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Antibody responses in humans after infection with avian influenza viruses

Project Number
5R01AI128821-03

Contact PI/Project Leader
KRAMMER, FLORIAN

Awardee Organization
ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI

Description

Abstract Text

Abstract Humans are frequently exposed to seasonal influenza viruses like H1N1, H3N2 and influenza B viruses. However, infections with avian influenza viruses like H5N1 or H7N9 are rare. So far it is unclear how the human immune system reacts to exposure to these viruses, specifically in the context of pre-existing immunity to seasonal influenza virus strains. Preliminary data has shown that in these rare cases antibodies to epitopes that are conserved between human seasonal and avian influenza viruses are boosted. In this collaborative effort between the Xu laboratory (Fudan University, Shanghai, China) and the Krammer laboratory (Icahn School of Medicine at Mount Sinai, New York, USA) we propose to investigate the human antibody response after natural infection with avian influenza viruses. Antibody responses will be characterized at three levels. Initially we will assess the reactivity and functionality of polyclonal serum responses of humans naturally infected with H7N9 viruses. Then, on an epidemiologic level, we will assess the cross-reactivity of 'at risk' cohorts (wet market vendors, bird handlers, farmers etc.) to get insights into the prevalence of exposure to avian influenza viruses. Finally, we will zoom in to characterize the epitope usage of monoclonal antibodies induced after infection with avian influenza viruses. The data obtained from this study will guide the design of novel broadly protective and **pandemic** influenza virus vaccines and will significantly enhance our **pandemic** preparedness.

Public Health Relevance Statement

Narrative Infection with avian influenza virus is an unusual challenge for the human immune system and the antibody response to these rare infections is poorly understood. Here we will analyze the polyclonal and monoclonal antibodies induced by natural infection with avian influenza viruses in humans. The obtained data will guide future vaccine design and will enhance pandemic preparedness.

NIH Spending Category

Biodefense Biotechnology Emerging Infectious Diseases Immunization Infectious Diseases Influenza Pneumonia & Influenza Prevention Vaccine Related

Project Terms

Antibodies Antibody Response Antigens Avian Influenza A Virus Birds China Chinese People Data Data Set Development Enzyme-Linked Immunosorbent Assay Epidemiology Epitopes Exposure to Far East Frequencies Future Glycoproteins Hemagglutinin Human Immune response Immune system Immunity Individual Infection Influenza A Virus, H1N1 Subtype Influenza A Virus, H5N1 Subtype Influenza A Virus, H7N9 Subtype Influenza B Virus Knowledge Laboratories Measures Membrane Glycoproteins Monoclonal Antibodies Neuraminidase

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ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI

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Department Type
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Organization Type
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State Code
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Congressional District
13

Other Information

FOA
RFA-AI-16-006
Study Section
Special Emphasis Panel[ZRG1-IDM-W(50)R]
Fiscal Year
2019
Award Notice Date
10-December-2018

Administering Institutes or Centers
NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES
DUNS Number
078861598
CFDA Code
855

Project Start Date
10-January-2017
Project End Date
31-December-2021
Budget Start Date
01-January-2019
Budget End Date
31-December-2019

Project Funding Information for 2019

Total Funding
$200,000
Direct Costs
$117,994
Indirect Costs
$82,006

Year	Funding IC	
2019	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	$200,000

NIH Categorical Spending

Click here for more information on NIH Categorical Spending

Funding IC	FY Total Cost by IC	NIH Spending Category
NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	$200,000	Biodefense; Biotechnology; Emerging Infectious Diseases; Immunization; Infectious Diseases; Influenza; Pneumonia & Influenza; Prevention; Vaccine

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ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI

Publications

No Publications available for 5R01AI128821-03

Patents

No Patents information available for 5R01AI128821-03

Outcomes

The Project Outcomes shown here are displayed verbatim as submitted by the Principal Investigator (PI) for this award. Any opinions, findings, and conclusions or recommendations expressed are those of the PI and do not necessarily reflect the views of the National Institutes of Health. NIH has not endorsed the content below.

No Outcomes available for 5R01AI128821-03

Clinical Studies

No Clinical Studies information available for 5R01AI128821-03

News and More

Related News Releases

No news release information available for 5R01AI128821-03

History

No Historical information available for 5R01AI128821-03

Similar Projects

No Similar Projects information available for 5R01AI128821-03