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Correct L1 initiation codon generates immunologically reactive virus-like particles of a novel laboratory mouse papillomavirus (MusPV)

A. Bennett Jenson
University of Louisville, USA

Abstract

Correctly assembled virus-like particles (VLPs) of papillomavirus (PV) display conformationally-dependent epitopes that are type-specific, maintained on authenic virions and induce neutralizing antibodies. Alignment of the L1 amino acid (aa) sequences of 84 PVs revealed that the lengths of their N-termini are diverse and multiple possible initiation methionine (met) codons exist. The L1 gene of MusPV, that naturally infects immunodeficient laboratory mouse strain (NMRI-Foxn1nu/Foxn1nu), has 4 met codons at 1st, 2nd, 28th and 30th aa from its N-terminus. Of these, the 3rd and 4th mets, that are at 28th and 30th aa position from the N-termius, respectively, are located at the position where most PVs have their start codon. These two mets, located 9th and 11th from the YLPP conserved aas of most PVs, should be considered as consensus initiation codons of PV L1s. Three L1 proteins of MusPV starting from 2nd, 3rd and 4th mets expressed using baculovirus expression system were characterized for their ability to self-assemble into VLPs. While MusPV L1 proteins starting from 2nd met expressed a L1 protein that rarely folded into VLPs, the L1s starting from 3rd and 4th mets generated correct VLPs in abundant quantities. We now conclude that the highest quantity and best quality VLPs are made from the consensus L1 met of all known PVs

Biography

Dr. Jenson is a board-certified human pathologist with expertise in animal models of human disease (Distinguished Professor Lectureship 11th Annual Pathology of Mouse Models of Human Disease, September 2012). He has worked with murine leukemia virus infection of NZB/NZW mice as a model for lupus erythematosus (Scripps Clinic and Research Foundation, CA), murine animal models for virus-induced diabetes mellitus (National Institutes of Health), and animal models for human papillomavirus induced cervical, anogenital other than cervical, and head and neck cancers at Georgetown University Medical Center (Washington DC) and University of Louisville Health Science Center (Louisville, Ky). Presently he is a Professor of Vaccinology at James Graham Cancer Center, where he is working on recombinant tobacco plant papillomavirus vaccines. He has published over 160 peer-reviewed articles, and 40 chapters and books.