Synergy Center

The University of Osaka, Center for Advanced Modality and DDS :CAMaD

Japan Initiative for World-leading Vaccine Research and Development Centers

Synergy Center Overview

Director.
Shizuo AKIRA

World-class researchers in the field of infectious diseases from within and outside Osaka University have gathered at CAMaD. By utilizing common facilities with cutting-edge equipments such as BSL3 facility and genome analysis laboratory, they are working on the research and development of new vaccines by seamlessly linking basic research on infectious diseases and immunity to clinical practice.

Vision

Protecting people from infectious diseases and their pandemics

Mission

Research and clinical development for practical application of vaccines against priority infectious diseases

R&D Goal 1	Development of mRNA vaccines with high safety and low adverse reactions
R&D Goal 2	Development of vaccines with superior durability of effects in infection protection and prevention of severe disease
R&D Goal 3	Establishment of a foundation for responding to various priority infectious diseases and various prototype vaccines

Vaccine development

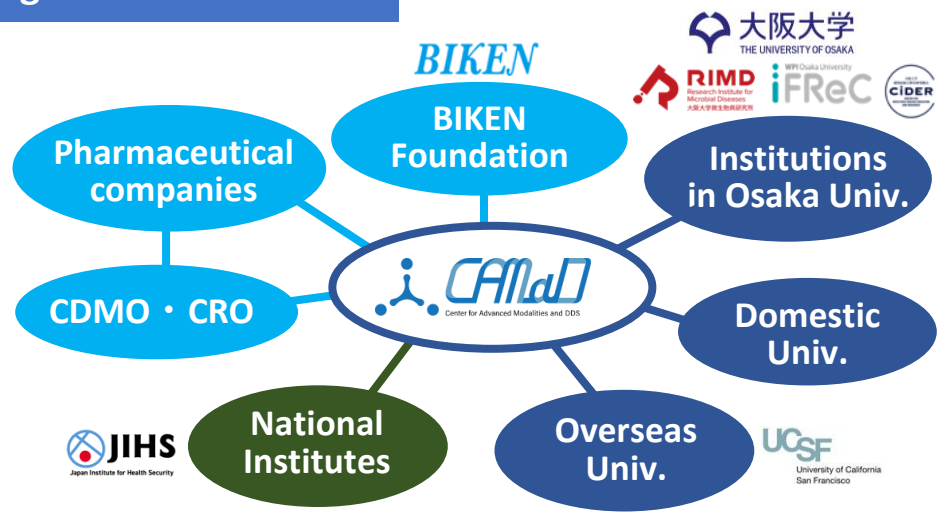
Vaccine

Pathogen	Characteristics
Avian influenza virus	・mRNA vaccine ・Reduced adverse reactions
SARS-CoV-2	・Peptide vaccine ・High safety and sustainability
Lassa virus	・mRNA vaccine ・Heat stability
SFTS virus	・mRNA vaccine
Enterovirus	・Live attenuated vaccine ・mRNA vaccine

Modality

Modality	Characteristics
Low-Inflammatory LNP	・Reduced adverse reactions
LNP formulated using an original inline formulation technology	・Stabilized LNP preparations ・Improved LNP production efficiency

Organization structure



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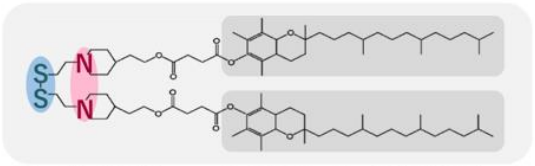
R&D Overview

Research Teams	Mission (Peacetime)
mRNA	Development of mRNA vaccine technology
DDS/Adjuvant	Development of DDS and adjuvants
Vaccine evaluation	Evaluation of vaccine efficacy and side effects in animal models
Epitope	Efficient identification of neutralizing antibody epitopes
Virus analysis	Establishment of a diverse vaccine library based on knowledge of RNA viruses
Immunity /Pathogen Interactions	Understanding host-pathogen interactions and designing optimal vaccine antigens for inducing neutralizing antibodies
Genome analysis	Identification of susceptibility factors for infectious diseases and/or vaccines
Clinical	Evaluation of vaccines in humans (Clinical trials)
Vaccine practical application	Development of various vaccines for practical application
Global epidemic intelligence	Development of global epidemic intelligence system and creation of emergency vaccine action plan

Progress in vaccine development

■ **Development of low-inflammatory mRNA vaccines based on a lipid material "ssPalm"**



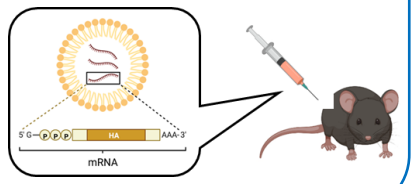
Prof. Akita
Tohoku Univ/
CAMaD

Akita H. ***Biol Pharm Bull*** 2020, 43: 1617-1625.

ssPalm: ss-cleavable and pH-activated lipid-like material

■ **Development of mRNA vaccines against highly pathogenic H5N1 avian influenza virus using the LNPssPalmO**

H5 HA mRNA-LNPssPalmO vaccine has an equivalent vaccine efficacy with reduced inflammatory cytokine production compared to an existing LNP product.



■ **Development of low-inflammatory mRNA vaccines against Lassa virus**

LASgpc- or LCMnp-mRNA-LNP protected mice from a lethal challenge with rLCMVs