



Project Title: Expert Opinion on Use of Lumin for
N95 Mask Reprocessing

For: 3B Medical Inc

Dated: 26/03/2020

Author: Dr Robert Lambkin-Williams

Email: rlw@virologyconsult.com

Tel: +44 (0) 1273 620 630

Introduction;

Ultraviolet (UV) radiation is an effective method of sterilisation as it disrupts the base pairing between the DNA or in the case of the COVID-19 virus RNA. Due to the relative rate and efficacy of UV exposure, it is often the preferred method of sterilisation in many settings.

3B produces a convenient UVC disinfection device approximately the size of a toaster oven and therefore convenient to have in multiple locations known as Lumin. It uses a low-pressure mercury-vapour lamp with a power of 2.3 W at a wavelength of 243 nm, which is effective for sterilisation. Also, its internal aluminium based design reflects this radiation by up to 130%.

3B has conducted studies with the contract research organisation Microchem Laboratories on the strain bacterial *G. stearothermophilus* to determine the effect of the device on CPAP masks. Subsequent testing using the strains of *E. coli*, *S. enterica*, *S. aureus* and *K. pneumoniae* were also conducted. In all testing, Lumin demonstrated at least a Log 4 reduction of the bacterial strains.

There is currently a very severe shortage of N95 masks globally, and insufficient manufacturing capacity is available. The ability to reuse these masks would be of considerable benefit to medical and other staff in frequent contact with infectious patients, as no other type of mask is suitable. The Lumin device would appear to provide a convenient method to do this. The lack of masks was reported in the New York Times by journalist Gina Kolata published on March 20, 2020, describing the shortage as dire. Previously guidance from the National Institute for Occupational Safety and Health said that if masks were contaminated, they could no longer be certified for use. On March 19, 2020, the (CDC 2020) agency issued new guidance, saying that "as a last resort, it may be necessary" for hospitals to use masks that were not approved by the National Institute for Occupational Safety and Health.

Decontamination and reuse of masks is not a new idea, and a variety of methods have been tested including bleach, ethylene gas, moist heat and UV irradiation and reported in it has been reported in published papers this can work allows.

I was approached as an independent respiratory virologist based on over 25 years of experience in virology. My work has included virucidal testing, clinical studies and the use of N95 masks in quarantine situations, in which staff are exposed to deliberately infected volunteer.

I was asked to independently review whether the data from the reports of independent contract research organisations the company had commissioned can be extrapolated during the current pandemic of COVID-19, which is a global emergency, for the reuse of the masks; thus this would significantly increase the ability of reuse N95 masks.

Human coronavirus is inactivated at a dose UV dose range of 22mJ/cm². The Lumin device can deliver a dose range from 300mJ/cm² 500mJ/cm².

RNA viruses can be inactivated at a similar dose range as a bacteria, and I have been asked to review the data and consider whether the device is capable of inactivating the COVID-19 virus after 1-minute treatment with the device.

The bacterial studies tested the device against bacterially contaminated CPAP accessories. The masks and containers were exposed for three different time periods 3 minutes, 5 minutes and 7 minutes.

Author: Dr R Lambkin-Williams

EMAIL: rlw@virologyconsult.com

www.virologyconsult.com

The standard cycle time for the use of the device is 5 minutes. At all three time points 3, 5 and 7, there was no detectable virus present after treatment, effectively a 100% sterilisation rate. Given the UV dose used and the important data from the three-time points tested, it would be very likely that a 1-minute cycle would be sufficient to achieve sterilisation. A 60-second duration would theoretically result in a UVC exposure of 30mj/cm².

The use of UV irradiation on N95 masks has been considered previously, particularly the filtration performance and structural integrity (Lindsley et al. 2015). Lindsley et al. describe an elaborate set up in a chamber of 91cm x31cm by 64 cm fitted with two UVC lamps they tested. It is essential to test that the structural integrity of the material from which the masks are constructed is not damaged and neither is their ability to filtrate. There was only a small effect on filter penetration and no effect on flow resistance at doses up to 950 J/cm², three times that of the Lumin device. The body material of the mask was affected to a limited degree, while the integrity of the straps was less affected. The structural integrity of the mask is important because if a proper face fit is not achieved, then the filtration mask is useless.

A shortened exposure time to one minute will reduce this slight degradation even further.

Recommendations;

- A one minute cycle time for sterilisation is likely sufficient, and the current global emergency justifies this.
- The number of times a filter is sterilised should be recorded, and the condition of the body and straps monitored. In my professional opinion, I believe that Lumin can be safely used to reprocess a mask at a minimum of up to 10 times as no degradation was observed in the previous testing was observed.
- Before using recycled masks, they should be inspected for structural integrity as a precautionary measure.

About the Author: In 2001, Dr Rob Lambkin-Williams designed and implemented the first Human Viral Challenge Study to be conducted in Europe in the 21st century. He designed the first series of pilot studies, accommodating the regulatory challenges that this presented. He wrote the original protocols, ethics committee submissions. He oversaw the GMP quality standards for the virus used, the conduct of the studies in temporary quarantine facilities and the analysis of the data. Also, Rob has published extensively on multiple respiratory viruses, including influenza, RSV, rhinovirus and Urbani-SARS. His PhD focussed on the mutability of influenza and its ability to drift antigenically, requiring yearly vaccination. He has more recently worked on the development of a universal (broad) vaccine against influenza and vaccines on RSV.

Author: Dr R Lambkin-Williams

EMAIL: rlw@virologyconsult.com


www.virologyconsult.com



Connecting Research
and Researchers

Dr Robert Lambkin-Williams
Research Summary

Robert Lambkin-Williams

 <https://orcid.org/0000-0003-2107-0174>

Websites & Social Links

hVIVO (<http://www.hvivo.com>)

Linkedin (<https://www.linkedin.com/in/roblw>)

Research Gate (https://www.researchgate.net/profile/Robert_Lambkin-Williams2)

Country

United Kingdom

Other IDs

Scopus Author ID: 16319150700 (<http://www.scopus.com/inward/authorDetails.url?authorID=16319150700&partnerID=MN8TOARS>)

ResearcherID: P-5963-2016 (<http://www.researcherid.com/rid/P-5963-2016>)

Scopus Author ID: 6601996658 (<http://www.scopus.com/inward/authorDetails.url?authorID=6601996658&partnerID=MN8TOARS>)

Employment (4)

VirologyConsult.com: London and Brighton, England, GB

2019-07-19 to present | Consultant (Board)

Employment

Source:Robert Lambkin-Williams

hVIVO (United Kingdom): London, GB

2016 to 2019 | Chief Scientific Officer/ Executive Scientific Adviser

Employment

Source:Robert Lambkin-Williams

Retroscreen Virology (United Kingdom): London, GB

2014 to 2016-07-16 | Chief Scientific Officer

Employment

Source:Robert Lambkin-Williams

Queen Mary, Uni of London and Retroscreen Virology (United Kingdom): London, GB

1995-05-12 to 2014 | Founding Scientist through to Chief Executive Officer (Clinical Science Group)

Employment

Source:Robert Lambkin-Williams

Education and qualifications (2)

University of Warwick: Coventry, West Midlands, GB

| PhD student (Biological Science)

Qualification

Source:Robert Lambkin-Williams

University of Brighton: Brighton, GB

| Undergrad Student (Pharmacy)

Qualification

Source:Robert Lambkin-Williams

Membership and service (5)

International Society for Influenza and other

Respiratory Virus Diseases: Atlanta, Georgia, US

| Member

Membership

Source:Robert Lambkin-Williams

International Alliance for Biological Standardization:

Geneva, CH

Membership

Source:Robert Lambkin-Williams

Royal Society of Medicine: London, GB

| Fellow

Membership

Source:Robert Lambkin-Williams

Medical Journalists' Association: London, GB

2018-01-01 to present

Membership

Source:Robert Lambkin-Williams

European Respiratory Society: Lausanne, CH

2018-01-01 to present | Member

Membership

Source:Robert Lambkin-Williams

Works (163 of 163)

The human viral challenge model: accelerating the evaluation of respiratory antivirals, vaccines and novel diagnostics

Respiratory Research

2018-12 | journal-article

DOI: 10.1186/s12931-018-0784-1

Source:Crossref

The Effect of Influenza Virus on the Human Oropharyngeal Microbiome.

Clinical infectious diseases : an official publication of the Infectious Diseases Society of America

2018-11 | journal-article

PMID: 30445563

DOI: 10.1093/cid/ciy821

Source:Robert Lambkin-WilliamsviaEurope PubMed Central

The manufacturing of human viral challenge agents for use in clinical studies to accelerate the drug development process.

BMC research notes

2018-08 | journal-article

PMID: 30157933

PMC: PMC6114718

DOI: 10.1186/s13104-018-3636-7

Source:Robert Lambkin-WilliamsviaEurope PubMed Central

Infectious virus in exhaled breath of symptomatic seasonal influenza cases from a college community.

Proceedings of the National Academy of Sciences of the United States of America

2018-01 | journal-article

PMID: 29348203

PMC: PMC5798362

DOI: 10.1073/pnas.1716561115

Source:Robert Lambkin-WilliamsviaEurope PubMed Central

Reply to Hunsberger and Memoli, "Efficacy Analysis in Healthy-Volunteer Influenza Challenge Trials: Intention To Treat"

Antimicrobial Agents and Chemotherapy

2018 | journal-article

WOSUID: WOS:000418565300050

Source:Publons

The effect of influenza virus on the human oropharyngeal microbiome

Clinical Infectious Diseases

2018 | journal-article

Source:Robert Lambkin-Williams

Reply to Hunsberger and Memoli, "Efficacy Analysis in Healthy-Volunteer Influenza Challenge Trials: Intention To Treat".

Antimicrobial agents and chemotherapy

2017-12 | journal-article

PMID: 29269431

PMC: PMC5740363

DOI: 10.1128/AAC.02034-17

Source:Robert Lambkin-Williams via Europe PubMed Central

GPs must brace themselves for a gruelling flu season

Pulse

2017-09-23 | magazine-article

Source:Robert Lambkin-Williams

Safety and Efficacy of MHAA4549A, a Broadly Neutralizing Monoclonal Antibody, in a Human Influenza A Challenge Model: A Phase 2 Randomized Trial.

Antimicrobial agents and chemotherapy

2017-08 | journal-article

PMID: 28807912

DOI: 10.1128/aac.01154-17

Source:Robert Lambkin-Williams via Europe PubMed Central

Nasopharyngeal Protein Biomarkers of Acute Respiratory Virus Infection.

EBioMedicine

2017-03 | journal-article

PMID: 28238698

PMC: PMC5360578

DOI: 10.1016/j.ebiom.2017.02.015

Source:Robert Lambkin-Williams via Europe PubMed Central

The effective rate of influenza reassortment is limited during human infection.

PLoS Pathogens

2017-02 | journal-article

PMID: 28170438

PMC: PMC5315410

DOI: 10.1371/journal.ppat.1006203

Source:Robert Lambkin-Williams via Europe PubMed Central

An Intranasal Proteosome-Adjuvanted Trivalent Influenza Vaccine Is Safe, Immunogenic & Efficacious in the Human Viral Influenza Challenge Model. Serum IgG & Mucosal IgA Are Important Correlates of Protection against Illness Associated with Infection

PLOS ONE

2016-12-22 | journal-article

DOI: 10.1371/journal.pone.0163089

Source:Crossref

Re-Inventing the Common Cold Institute for the 21st Century

Journal of Human Virology & Retrovirology

2016-01-04 | journal-article

DOI: 10.15406/jhvr.2015.02.00075

Part of ISSN: 2373-6453

Source:Robert Lambkin-Williams via Crossref Metadata Search

A genomic signature of influenza infection shows potential for presymptomatic detection, guiding early therapy, and monitoring clinical responses

Open Forum Infectious Diseases

2016 | journal-article

DOI: 10.1093/ofid/ofw007

EID: 2-s2.0-85000702084

Source:Robert Lambkin-Williams via Scopus - Elsevier

A tool for investigating asthma and COPD exacerbations: A newly manufactured and well characterised GMP wild-type human rhinovirus for use in the human viral challenge model

PLoS ONE

2016 | journal-article

DOI: 10.1371/journal.pone.0166113

EID: 2-s2.0-85006056501

Source:Scopus - Elsevier

Accelerating influenza research: Vaccines, antivirals, immunomodulators and monoclonal antibodies. The manufacture of a new wild-type H3N2 virus for the human viral challenge model

PLoS ONE

2016 | journal-article

DOI: 10.1371/journal.pone.0145902

EID: 2-s2.0-84955298270

Source:Robert Lambkin-Williams via Scopus - Elsevier

Correction: Accelerating influenza research: Vaccines, antivirals, immunomodulators and monoclonal antibodies. The manufacture of a new wild-type H3N2 virus for the human viral challenge model

PLoS ONE

2016 | journal-article

DOI: 10.1371/journal.pone.0157211

EID: 2-s2.0-84975472468

Source:Scopus - Elsevier

Deep sequencing of influenza A virus from a human challenge study reveals a selective bottleneck and only limited intrahost genetic diversification

Journal of Virology

2016 | journal-article

DOI: 10.1128/JVI.01657-16

EID: 2-s2.0-85001099427

Source:Scopus - Elsevier

Differential evolution of peripheral cytokine levels in symptomatic and asymptomatic responses to experimental influenza virus challenge

Clinical and Experimental Immunology

2016 | journal-article

DOI: 10.1111/cei.12736

EID: 2-s2.0-84958906718

Source:Robert Lambkin-Williams via Scopus - Elsevier

A synthetic influenza virus vaccine induces a cellular immune response that correlates with reduction in symptomatology and virus shedding in a randomized phase Ib live-virus challenge in humans

Clinical and Vaccine Immunology

2015 | journal-article

DOI: 10.1128/CVI.00098-15

EID: 2-s2.0-84936866203

Source:Robert Lambkin-Williams via Scopus - Elsevier

Activity of oral ALS-008176 in a respiratory syncytial virus challenge study

New England Journal of Medicine

2015 | journal-article

DOI: 10.1056/NEJMoa1413275

EID: 2-s2.0-84947719880

Source:Robert Lambkin-Williams via Scopus - Elsevier

Differential evolution of peripheral cytokine levels in symptomatic and asymptomatic responses to experimental influenza virus challenge

Clinical & Experimental Immunology

2015 | journal-article

Source:Robert Lambkin-Williams

LATE-BREAKING ABSTRACT: Discovering new treatments for asthma and COPD. The use of the human viral challenge model with a newly manufactured and characterised GMP human rhinovirus

European Respiratory Journal

2015 | journal-article

Source:Robert Lambkin-Williams

Use of qualitative integrative cyclo PCR (qicPCR) to identify optimal therapeutic dosing time-points in a Respiratory Syncytial Virus Human Viral Challenge Model (hVCM)

Journal of Virological Methods

2015 | journal-article

DOI: 10.1016/j.jviromet.2015.08.019

EID: 2-s2.0-84941202625

Source:Robert Lambkin-Williams via Scopus - Elsevier

Vaccine is imperfect, but it saves lives*Pharmaceutical Journal*

2015 | journal-article

EID: 2-s2.0-84949426958

Source:Robert Lambkin-Williams*via*Scopus - Elsevier**Intranasal H5N1 vaccines, adjuvanted with chitosan derivatives, protect ferrets against highly pathogenic influenza intranasal and intratracheal challenge***PLoS ONE*

2014 | journal-article

DOI: 10.1371/journal.pone.0093761

EID: 2-s2.0-84901314963

Source:Robert Lambkin-Williams*via*Scopus - Elsevier**LATE BREAKER ABSTRACTS***Open Forum Infectious Diseases*

2014 | journal-article

Source:Robert Lambkin-Williams**Oral GS-5806 activity in a respiratory syncytial virus challenge study***New England Journal of Medicine*

2014 | journal-article

DOI: 10.1056/NEJMoa1401184

EID: 2-s2.0-84907363348

Source:Robert Lambkin-Williams*via*Scopus - Elsevier**Risk Factors Associated with Severe Clinical Outcomes of Pandemic H1N1 Infection***J Hum Virol Retrovirol*

2014 | journal-article

Source:Robert Lambkin-Williams**Virus-specific antibody secreting cell, memory B-cell, and sero-antibody responses in the human influenza challenge model***Journal of Infectious Diseases*

2014 | journal-article

DOI: 10.1093/infdis/jit650

EID: 2-s2.0-84898849416

Source:Robert Lambkin-Williams*via*Scopus - Elsevier

A host transcriptional signature for presymptomatic detection of infection in humans exposed to influenza H1N1 or H3N2

PloS one

2013 | journal-article

Source:Robert Lambkin-Williams

A Host Transcriptional Signature for Presymptomatic Detection of Infection in Humans Exposed to Influenza H1N1 or H3N2

PLoS ONE

2013 | journal-article

DOI: 10.1371/journal.pone.0052198

EID: 2-s2.0-84872252677

Source:Robert Lambkin-Williams*via*Scopus - Elsevier

Comparing influenza and RSV viral and disease dynamics in experimentally infected adults predicts clinical effectiveness of RSV antivirals

Antiviral Therapy

2013 | journal-article

DOI: 10.3851/IMP2629

EID: 2-s2.0-84892402732

Source:Robert Lambkin-Williams*via*Scopus - Elsevier

Correlation between Human Leukocyte Antigen Class II Alleles and HAI Titers Detected Post-Influenza Vaccination

PLoS ONE

2013 | journal-article

DOI: 10.1371/journal.pone.0071376

EID: 2-s2.0-84881234538

Source:Robert Lambkin-Williams*via*Scopus - Elsevier

Impact of the demand for 'proxy assent' on recruitment to a randomised controlled trial of vaccination testing in care homes

Journal of medical ethics

2013 | journal-article

Source:Robert Lambkin-Williams

Longitudinal analysis of leukocyte differentials in peripheral blood of patients with acute respiratory viral infections

Journal of Clinical Virology

2013 | journal-article

DOI: 10.1016/j.jcv.2013.09.015

EID: 2-s2.0-84888842792

Source:Robert Lambkin-Williams via Scopus - Elsevier

RV568, a narrow spectrum kinase inhibitor (NSKI), inhibits virus induced nasal interleukin-8 (IL8) in the human viral challenge model where healthy adult male volunteers were experimentally inoculated with live respiratory syncytial virus

European Respiratory Journal

2013 | journal-article

WOSUID: WOS:000209370400225

Source:Publons

RV568, a narrow spectrum kinase inhibitor (NSKI), inhibits virus induced nasal interleukin-8 (IL8) in the human viral challenge model where healthy adult male volunteers were experimentally inoculated with live respiratory syncytial virus

European Respiratory Journal

2013 | journal-article

Source:Robert Lambkin-Williams

Vaccine-Screening Method

2012-12 | other

Source:Robert Lambkin-Williams

Anti-viral Formulations Nanomaterials and Nanoparticles

2012-11 | other

Source:Robert Lambkin-Williams

EDITORIAL COMMENTARIES

2012 | journal-article

Source:Robert Lambkin-Williams

**EFFECT OF MUCOSAL IGA ANTIBODY ON DETECTION
OF "CULTURABLE" RSV VIRUS IN EXPERIMENTAL
RESPIRATORY SYNCYTIAL VIRUS (RSV) INFECTIONS
OF ADULTS**

Journal of Investigative Medicine

2012 | journal-article

WOSUID: WOS:000298634402488

Source:Publons

**EFFECT OF MUCOSAL IGA ANTIBODY ON DETECTION
OF" CULTURABLE" RSV VIRUS IN EXPERIMENTAL
RESPIRATORY SYNCYTIAL VIRUS (RSV) INFECTIONS
OF ADULTS**

JOURNAL OF INVESTIGATIVE MEDICINE

2012 | conference-paper

Source:Robert Lambkin-Williams

**Induction of protective T cell immunity against
influenza using a novel peptide vaccine**

European Respiratory Journal

2012 | journal-article

Source:Robert Lambkin-Williams

**Poly-L-arginine and dextran sulfate-based nanocomplex
for epidermal growth factor receptor (EGFR) siRNA
delivery: its application for head and neck cancer
treatment**

Pharmaceutical research

2012 | journal-article

Source:Robert Lambkin-Williams

**Preexisting influenza-specific CD4 ⁺ T
cells correlate with disease protection against influenza
challenge in humans**

Nature Medicine

2012 | journal-article

DOI: 10.1038/nm.2612

EID: 2-s2.0-84862776631

Source:Robert Lambkin-Williams via Scopus - Elsevier

**Preliminary Assessment of the Efficacy of a T-Cell--
Based Influenza Vaccine, MVA-NP+ M1, in Humans**

Clinical infectious diseases

2012 | journal-article

Source:Robert Lambkin-Williams

Revealing the role of CD4+ T cells in viral immunity*The Journal of experimental medicine*

2012 | journal-article

Source:Robert Lambkin-Williams**Use of a human influenza challenge model to assess person-to-person transmission: Proof-of-concept study***Journal of Infectious Diseases*

2012 | journal-article

DOI: 10.1093/infdis/jir701

EID: 2-s2.0-84555189228

Source:Robert Lambkin-Williams via Scopus - Elsevier**Vaccines-Screening Method**

2011-12 | other

Source:Robert Lambkin-Williams**A new intranasal influenza vaccine based on a novel polycationic lipid-ceramide carbamoyl-spermine (CCS).****II. Studies in mice and ferrets and mechanism of adjuvanticity***Vaccine*

2011 | journal-article

DOI: 10.1016/j.vaccine.2011.01.009

EID: 2-s2.0-79952362972

Source:Robert Lambkin-Williams via Scopus - Elsevier**A new intranasal influenza vaccine based on a novel polycationic lipid-ceramide carbamoyl-spermine (CCS).****II. Studies in mice and ferrets and mechanism of adjuvanticity***Vaccine*

2011 | journal-article

Source:Robert Lambkin-Williams**A Novel Vaccine Against Influenza Based on the Polycationic Sphingolipid Ceramide Carbamoyl-spermine (CCS) as a Carrier/adjuvant for Intramuscular and Intranasal Vaccination**

2011 | dissertation-thesis

Source:Robert Lambkin-Williams

Influenza vaccines have a short but illustrious history of dedicated science enabling the rapid global production of a/swine (H1N1) vaccine in the current pandemic

Birkhauser Advances in Infectious Diseases

2011 | book

DOI: 10.1007/978-3-0346-0279-2_6

EID: 2-s2.0-79960067097

Source:Robert Lambkin-Williams via Scopus - Elsevier

Influenza vaccines have a short but illustrious history of dedicated science enabling the rapid global production of A/swine (H1N1) vaccine in the current pandemic

Influenza Vaccines for the Future

2011 | book-chapter

Source:Robert Lambkin-Williams

Use of a human influenza challenge model to assess person-to-person transmission: proof-of-concept study

Journal of Infectious Diseases

2011 | journal-article

Source:Robert Lambkin-Williams

A randomized, double-blind, placebo-controlled study of an RNAi-based therapy directed against respiratory syncytial virus

Proceedings of the National Academy of Sciences of the United States of America

2010 | journal-article

DOI: 10.1073/pnas.0912186107

EID: 2-s2.0-77952688315

Source:Robert Lambkin-Williams via Scopus - Elsevier

A randomized, double-blind, placebo-controlled study of an RNAi-based therapy directed against respiratory syncytial virus

Proceedings of the National Academy of Sciences

2010 | journal-article

Source:Robert Lambkin-Williams

Historical review of pandemic influenza A in Taiwan, 2009*Pediatrics & Neonatology*

2010 | journal-article

Source:Robert Lambkin-Williams**hla class ii genes and alleles correlate with humoral immune responses to influenza vaccination in the aged: p95***Tissue Antigens*

2010 | journal-article

Source:Robert Lambkin-Williams**Immunogenicity, protective efficacy and mechanism of novel CCS adjuvanted influenza vaccine***Vaccine*

2010 | journal-article

DOI: 10.1016/j.vaccine.2010.04.011

EID: 2-s2.0-77956397833

Source:Robert Lambkin-Williams via Scopus - Elsevier**Influenza vaccines for the future**

2010 | book

Source:Robert Lambkin-Williams**Inhaled cationic airway lining modulator (iCALM) therapy, A novel aerosol treatment for respiratory infections reduces clinical symptoms and transmission of influenza A infection***Am J Respir Crit Care Med*

2010 | journal-article

Source:Robert Lambkin-Williams**Inhaled cationic airway lining modulator (iCALM) therapy, a novel aerosol treatment for respiratory infections reduces clinical symptoms and transmission of Influenza A infection.***American Journal of Respiratory and Critical Care Medicine*

2010 | journal-article

DOI: 10.1164/AJRCCM-CONFERENCE.2010.181.1_MEETINGABSTRACTS.A6846

WOSUID: WOS:000208771005442

Source:Publons

Viral load drives disease in humans experimentally infected with respiratory syncytial virus

American Journal of Respiratory and Critical Care Medicine

2010 | journal-article

DOI: 10.1164/rccm.201002-0221OC

EID: 2-s2.0-78349243640

Source:Robert Lambkin-Williams*via*Scopus - Elsevier

Oien NC, Nicholson B, Kingsmore S, Carin L, Woods CW, Ginsburg GS: Gene expression signatures diagnose influenza and other symptomatic respiratory viral infections in humans

Cell Host and Microbe

2009 | journal-article

Source:Robert Lambkin-Williams

DNA vaccination protects against an influenza challenge in a double-blind randomised placebo-controlled phase 1b clinical trial

Vaccine

2009 | journal-article

DOI: 10.1016/j.vaccine.2009.02.061

EID: 2-s2.0-62949237235

Source:Robert Lambkin-Williams*via*Scopus - Elsevier

Gene Expression Signatures Diagnose Influenza and Other Symptomatic Respiratory Viral Infections in Humans

Cell Host and Microbe

2009 | journal-article

DOI: 10.1016/j.chom.2009.07.006

EID: 2-s2.0-69949148793

Source:Robert Lambkin-Williams*via*Scopus - Elsevier

Treatment with aerosol PUR003, a novel cationic airway lining modulator, reduces influenza replication in vitro and significantly diminishes the severity of Influenza infection in swine and ferrets

2009 | journal-article

Source:Robert Lambkin-Williams

A curious thing*BMJ*

2008 | journal-article

DOI: 10.1136/bmj.a843

EID: 2-s2.0-85007758031

Source:Scopus - Elsevier**A plant-produced influenza subunit vaccine protects ferrets against virus challenge***Influenza and other Respiratory Viruses*

2008 | journal-article

DOI: 10.1111/j.1750-2659.2008.00037.x

EID: 2-s2.0-53849117740

Source:Scopus - Elsevier**AJ 8 Mann, and J**

2008 | book

Source:Robert Lambkin-Williams**Animal models in influenza vaccine testing***Expert Review of Vaccines*

2008 | journal-article

DOI: 10.1586/14760584.7.6.783

EID: 2-s2.0-49449117372

Source:Robert Lambkin-Williams via Scopus - Elsevier**Development of a human experimental infection model of respiratory syncytial virus (RSV) and evaluation of an RNA interference (RNAi) therapeutic for safety and anti-viral efficacy in man***Journal of Allergy and Clinical Immunology*

2008 | journal-article

Source:Robert Lambkin-Williams**HLA class II gene and allele associations with the immune response to influenza vaccination in the elderly***INTERNATIONAL JOURNAL OF IMMUNOGENETICS*

2008 | conference-paper

Source:Robert Lambkin-Williams

Hla class li gene and allele associations with the immune response to influenza vaccination in the elderly: 4.48

International Journal of Immunogenetics

2008 | journal-article

Source:Robert Lambkin-Williams

Influenza vaccines have a short but illustrious history

Influenza Vaccines for the Future

2008 | other

DOI: 10.1007/978-3-7643-8371-8_3

Source:Robert Lambkin-Williams via Crossref Metadata Search

Influenza vaccines have a short but illustrious history

Influenza Vaccines for the Future

2008 | book-chapter

Source:Robert Lambkin-Williams

Lack of evidence for complete resistance of peripheral blood mononuclear cells to HIV-1 and HIV-2 infection

Viral Immunology

2008 | journal-article

DOI: 10.1089/vim.2007.0092

EID: 2-s2.0-41349118395

Source:Scopus - Elsevier

Lack of evidence for complete resistance of peripheral blood mononuclear cells to HIV-1 and HIV-2 infection

Viral immunology

2008 | journal-article

Source:Robert Lambkin-Williams

Pathogenesis of RSV (respiratory syncytial virus) in humans: insights from an experimental adult infection model

Abstract presented at the Pediatric Academic Societies Meeting

2008 | journal-article

Source:Robert Lambkin-Williams

Virucidal Performance of Various Professional Hand Hygiene Products Against Avian Influenza A H5N1

American journal of infection control

2007-06 | journal-article

DOI: 10.1016/j.ajic.2007.04.027

URI: <https://linkinghub.elsevier.com/retrieve/pii/S0196655307002052>

Source:ScienceOpen, Inc.

Anti-viral Formulations Nanomaterials And Nanoparticles

2007-02 | other

Source:Robert Lambkin-Williams

The threat of avian influenza H5N1: 'do we have the tools for the job'?

Antiviral chemistry & chemotherapy

2007-01 | journal-article

PMID: 17542151

DOI: 10.1177/095632020701800202

Source:Robert Lambkin-Williams via Europe PubMed Central

(EN) VIRUCIDAL MATERIALS (FR) SUBSTANCES VIRUCIDES

PATENTSCOPE

2007 | patent

PAT: PCT/GB2007/000542

Source:Robert Lambkin-Williams

Development of a human experimental infection model of Respiratory Syncytial Virus

Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC) Abstract

2007 | journal-article

Source:Robert Lambkin-Williams

Early clinical evaluation of an RNA interference (RNAi) based therapy for respiratory syncytial virus (RSV) infection

Pediatr Acad Soc

2007 | journal-article

Source:Robert Lambkin-Williams

Flu: Effect of vaccine in elderly care home residents: A randomized trial

Journal of the American Geriatrics Society

2007 | journal-article

DOI: 10.1111/j.1532-5415.2007.01471.x

EID: 2-s2.0-36849091532

Source:Robert Lambkin-Williams*via*Scopus - Elsevier

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American Journal of Therapeutics

2007 | journal-article

DOI: 10.1097/MJT.0b013e3180a7206e

EID: 2-s2.0-34748925844

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Respiratory Research

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EID: 2-s2.0-34250316096

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DOI: 10.1097/MJT.0b013e3180a6f9c2

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Vaccine

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DOI: 10.1016/j.vaccine.2004.06.035

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Antiviral Chemistry and Chemotherapy

2005 | journal-article

EID: 2-s2.0-23244438368

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International Congress Series

2004 | journal-article

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International Congress Series

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