

National Institute of Virology (NIV), Pune

Japanese Encephalitis Vaccine

Product/Process: Chimeric peptide vaccine candidate against Japanese Encephalitis virus.

Application/Uses: Japanese encephalitis virus is endemic in many areas of India. Chimeric peptide sequences can be incorporated in the future vaccines.

Salient Technical Features: Using combination of bioinformatic tools and immunological studies, peptide sequences inducing neutralizing antibodies and T helper activity in mice were identified. Chimeric peptides incorporating both these epitopes showed induction of immunity against JE virus and partial protection from lethal challenge in mouse model.

Scale of Development: The project was a collaborative effort between National Institute of Virology, Pune, and Bioinformatics Centre, University of Pune, with funding from Department of Biotechnology, New Delhi. It is developed up to laboratory scale.

Status of Commercialization: Four international patents were filed in USA (Application no. 10/250,468), Korea and Japan and Philippines and one national phase application was filed in India based on PCT application (Application no. PCT/INO2/0003). Negotiation are in progress with Hyderabad based Company M/s Bharat Biotech India Ltd. for commercializing this technology.

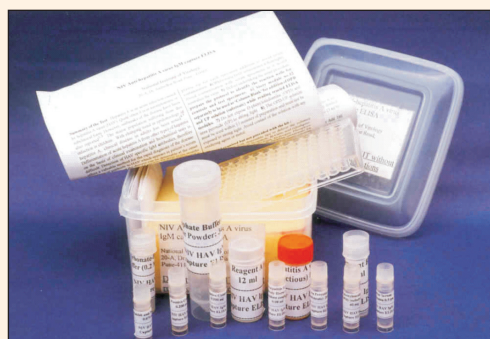
Diagnostic for Japanese Encephalitis, Dengue and West Nile Viruses

Product/Process: MAC ELISA kit for the diagnosis of Japanese Encephalitis (JE), Dengue (DEN) and West Nile (WN) viruses.

Application/Uses: It is used for diagnosis of JE, WN and DEN viral infections, which are of great public health importance. They are highly sensitive (96%) and specific.

Salient Technical Features: The technique is based on micro plate IgM ELISA which detects virus specific IgM antibody. The probe incorporated in current MAC ELISA is useful for detection of infection of three flaviviruses (JE/WN/DEN).

Flaviviruses have several common antigenic determinants and classical tests like haemagglutination inhibition (HI) and complement fixation (CF) showed significant cross reaction thereby giving ambiguous diagnosis but ELISA test does not require any pretreatment of the sample.



Scale of Development: Kits are regularly supplied to research institutes in India and to the WHO.

Status of Commercialization: The technology has been transferred to Zydus Cadila, Mumbai.

Diagnostic for Hepatitis A

Product/Process: Diagnostic kit for detection of IgM anti-hepatitis A (HAV) and total antibodies to HAV.

Application/Uses: It is useful for detection of IgM anti-HAV antibodies for diagnosis of recent and past infections of hepatitis A, and in seroepidemiological studies and viral hepatitis surveillance. It is also used for detection of HAV specific antigen.

Salient Technical Features: This is the first indigenously developed hepatitis A diagnostic kit. The technology utilizes tissue culture grown HAV that provides a steady source of relatively clean preparation of virus (HAV) free from bacterial or other viral contaminants. The indigenous production of the following major components has been achieved:

- Rabbit IgG against human IgM

- Anti-HAV IgG from serum of HAV infected human/rhesus monkey
- HAV antigen
- HRP based immunoconjugate linked to purified anti-HAV IgG. The reagents of the kits are stable for 6 months.

Scale of Development: The technology has been developed up to laboratory scale.

Status of Commercialization: The technology has been transferred to Bharat Biotech International Ltd., Hyderabad.

Vaccine for Hepatitis A

Product/Process: Vaccine candidate against hepatitis A.

Application/Uses: MRC-5/VERO cell culture adapted Indian isolate of hepatitis A for the preparation of hepatitis A vaccine. The indigenous vaccine preparation can be useful to high risk groups such as:

- Children from high socio-economic status
- Young food handlers
- Sibling of hepatitis A patients
- HBV/HCV carrier children.

Salient Technical Features: A strain of hepatitis A virus was isolated from fecal sample of a patient. The isolation and adaptation of virus was carried out in BGMK cell line. The adapted strain of HAV was designated as NIVIN 97. The strain was further adapted to VERO cell line. It showed strong positive reactions in ELISA tests employed for detection of anti-HAV antibodies. Additionally, immune microscopy was performed at different passage levels and full virus particles detected.

Scale of Development: The technology has been developed up to laboratory scale.

Status of Commercialization: An agreement has been signed between National Institute of Virology, Pune (ICMR) and Bharat Biotech International Ltd. (BBIL), Hyderabad, for the transfer of MRC- 5/VERO cell culture adapted from Indian isolate of hepatitis A virus for the preparation of hepatitis A vaccine.

Kyasanur Forest Disease Vaccine

Product/Process: Kyasanur Forest Disease (KFD) vaccine.

Application/ Uses: This vaccine has been primarily used in health care system for KFD restricted to the state of Karnataka, India.

Salient Technical Features: An inactivated vaccine is prepared using KFD virus in chick embryo culture (CEC). Clinical trials for this were conducted by NIV, Pune.

Scale of development: The technology has been developed at laboratory scale and production would be done at Virus Diagnostic Laboratory (VDL), Shimoga, Karnataka.

Status of Commercialization: The technology has been transferred to VDL, Shimoga for production for Karnataka Government. The NIV also maintained instruments and logistic support to VDL, Shimoga up to 1998. Currently, vaccine production is carried out at Karnataka Govt. owned autonomous Veterinary Vaccine Production Unit at Hebbal. Safety of the vaccine is being tested at VDL, Shimoga.

Diagnostic for Rotavirus

Product/Process: Diagnostic kit for rotavirus.

Application/Uses: It is used for detection of rotavirus from the fecal samples of diarrhoea patients.

Salient Technical Features: The rapid ELISA test was developed at NIV, Pune. It is easy to perform, has high sensitivity and specificity and is cost effective as large number of fecal samples could be tested using indigenously developed reagents. This can essentially avoid unnecessary use of antibiotics in diarrhoea patients. This kit is also useful during surveillance studies to obtain data on disease burden.

Scale of Development: It has been developed up to laboratory scale.

Status of Commercialization: An Indian patent (no. 187163) was granted. Negotiation for technology transfer with BBIL, Hyderabad is on.

Rotaviral Diarrhoea Treatment

Product/Process: Immune goat colostrum against rotavirus.

Application/ Uses: Hyperimmune goat colostrum is useful in inducing passive immunity against rotaviruses among children. It is effective in reducing the duration and severity of childhood diarrhoea due to rotavirus. It also serves as an enriched food for babies.

Salient Technical Features: Anti-rotavirus antibody titers as assessed by ELISA and neutralization test are significantly high in hyper immune goat colostrum. Spray dried powder of hyperimmune goat colostrum retain anti-rotavirus antibodies which can be suitably used as baby food supplement.

Scale of Development: It has been developed up to laboratory scale.

Status of Commercialization: An US patent entitled "The preparation of immune goat colostrum against rotavirus" (Application no. 10/100.165) has been filed.

Mosquito Repellent Device

Product/Process: Insect repellent device.

Application/Uses: It is used as mosquito repellent where no electricity is available, particularly in rural areas.

Salient Technical Feature: This device comprises of holding arrangements provided with a plurality of connecting means which is made of metals. A curved metal plate of 2-5 cm of diameter has been held by these connecting means. Heating source is placed at a distance of 1.0 to 10 cm from the metal plate.

Scale of Development: It has been developed up to laboratory scale.

Status of Commercialization: An Indian patent has been granted. (Patent no. 195269).