

A Review on Banana Edible Vaccine against Hepatitis B

Mrugasha G. Desale, Jidnyasa S. Farde, Jagruti V. Kumbhar

Samarth Institute of Pharmacy, Belhe, Pune, Maharashtra, India

Abstract: *Hepatitis B is a disease which has caused major loss of life over the years. The treatment for the disease is very expensive and cure rate is less. Due to its high cost developing or underdeveloped countries are far out of reach from treatment to hepatitis B. There are vaccines produced against this disease but its cost has limited the use by the masses. In the recent years the plant based vaccines called edible vaccines which are cheap compared to the traditional vaccines have been current area of research. Due to its high cost developing or underdeveloped countries are far out of reach of treatment to hepatitis B. There are vaccines produced against this disease but its cost has limited the use by the masses. In the recent years, the plant based vaccines called edible vaccines which are cheap compared to the traditional vaccines have been current area of research. Edible vaccines using banana have been prepared for Hepatitis B but in this hypothetical paper we have put forward our idea on preparing edible banana vaccine for Hepatitis B thorough a different methodology. We hypothesised to increase the expression level of the transgene by using pBIN19 as a vector instead of traditional Agrobacterium Ti plasmid. The paper also focuses on mechanism of the mode of action of vaccine along with advantages, disadvantages, challenges and future prospects of edible banana vaccine.*

Keywords: Hepatitis B, Banana Vaccine, Edible Vaccine, PBIN19.

REFERENCES

- [1]. Chaitanya VK, Kumar JU (2006) Edible vaccines. Sri Ramachandra J Med 1:33-34. Link: <http://bit.ly/2NvTq3b>.
- [2]. Yusibov V, Hooper DC, Spitsin SV, Fleysh N, Kean RB, et al. (2002) Expression in plants and immunogenicity of plant virus-based experimental rabies vaccine. Vaccine 20: 3155-3164. Link: <http://bit.ly/34m38f3>
- [3]. Kapusta J, Modelska A, Figlerowicz M, Pniewski T, Letellier M, et al. (1999) A plant-derived edible vaccine against hepatitis B virus. FASEB J13: 1796-1799. Link: <http://bit.ly/338D9Yh>
- [4]. Richter LJ, Thanavala Y, Arntzen CJ, Mason HS (2000) Production of hepatitis B surface antigen in transgenic plants for oral immunization. Nat Biotechnol 18: 1167-1171. Link: <http://bit.ly/2oJIKGY>
- [5]. Prakash C (1996) Edible vaccines and antibody producing plants. Biotechnol Dev Monit 27: 10-13. Link: <http://bit.ly/36qRkKE>.
- [6]. Waghulkar V (2010) Fruit derived edible vaccines: Natural way for the vaccination. Int J PharmTech Res 2: 2124-2127. Link: <http://bit.ly/36rtK07>
- [7]. Dus Santos MJ, Wigdorovitz A, Trono K, Ríos RD, Franzone PM, et al. (2002) A novel methodology to develop a foot and mouth disease virus (FMDV) peptide-based vaccine in transgenic plants. Vaccine 20: 1141-1147. Link: <http://bit.ly/36oHTLy>
- [8]. Domansky N, Ehsani P, Salmanian AH, Medvedeva T (1995) Organ-specific expression of hepatitis B surface antigen in potato. Biotechnology letters 17: 863-866. Link: <http://bit.ly/2pCD7JV>
- [9]. Kay RF, Madden RH, Van Schaik C, Higdon D (1997) Primate species richness is determined by plant productivity: implications for conservation. Proc Natl Acad Sci 94: 13023-13027. Link: <http://bit.ly/327QajB>.
- [10]. Tanghe A, Van Dijck P, Thevelein JM (2006) Why do microorganisms have aquaporins? Trends Microbiol 14: 78-85. Link: <http://bit.ly/2PFc1fC>
- [11]. Arntzen CJ (1997) Edible vaccines. Public Health Rep 112: 190-197. Link: <http://bit.ly/2NBTazu>
- [12]. Tripurani SK, Reddy NS, Rao KRS (2003) Green revolution vaccines, edible vaccines. Afr J Biotechnol 2: 679-683. Link: <http://bit.ly/326ENbU>

- [13]. Daniell H (2007) Chloroplast transgenic approach to express and purify human serum albumin, a protein highly susceptible to proteolytic degradation.
- [14]. Hassler S (1995) Bananas and biotech consumers. *Bio/Technology* 13: 417.
- [15]. Fischer R, Emans N (2000) Molecular farming of pharmaceutical proteins. *Transgenic res* 9: 279-299. Link: <http://bit.ly/339kM5I>
- [16]. Ramsay AJ, Kent SJ, Strugnell RA, Suhrbier A, Thomson SA (1999) Genetic vaccination strategies for enhanced cellular, humoral and mucosal immunity. *Immunol Rev* 171: 27-44. Link: <http://bit.ly/2WC8Gzn>
- [17]. Phoolcharoen W, Bhoo SH, Lai H, Ma J, Arntzen CJ, et al. (2011) Expression of an immunogenic Ebola immune complex in *Nicotiana benthamiana*. *Plant Biotechnol J* 9: 807-816. Link: <http://bit.ly/2qbijJo> Link: <https://go.nature.com/2oDjEbs>
- [18]. Tacket CO, Mason HS, Losonsky G, Clements JD, Levine MM, et al. (1998) Immunogenicity in humans of a recombinant bacterial antigen delivered in a transgenic potato. *Nature med* 4: 607-609. Link: <https://go.nature.com/2NyMfHl>.
- [19]. Bhattacharya, D.; Thio, C.L. Review of Hepatitis B Therapeutics. *Clin. Infect. Dis.* 2010, 51(10), 1201-1208.
- [20]. Coleman, P.F. Detecting hepatitis B surface antigen mutants. *Emerg. Infect. Dis.* 2006, 12(2), 198-203.