

A natural rodent model system for papillomavirus (PV) - induced cancer (P-1168)

Key facts:

- a natural rodent model: immunocompetent and not transgenic
- unique system to investigate PV-associated tumorigenesis (skin tumors and mucosal tumors)
- useful for testing treatment strategies with compounds to inhibit warts and cancer

Abstract

Papillomaviruses (PVs) are small, non-enveloped DNA viruses that are frequently found in animals, particularly in vertebrates such as mammals and birds. Different virus types infect epidermal or mucosal tissues and may cause diverse epithelial lesions ranging from papillomas to carcinoma.

The African multimammate rodent *Mastomys coucha* can be considered as an ideal model for PV-induced skin tumorigenesis. The *Mastomys* population at the German Cancer Research Center (DKFZ) is naturally infected with two distinct PVs: *Mastomys natalensis* papillomavirus (MnPV) which infects the skin and the recently isolated *M. coucha* papillomavirus 2 (McPV2), infecting the epithelium of the anogenital tract. As a consequence of virus infection, the animals spontaneously (within 12 month) develop multiple benign papillomas and keratoacanthomas of the skin as well as at anogenital regions.

The *Mastomys* mouse model provides the only existing natural laboratory model to investigate PV pathogenesis and the immunological setting during tumorigenesis in the skin, ear, eye and tongue as well as to develop prophylactic or therapeutic approaches to prevent those lesions.

Applications / Commercial Opportunity

The inventors have developed a "virus-like particle" (VLP) based vaccine to prevent PV-induced skin lesions. This vaccine is effective under normal and

immunosuppressed conditions. Additionally, it is possible to use the rodent model system to test new compounds to inhibit wart formation and tumorigenesis. DKFZ is seeking for commercial partners and collaborations interested in using this unique model system.

Inventors

The model system was established by scientists of the division of viral transformation mechanisms headed by Prof. Dr. Frank Rösl from the DKFZ, Heidelberg, Germany.

Reference

Vinzon et al., "Protective Vaccination against Papillomavirus-Induced Skin Tumors under Immunocompetent and Immunosuppressive Conditions: A Preclinical Study Using a Natural Outbred Animal Model." [PLoS Pathog. 2014 Feb 20;10\(2\): e1003924.](#)

Nafz et al., "A novel rodent papillomavirus isolated from anogenital lesions in its natural host." [Virology. 2008 Apr 25, 374.](#)

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