adam Kotorashvili

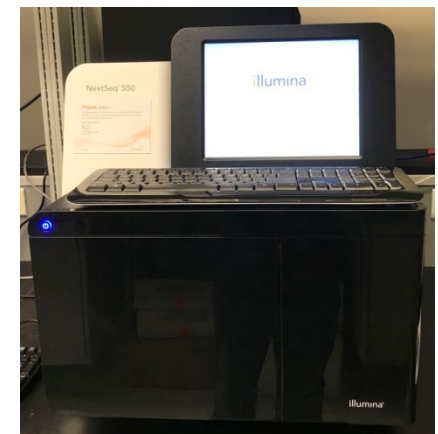
Head of Genome Center

National Center for Disease Control and Public Health, Tbilisi, Georgia

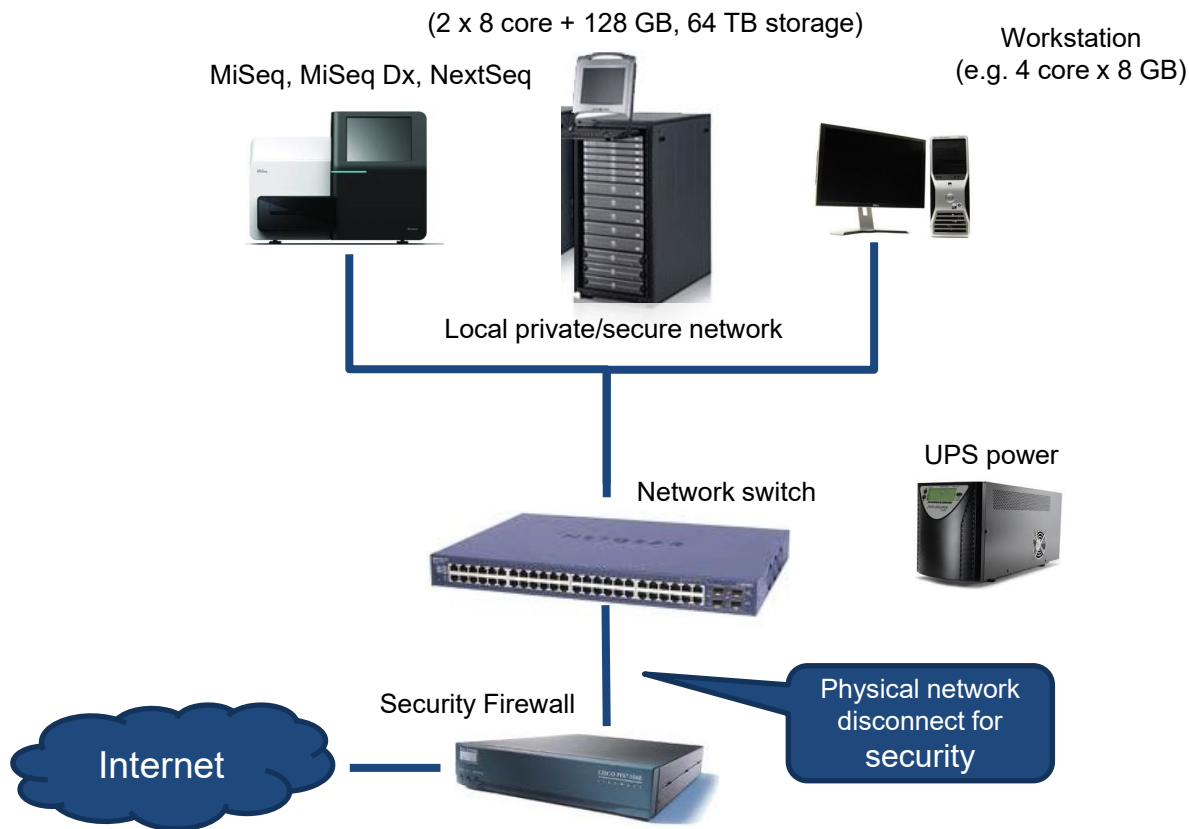
Genome Center at National Center for Disease Control and Public Health – Lab Space



NGS platforms



Bioinformatics



Genomics Machine Specs

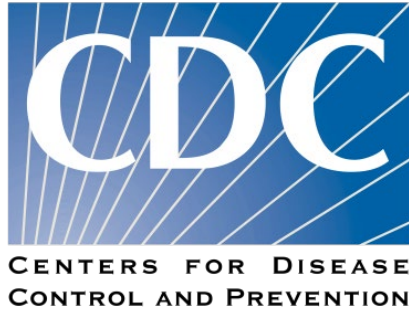
- 2U Rackmount w/ redundant power supply
- Dual Xeon with C602 chipset
- 16 2.0Ghz E-5 series CPU cores
- 128GB DDR3 1600Mhz ECC REG memory
- (8) 2TB Enterprise Hard Drive (2 x OS RAID 1, 6 x RAID 6 w/ 2 Hot Spare) roughly 3.6TB Accessible
- Slimline DVD +/- RW
- dual GigE NIC
- onboard basic graphics
- no sound
- CentOS 6.2 64-bit installed
- Storage

•Includes a 15U Rackmount Enclosure, pre-racked and cabled, shipping crate with ramp. Estimated value of \$2,500.00.

•Includes a 2200VA UPS with temperature monitoring card, racking and shipping. Estimated value of \$2,300.00.

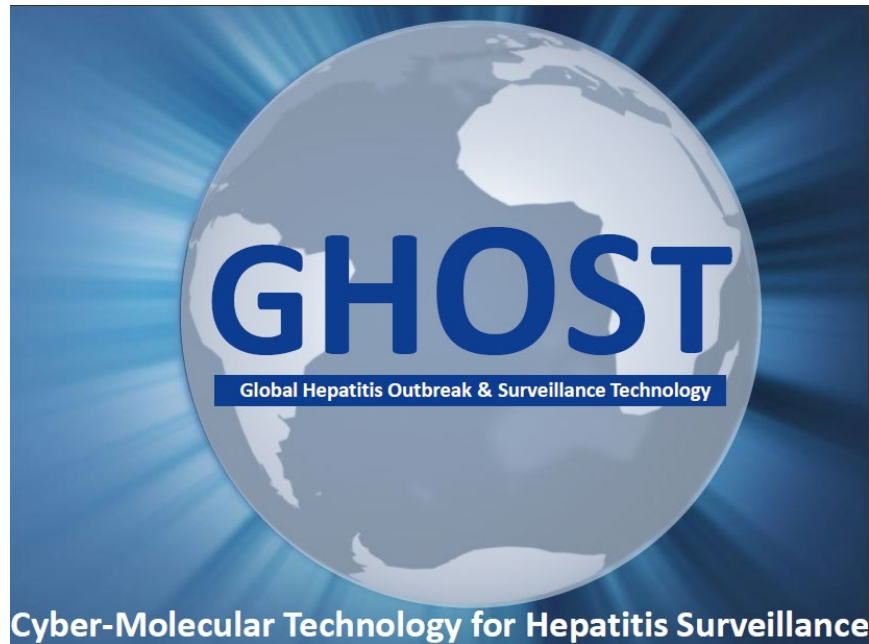
•Includes Hardware testing, installation of CLC Genomics Server, and shipping to end user. The server will be installed on the cabinet, you would just need to unpack the crate, plug in the UPS and then plug in the server.

Collaborations



GHOST (Global Health Outbreaks and Surveillance Technology)

GHOST technology, will be used for hepatitis C (and other hepatitis) in the global surveillance.



Advantages of GHOST

- Massive
- Real-Time
- Cost-effective
- Simple to use
- Expandable to other pathogens

❑ **First Regional Centre for the GHOST** in Caucasus region since 2018

GHOST Network

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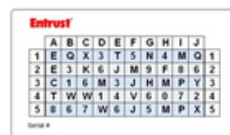
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For External Partners who login with only a SAMS issued UserID and Password.

SAMS Grid Card



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HHS Staff

AMS Login



How to use AMS

Login

For all HHS staff including Operating Divisions (CDC, NIH, FDA, etc.)

AMS One Time Password

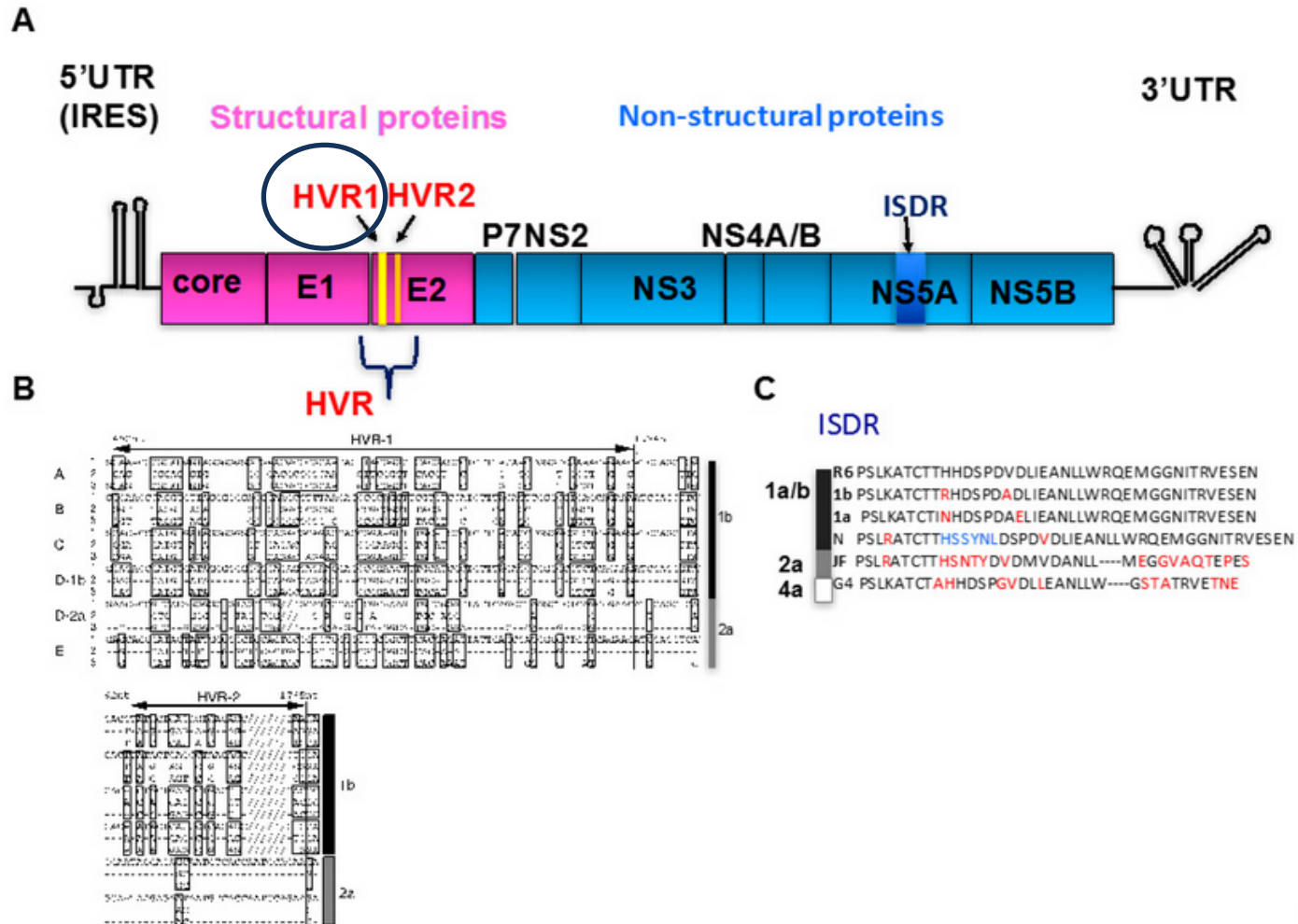


How to use OTP

Login

For all HHS staff including Operating Divisions (CDC, NIH, FDA, etc.) with a One Time Password.

Hepatitis C Virus




Year 1: Launch and capacity building


- Setting up a GHOST center at Lugar Center
- Study molecular epidemiology and transmission patterns of HCV infection among risk groups as part of the Elimination Program
- Support HCV surveillance in Georgia
- Contribute with regional data for the GHOST global database

Methods

- Samples used for the capacity building
 - HCV serosurvey (20 specimens; 2015)
 - Harm Reduction center (24 specimens; 2017)
- RNA extraction – QIAamp Viral RNA mini
- Library preparation – NEBnext Ultra RNA library
- Data quality control and analysis – GHOST tools

Data Submission to GHOST Global Database


Centers for Disease Control and Prevention
 Your Online Source for Credible Health Information

Alpha 0.7.0


User: Kotorashvili, Adam **Global Health Outbreak and Surveillance Technology (GHOST) - Version 0.7.0** **Role:** User

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Task ID	Name	Description	Task Type	Country	State	Status	Date	Data Sets	Owner
1258	combined		Analysis			Complete	11/07/2018	CLEAN(31) ANALYSIS(5)	Kotorashvili, Ad
1258	HCV		Analysis			Complete	11/08/2018	CLEAN(11) ANALYSIS(5)	Kotorashvili, Ad
1188	HR		Analysis			Complete	10/12/2018	CLEAN(4) ANALYSIS(4)	Kotorashvili, Ad
1182	HR		Quality Control	Georgia		Warning	10/10/2018	RAW(48) CLEAN(4)	Kotorashvili, Ad
1033	sero survey		Quality Control	Georgia		Warning	07/09/2018	RAW(48) CLEAN(11)	Kotorashvili, Ad
1019	QC		Quality Control	Georgia		Warning	08/27/2018	RAW(48)	Kotorashvili, Ad
982	test		Analysis			Complete	05/29/2018	CLEAN(9) ANALYSIS(5)	Kotorashvili, Ad
981	first run	test run	Quality Control	Georgia		Warning	05/29/2018	RAW(40) CLEAN(9)	Kotorashvili, Ad
718	analysis workshop	test	Analysis	Georgia		Complete	11/03/2017	CLEAN(7) ANALYSIS(5)	Kotorashvili, Ad
692	test workshop	test	Quality Control	Georgia		Complete	11/03/2017	RAW(14) CLEAN(7)	Kotorashvili, Ad

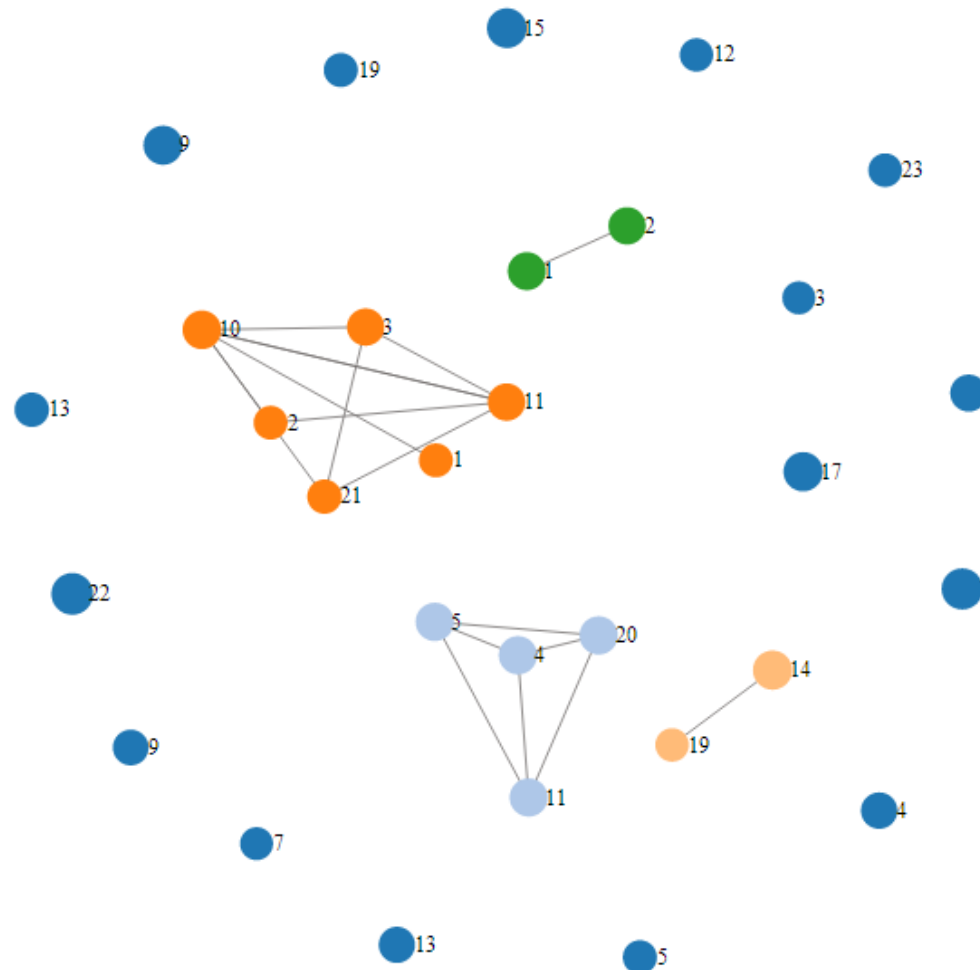
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 800-CDC-INFO (800-232-4636) TTY: (888) 232-6348, 24 Hours/Every Day ghost@cdc.gov

Global Health Outbreak and Surveillance Technology (GHOST) - Version 0.7.0 (Build 001)
 For technical issues, please send e-mail to ghost@cdc.gov.

GHOST – results

Transmission Network Analysis (SS+HR)



No epidemiological data available

Year 2: Activities and plan

- Two NSP sites:
 - Tbilisi
 - Zugdidi
- Samples collected from HR beneficiaries with documented
 - Reinfection
 - Seroconversion and confirmed with viremia test
- Questionnaire prepared for relevant epidemiologic and risk data for associations
- Informed consent will be obtained

Future plans beyond HCV

- WETLAB system automation
- Involve specimens from regional countries
- Apply technology for other pathogens (HIV, HBV)
- Improve/enhance surveillance
- Enrich global GHOST database

Acknowledgments

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