Back to Search Results

Description
Details
Sub-Projects
Publications
Patents
Outcomes
Clinical Studies
News and More
History
Similar Projects

Simultaneously boosting both humoral and cellular immunity following vaccination

Project Number
5R01AG047156-06

Contact PI/Project Leader
SUN, JIE

Awardee Organization
MAYO CLINIC ROCHESTER

Share

Description

Abstract Text

DESCRIPTION (provided by applicant): In this application, we hypothesize that two reciprocally regulated transcriptional factors, Sox4 and IRF4, play a central role in determining the quantity and quality of both murine and human cytotoxic T lymphocyte (CTL) responses. In addition, we will test the hypothesis that the dysregulated balance between IRF4 and Sox4 (i.e. diminished IRF4 and enhanced Sox4 expression) in CD4 and CD8 T cells impairs the development of Tfh and CTL responses in aged individuals, thereby leading to the age-associated defects in both humoral and cellular immunity following influenza vaccination. The goals of this application are to dissect the molecular mechanisms by which effective anti-viral CTL responses are induced during influenza infection, and to use immunological and pharmacological tools to simultaneously boost cellular and humoral immunity to increase influenza vaccine efficacy in aged individuals. Two specific Aims are proposed. Aim1: To elucidate the mechanisms by which the Sox4-IRF4 circuit controls the quantity and quality of anti-viral CTL responses during influenza infection. Aim 2: To define the T cell intrinsic role of PGE2/TGF-�ependent Sox4-IRF4 regulation in age-associated defects in humoral and cellular immunity following influenza vaccination. Relevance statement Seasonal influenza kills ~500,000 people globally and up to 50,000 people in the United States each year, most of deaths occur in the elderly. CD8 CTLs are required for efficient clearance of influenza virus infection and the levels of pre-existing CD8 CTLs in humans tightly correlate with the protection against symptomatic **pandemic** influenza. Thus, understanding the transcriptional programs regulating the efficient development of CTL responses during influenza infection and immunization has the potential for designing future influenza therapeutics and for improving influenza vaccine design. In addition, a major problem in influenza prevention is that elderly adults respond poorly to current influenza vaccines. As a result, even in a population with a high rate of influenza vaccination, influenza infection causes 10- to 30- times more hospitalizations in the elderly annually compared to younger individuals. Therefore, the successful completion of this application will shed light on the molecular basis underlying the age-associated defects in both humoral and cellular immunity following influenza vaccination. Furthermore, we expect that this application will establish principles that could be utilized in the future to improve the effiacy of influenza and other pathogen vaccines in aged individuals.

Public Health Relevance Statement

PUBLIC HEALTH RELEVANCE: Influenza virus is the leading cause of upper and lower respiratory infection, and constitutes an ongoing threat to global health. The goals of this application are to dissect the molecular mechanisms by which effective anti-viral CTL responses are induced during influenza infection, and to use immunological and pharmacological tools to simultaneously boost cellular and humoral immunity to increase influenza vaccine efficacy in aged individuals.

NIH Spending Category

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

Project Terms

Adult Age Antibody Affinity Antiviral Agents CD8-Positive T-Lymphocytes CD8B1 gene Cells Cellular Immunity Cessation of life Cytotoxic T-Lymphocytes Data Defect Development Dinoprostone Elderly Environment Equilibrium Future Generations Genetic Transcription Goals Hospitalization Human Humoral Immunities IRF4 gene Immune response Immunity Immunologics Impairment Individual Influenza Influenza Therapeutic Influenza prevention Influenza vaccination Light Lower Respiratory Tract Infection Mediator of activation protein Molecular Mus Pharmacology Play Population Prevention Production Publishing Regulation Role SOX4 gene

Read More

Details

Contact PI/ Project Leader

Other PIs

Program Official

Thank you for your feedback!

Back to Search Results

Description
Details
Sub-Projects
Publications
Patents
Outcomes
Clinical Studies
News and More
History
Similar Projects

Simultaneously boosting both humoral and cellular immunity following vaccination

Project Number
5R01AG047156-06

Contact PI/Project Leader
SUN, JIE

Awardee Organization
MAYO CLINIC ROCHESTER

Organization

Name
MAYO CLINIC ROCHESTER

City
ROCHESTER

Country
UNITED STATES (US)

Department Type
Unavailable

Organization Type
Other Domestic Non-Profits

State Code
MN

Congressional District
01

Other Information

FOA
PA-13-302

Study Section
Cellular and Molecular Immunology - B Study Section[CMIB]

Fiscal Year
2019

Administering Institutes or Centers
NATIONAL INSTITUTE ON AGING

DUNS Number
006471700

CFDA Code
866

Award Notice Date
28-June-2019

Project Start Date **01-February-2017**

Project End Date **31-May-2021**

Budget Start Date **15-June-2019**

Budget End Date **31-May-2021**

Project Funding Information for 2019

Total Funding
$325,950

Direct Costs
$205,000

Indirect Costs
$120,950

Year	Funding IC	FY Total Cost by IC
2019	NATIONAL INSTITUTE ON AGING	$325,950

NIH Categorical Spending

Click here for more information on NIH Categorical Spending

Funding IC	FY Total Cost by IC	NIH Spending Category
NATIONAL INSTITUTE ON AGING	$325,950	Aging; Biodefense; Emerging Infectious Diseases; Immunization; Infectious Diseases; Influenza; Pneumonia & Influenza; Prevention; Vaccine Related;

Sub Projects

No Sub Projects information available for 5R01AG047156-06

Publications

No Publications available for 5R01AG047156-06

Patents

No Patents information available for 5R01AG047156-06

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 5R01AG047156-06

Back to Search Results

Description
Details
Sub-Projects
Publications
Patents
Outcomes
Clinical Studies
News and More
History
Similar Projects

Simultaneously boosting both humoral and cellular immunity following vaccination

Project Number	Contact PI/Project Leader	Awardee Organization
5R01AG047156-06	SUN, JIE	MAYO CLINIC ROCHESTER

News and More

Related News Releases

No news release information available for 5R01AG047156-06

History

No Historical information available for 5R01AG047156-06

Similar Projects

No Similar Projects information available for 5R01AG047156-06

Thank you for your feedback!