The International Conference
Towards a Global Wastewater Surveillance System for Public Health

iata
Instituto de Agroquímica y Tecnología de Alimentos

EXCELENCIA SEVERO OCHOA

CSIC
Consejo Superior de Investigaciones Científicas






TOWARDS THE IMPLEMENTATION OF A MULTIPATHOGEN SURVEILLANCE SYSTEM: FROM WORKING WITH ENTERIC VIRUSES TO ROUTINELY ANALYZING DOZENS OF DIFFERENT MICROBIAL HAZARDS OF EMERGING CONCERN

Alba Pérez-Cataluña

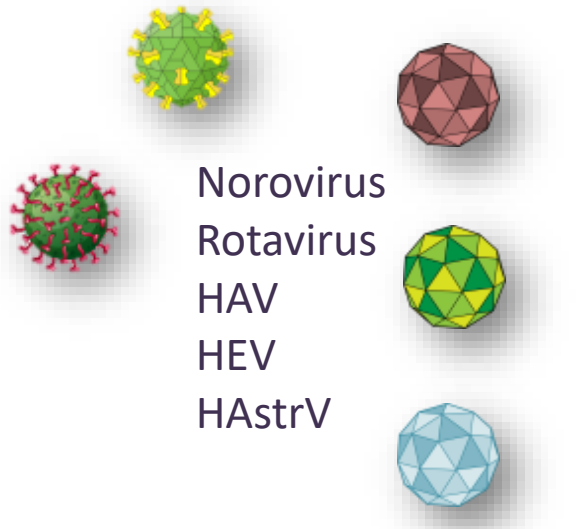
Inés Girón-Guzmán, Enric Cuevas-Ferrando, Azahara Díaz-Reolid, Pablo Puchades-Colera, Regino Barranquero, Irene Falcó-Ferrando, Gloria Sánchez

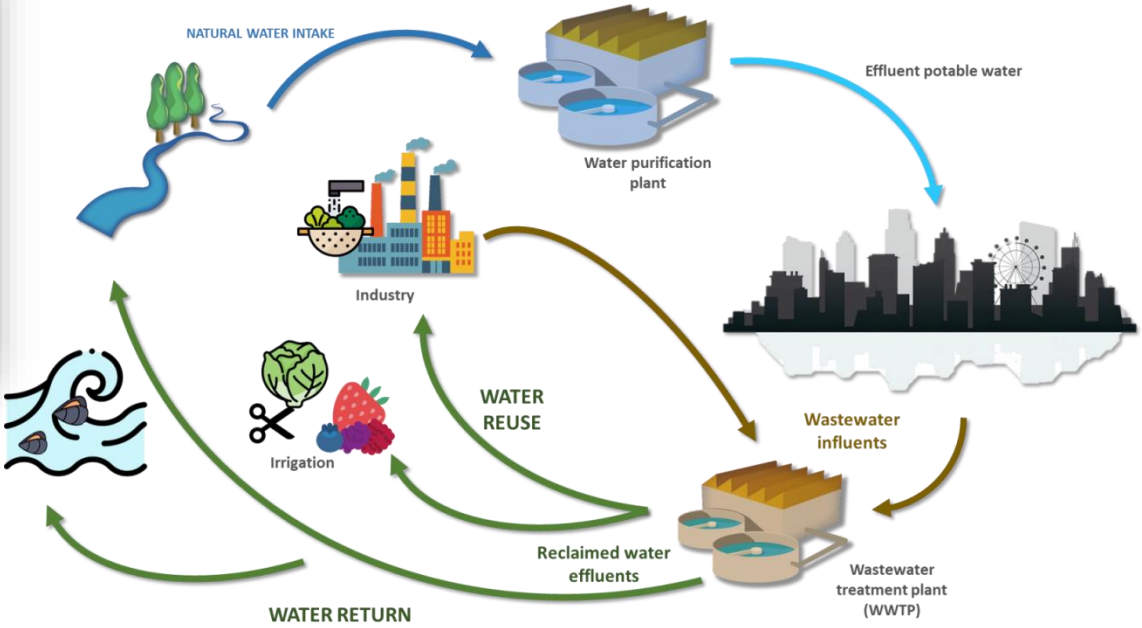
11/17/2023, Frankfurt am Main

VISAFELAB
Environmental Virology & Food Safety

BEFORE 2020…

1 Group leader
2 postdoctoral researchers
2 predoctoral researchers
1 Laboratory technician





iata EXCELENCIA SEVERO OCHOA

…BUT SARS-CoV-2 APPEARED!

Water Research 181 (2020) 115942

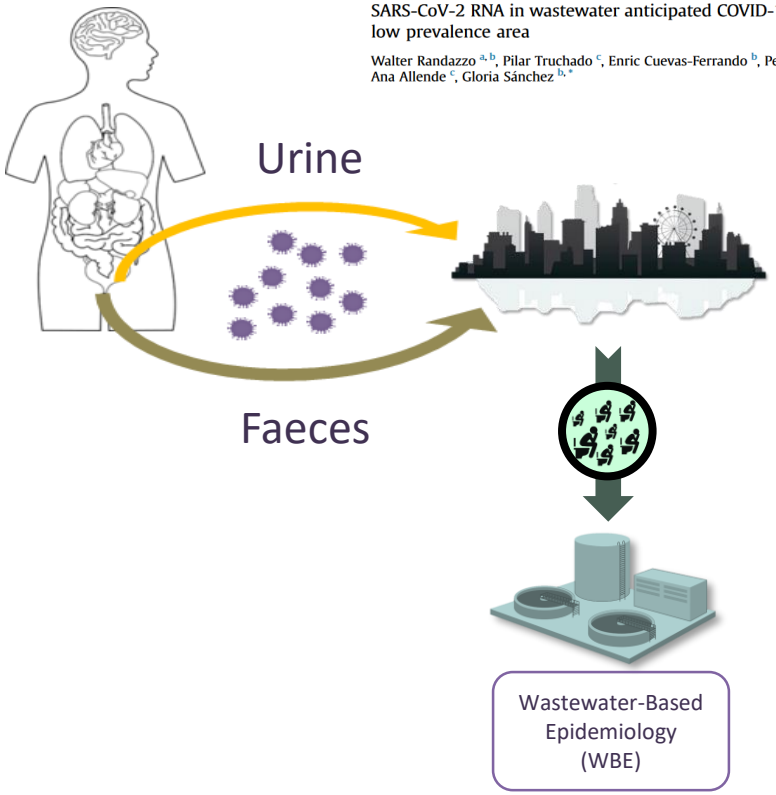
Contents lists available at ScienceDirect

Water Research

journal homepage: www.elsevier.com/locate/watres

SARS-CoV-2 RNA in wastewater anticipated COVID-19 occurrence in a low prevalence area

Walter Randazzo [a, b], Pilar Truchado [c], Enric Cuevas-Ferrando [b], Pedro Simón [d], Ana Allende [c], Gloria Sánchez [b, *]



Science of the Total Environment 862 (2023) 160914

Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv

Evaluation of two different concentration methods for surveillance of human viruses in sewage and their effects on SARS-CoV-2 sequencing

Inés Girón-Guzmán [a,1], Azahara Díaz-Reolid [a,1], Enric Cuevas-Ferrando [a], Irene Falcó [a], Pablo Cano-Jiménez [b,c], Iñaki Comas [b,c], Alba Pérez-Cataluña [a,*], Gloria Sánchez [a]

Science of the Total Environment 758 (2021) 143870

Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv

Comparing analytical methods to detect SARS-CoV-2 in wastewater

Alba Pérez-Cataluña [a,1], Enric Cuevas-Ferrando [a,1], Walter Randazzo [a,b], Irene Falcó [a], Ana Allende [c], Gloria Sánchez [a,*]

Water Research 211 (2022) 118007

Contents lists available at ScienceDirect

Water Research

journal homepage: www.elsevier.com/locate/watres

Spatial and temporal distribution of SARS-CoV-2 diversity circulating in wastewater

Alba Pérez-Cataluña [a,*], Álvaro Chiner-Oms [b], Enric Cuevas-Ferrando [a], Azahara Díaz-Reolid [a], Irene Falcó [a], Walter Randazzo [a], Inés Girón-Guzmán [a], Ana Allende [a], María A. Bracho [d,e,f], Iñaki Comas [b,f], Gloria Sánchez [a]

Environmental Research 203 (2022) 111831

Contents lists available at ScienceDirect

Environmental Research

journal homepage: www.elsevier.com/locate/envres

Discrimination of non-infectious SARS-CoV-2 particles from fomites by viability RT-qPCR

Enric Cuevas-Ferrando [a,1], Inés Girón-Guzmán [a,b,1], Irene Falcó [a], Alba Pérez-Cataluña [a], Azahara Díaz-Reolid [a], Rosa Aznar [a,b], Walter Randazzo [a], Gloria Sánchez [a,*]

www.nature.com/scientificreports

scientific reports

OPEN Platinum chloride-based viability RT-qPCR for SARS-CoV-2 detection in complex samples

Enric Cuevas-Ferrando[1,*], Walter Randazzo[1], Alba Pérez-Cataluña[1], Irene Falcó[1], David Navarro[2,3], Sandra Martín-Latil[4], Azahara Díaz-Reolid[1], Inés Girón-Guzmán[1], Ana Allende[1] & Gloria Sánchez[1]

iata EXCELENCIA SEVERO OCHOA

AND NOWADAYS…

1 Group leader
2 postdoctoral researcher → 3 postdoctoral researchers
2 predoctoral researchers now postdoctoral researchers
4 Laboratory technicians
2 predoctoral researchers

VICEPRESIDENCIA TERCERA DEL GOBIERNO
MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO
VATar COVID-19
HEBAR
GOBIERNO DE ESPAÑA MINISTERIO DE SANIDAD
Forewarn
Aquatic Pollutants
Water JPI
jpiamr
JPI OCEANS
SYMSITES
IMAGE
LAGOON
GENERALITAT VALENCIANA
GOBIERNO DE ESPAÑA MINISTERIO DE CIENCIA E INNOVACIÓN

iata EXCELENCIA SEVERO OCHOA

MONKEYPOX VIRUS

Water Research 231 (2023) 119621

Contents lists available at ScienceDirect

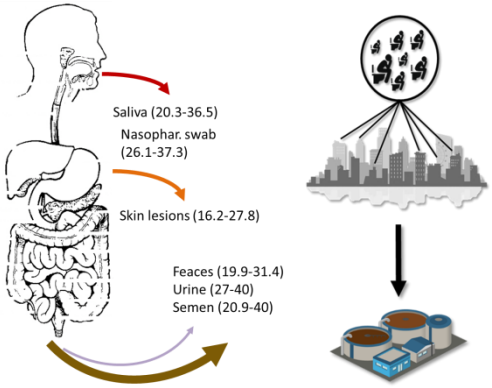
Water Research

journal homepage: www.elsevier.com/locate/watres

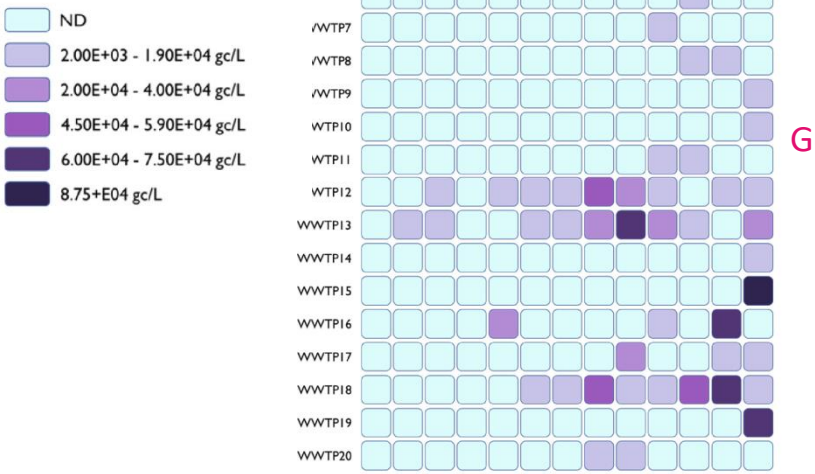
Spanish wastewater reveals the current spread of Monkeypox virus

Inés Girón-Guzmán [a], Azahara Díaz-Reolid [a], Pilar Truchado [b], Albert Carcereny [c], David García-Pedemonte [c], Bruno Hernáez [d], Albert Bosch [c], Rosa María Pintó [c], Susana Guix [c], Ana Allende [b], Antonio Alcamí [d], Alba Pérez-Cataluña [a,*], Gloria Sánchez [a,*]

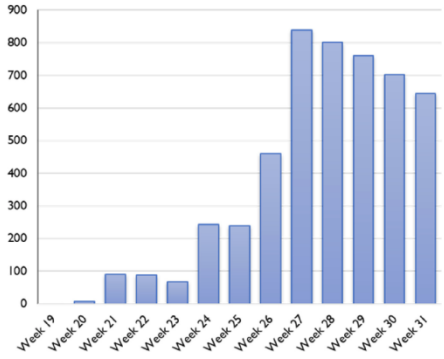
[a] VISAFELab, Department of Preservation and Food Safety Technologies, Institute of Agrochemistry and Food Technology, IATA-CSIC, Avda. Catedrático Agustín Escardino 7, Valencia, Paterna 46980, Spain
[b] Department of Food Science and Technology, CEBAS-CSIC, Research Group on Quality and Safety of Fruits and Vegetables, Campus Universitario de Espinardo, 25, Murcia 30100, Spain
[c] Enteric Virus Laboratory, Department of Genetics, Microbiology, and Statistics, Section of Microbiology, Virology, and Biotechnology, School of Biology, University of Barcelona, Barcelona, Spain
[d] Molecular Biology Center Severo Ochoa, CSIC-UAM, Campus de Cantoblanco, Nicolás Cabrera 1, 28049 Madrid, Spain



Evolution of MPXV DNA prevalence



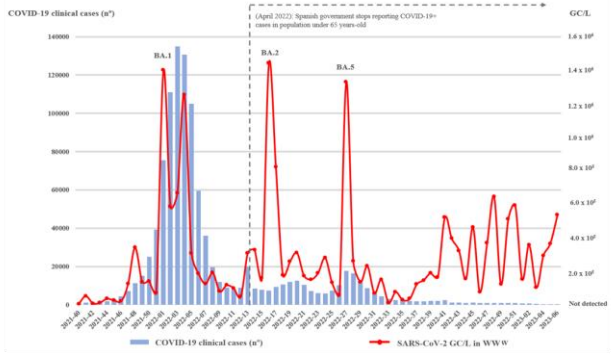
MPXV cases per week

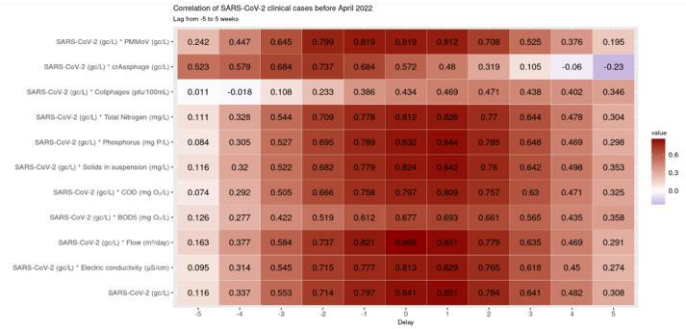


Geographical localization of WWTPs

RESPIRATORY VIRUSES

SARS-CoV-2

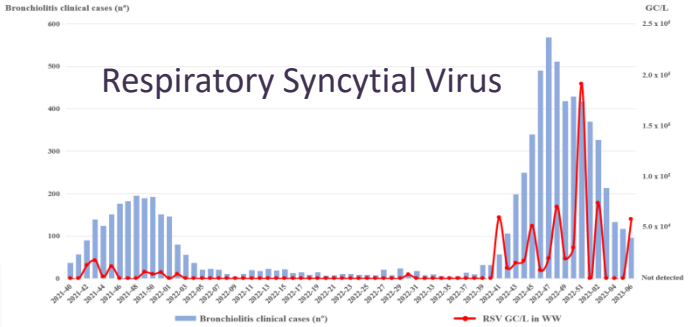


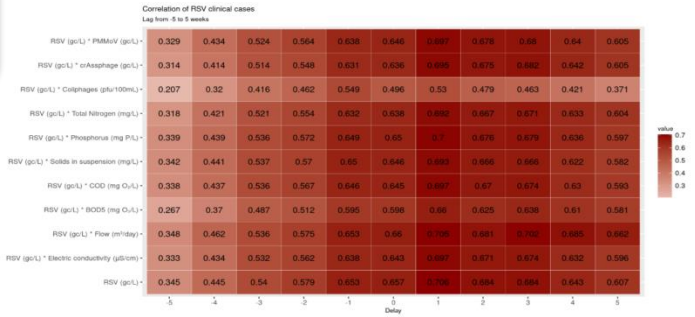


SARS-CoV-2
1-week delay
+
WWTP inflow (m^3/day)

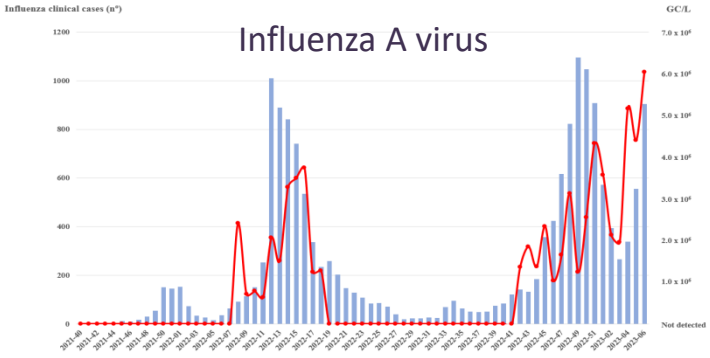
RSV
3-weeks delay
+
WWTP inflow (m^3/day)

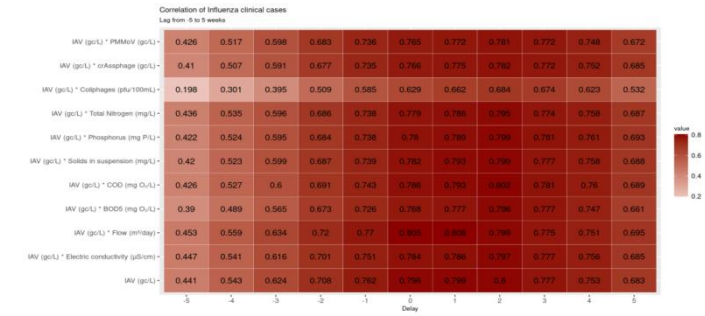
Respiratory Syncytial Virus





Influenza A virus



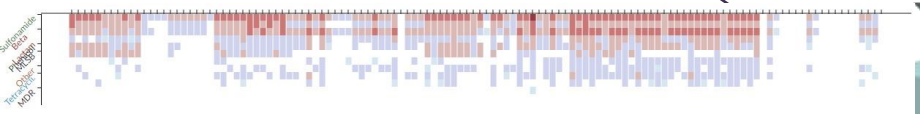


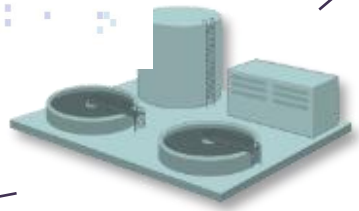
IAV
1-week delay
+
WWTP inflow (m^3/day)

iata EXCELENCIA SEVERO OCHOA

FUTURE GOALS AND BEYOND

ARGs: qPCR/HT-PCR
ESBL *E. coli*/Total coliforms





Norovirus (GI & GII)
Rotavirus
HAV
HEV
HAstrV
Aichi virus
Enterovirus
Adenovirus

crAssphage
PMMoV
Somatic coliphages

IAV
RSV
SARS-CoV-2 (N1, IP4) & VOCs
Avian Influenza virus

West Nile virus
Mpox
Dengue virus
Zika virus

Giardia spp.
Toxoplasma gondii
Cryptosporidium spp.

iata EXCELENCIA SEVERO OCHOA

Forewarn

Aquatic Pollutants

Water JPI

jpiamr

JPI OCEANS

SYMSITES

VATar COVID-19

VICEPRESIDENCIA TERCERA DEL GOBIERNO

MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO

HEBAR

GOBIERNO DE ESPAÑA

MINISTERIO DE SANIDAD

IMAGE

GOBIERNO DE ESPAÑA

MINISTERIO DE CIENCIA E INNOVACIÓN

LAGOON

GENERALITAT VALENCIANA

Conselleria d'Innovació, Universitats, Ciència i Societat Digital

iata

EXCELENCIA SEVERO OCHOA

www.iata.csic.es

The International Conference
Towards a Global Wastewater Surveillance System for Public Health

iata
Instituto de Agroquímica y Tecnología de Alimentos

EXCELENCIA SEVERO OCHOA

CSIC
Consejo Superior de Investigaciones Científicas






TOWARDS THE IMPLEMENTATION OF A MULTIPATHOGEN SURVEILLANCE SYSTEM: FROM WORKING WITH ENTERIC VIRUSES TO ROUTINELY ANALYZING DOZENS OF DIFFERENT MICROBIAL HAZARDS OF EMERGING CONCERN

Alba Pérez-Cataluña

Inés Girón-Guzmán, Enric Cuevas-Ferrando, Azahara Díaz-Reolid, Pablo Puchades-Colera, Regino Barranquero, Irene Falcó-Ferrando, Gloria Sánchez

@VISAFELab
@Albaperezcat

alba.perez@iata.csic.es

VISAFELAB
Environmental Virology & Food Safety

The International Conference
Towards a Global Wastewater Surveillance System for Public Health

iata
Instituto de Agroquímica y Tecnología de Alimentos

EXCELENCIA SEVERO OCHOA

CSIC
Consejo Superior de Investigaciones Científicas






TOWARDS THE IMPLEMENTATION OF A MULTIPATHOGEN SURVEILLANCE SYSTEM: FROM WORKING WITH ENTERIC VIRUSES TO ROUTINELY ANALYZING DOZENS OF DIFFERENT MICROBIAL HAZARDS OF EMERGING CONCERN

Alba Pérez-Cataluña

Inés Girón-Guzmán, Enric Cuevas-Ferrando, Azahara Díaz-Reolid, Pablo Puchades-Colera, Regino Barranquero, Irene Falcó-Ferrando, Gloria Sánchez

@VISAFELab
@Albaperezcat

alba.perez@iata.csic.es

VISAFELAB
Environmental Virology & Food Safety