Klebsiella pneumoniae capsule polysaccharide conjugated vaccines

(Below is limited to 1-page only; be careful not to disclose vital technology content. Please delete these words when the document is finished)

PI： Professor Jin-Town Wang

Department of Microbiology, National Taiwan University College of Medicine

Experience:

http://microbes.mc.ntu.edu.tw/main.php?Page=SA4B1&KeyID=5010582684577dce9586e4&Template=teacher02.php

Market Needs:

Klebsiella pneumoniae is an important pathogen causing community-acquired infections such as pneumonia and pyogenic liver abscess. *K. pneumoniae* is also responsible for approximate 10% of nosocomial infections with increasing resistances to antibiotics. The predominant capsular types of *K. pneumoniae* causing community-acquired infections such as pyogenic liver abscess and pneumonia were capsular type K1 and K2. Our recent study reported that the capsular types K64 (38%), K62 (13%), K24 (8%), KN2 (7%) and K28 (6%) account for 72% of carbapenem resistant *K. pneumoniae*.

Our Technology:

The molecular weights of *K. pneumoniae* capsule polysaccharides (CPS) are very large and make conjugation vaccine difficult. We have tried chemical and physical methods to cut CPS and found modifications as well as antigenicity in some capsular types will be lost after treatments. Therefore, we isolated more than 20 depolymerases (ex. K1, K2, K64, K62 etc.) that can digest CPS with modifications and antigenicity intact. Using the digested CPS conjugated to CRM197, we successfully made conjugated vaccines for several capsular types of *K. pneumoniae*. Immunization in mice showed conjugate vaccines could induce CPS antibodies with bactericidal activities (ex. K1 with 1/128 bactericidal titer). Animal challenge tests demonstrated conjugate vaccine could protect mice from subsequent infection of *K. pneumoniae* (ex. 10^4 cfu of K1, >100×LD50).

Strength:

Using CPS depolymerase digested oligosaccharides, instead of chemical reduced oligosaccharides, will produce vaccine with stable quality.

Competing Products:

There was no available *K. pneumoniae* vaccine until now.

Intellectual Properties:

US provisional patent 62/403,365

Contact (do not need to fill out):

Center for Industry-Academia Collaboration, NTU

Tel: 02-3366-9945, E-mail: ordiac@ntu.edu.tw