working groups and by maintaining regular liaison and routine coordination with local and state law enforcement and intelligence agencies.

Applicable regulations and national consensus standards governing emergency response and post-emergency response operations conducted at criminal or terrorist incidents involving hazardous materials or attack on oil, chemical and petrochemical industry.

Key words: Industry safety, chemical warfare, safety procedure, first response

HR0700073

58. ADENOVIRUS-VECTORED VACCINE AS A RAPID-RESPONSE TOOL AGAINST AVIAN INFLUENZA PANDEMIC *(2)*

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Influenza viruses in nature undergo genetic mutation and reassortment. Three pandemics of avian influenza in man were recorded in the twentieth century. Highly pathogenic avian influenza (HPAI) viruses currently in circulation pose a threat for another world-wide pandemic, if they become transmissible from man to man. Manufacturing protective vaccines using current egg-based technology is often difficult due to the virulence of the virus and its adverse effects on the embryonating egg substrate. New technologies allow the creation of safe and protective pandemic influenza vaccines without the need for egg based substrates.

These technologies allow new vaccines to be created in less than one month. Manufacturing is in tissue culture, not eggs. Vaccine can be administered to man non-invasively, without adjuvants, eliciting a rapid and protective immune response.

Protective immunity against avian influenza (AI) virus was elicited in chickens by single-dose *in ovo* vaccination with a replication-competent adenovirus (RCA)-free human adenovirus serotype 5 (Ad5)-derived vector encoding an H5N9 avian influenza virus hemagglutinin. Vaccinated chickens were protected against both H5N1 and H5N2 HPAI virus challenges. Mass-administration of this bird flu vaccine can be streamlined with available robotic *in ovo* injectors. Vaccination using this vaccine could protect the the largest host reservoir (chickens) and greatly reduce the exposure of man to avian influenza. In addition, Ad5-vectored vaccines can be produced rapidly and the safety margin of a non-replicating vector is superior to that of a replicating counterpart. Furthermore, this mode of vaccination is compatible with epidemiological surveys of natural AI virus infections.

In addition to mass immunization of poultry, both animals and humans have been effectively immunized by intranasal administration of Ad5-vectored influenza vaccines without any appreciable side effects, even in mice and human volunteers with preexisting immunity to Ad5. RCA-free Ad5-vectored AI vaccines may thus provide a critical tool for mitigating an AI pandemic in a simple, rapid, and safe manner.

Key words: avian influenza, in-ovo vaccine, nasal vaccine, adenovirus-vectored vaccine, replication-competent adenovirus

HR0700074

59. NON-REPLICATING ADENOVIRUS-VECTORED ANTHRAX VACCINE *(6)*

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As bioterrorism is emerging as a national threat, it is urgent to develop a new generation of anthrax vaccines that can be rapidly produced and mass administered in an emergency setting. We have demonstrated that protective immunity against anthrax spores could be elicited in mice by intranasal administration of a non-replicating human adenovirus serotype 5 (Ad5)-derived vector encoding Bacillus anthracis protective antigen (PA) in a single-dose regimen. The potency of an Ad5 vector encoding PA was remarkably enhanced by codon optimization of the PA gene to match the tRNA pool found in human cells. This nasal vaccine can be mass-administered by non-medical personnel during a bioterrorist attack.

In addition, replication-competent adenovirus (RCA)-free Ad5-vectored anthrax vaccines can be mass produced in PER.C6 cells in serum-free wave bioreactors and purified by column chromatography to meet a surge in demand. The non-replicating nature of this new generation of anthrax vaccine ensures an excellent safety profile for vaccinees and the environment.

HR0700075

60. ANTIDOTAL EFFICACY OF A NEW COMBINATION IN TREATMENT OF SUBACUTE T-2 TOXIN POISONING IN RATS *(12)*

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Trichothecene mycotoxin, T-2 toxin is a natural metabolite of *Fusarium fungi*. T-2 toxin possesses several properties (significant persistence in the environment, cheap manufacture, difficult detection and absence of a specific antidote) that make it a very dangerous potential chemical warfare agent. In our previous experiments, nonsteroidal anti-inflamatory drug (NSAID) nimesulide (NIM), as a selective COX-2 inhibitor, and zeolite absorbent (Min-a-zel Plus®, MIN+) administered separately showed a good protective effects against general toxicity induced by T-2 toxin (T2).

The aim of this study was to evaluate the antidotal potential of the combination of these two