

**BIOGRAPHICAL SKETCH**

POSITION TITLE

NAME Kirnbauer, Reinhard	Associate Professor of Dermatology, Chief Laboratory of Viral Oncology, Department of Dermatology, Medical University of Vienna, Waeringer Guertel 18-20, Vienna, Austria
eRA COMMONS USER NAME RKIRNB	
ORCID 0000-0002- 5588-4179	

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)

INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
University of Vienna Medical School	M.D.	1983	Medicine
Residency in General Medicine, Hospital Baden	Gen. Pract.	1986	General Medicine
Residency in Dermatology, Med.Univ.Vienna	Board Certif.	1994	Dermatology
Researcher NIH/NCI/Lab. Cell. Oncol.		1991-1993	Papillomaviruses
Assoc.Prof. of Dermatol. Med.Univ.Vienna (MUV)	Univ.Do.	Since 1995	Dermatology
Laboratory of Viral Oncology, Dermatol., (MUV)	Chief	Since 1994	Papillomaviruses

**A. Personal Statement**

Dr. Kirnbauer acts as chief of the Laboratory of Viral Oncology, and has an appointment as a Professor at the Department of Dermatology. He has a strong interest in translational research and the pathobiology of papillomaviruses. He is recognized for over 20 years of pioneering work on the development of prophylactic human papillomavirus (HPV) vaccines, seroepidemiology, and basic aspects of papillomavirus infection. As co-inventor of HPV16 virus-like particles (VLP) technology with Drs Schiller and Lowy, in 1992 he was the first to describe the assembly from L1 into morphologically correct VLP and the induction of high-level neutralizing antisera. In preclinical animal models he then demonstrated VLP vaccine efficacy in rabbits and cows, which formed the basis of clinical HPV vaccine development. His inventions were licensed by MSD and GSK to permit them to develop and produce the current HPV vaccines, Gardasil and Cervarix. He also developed a VLP-based ELISA that has been widely used in seroepidemiology and vaccination trials. He then moved back to the MUV in Austria and established his own laboratory. Besides basic work on the cellular papillomavirus receptor, he started to develop a vaccine platform based on papillomavirus VLP that carry foreign peptides on their surface, to combat diseases like Alzheimer disease or Prion-related diseases. He also collaborates with the Veterinary Med. Univ. Vienna developing vaccines against papillomavirus-induced neoplasms in horses. He recognizes the need to expand the coverage of prophylactic HPV vaccines to cover all oncogenic types and he joined efforts with Richard Roden at JHU to develop broadly protective HPV vaccines by combining L1 VLP with the conserved protective epitope of L2 defined by the RG-1 monoclonal antibody. His long-standing experience in HPV vaccine development and leadership skills enable him to serve as co-PI in this project.

**B. Positions and Honors****Positions and Employment**

1988-1994 Resident, Department of Dermatology, Medical University Vienna (MUV), Austria  
 1991-1993 Researcher at DCBDC, National Cancer Institute, Bethesda, MD  
 1994-1995 Assistant Professor, Department of Dermatology, Medical University Vienna  
 1995-present Associate Professor, Department of Dermatology, Medical University Vienna

**Other Experience and Professional Memberships**

1988 Austrian Society of Dermatology (ÖGDV)  
 1988 Society for Dermatological Research (ADF)  
 1988 Austrian Society of Allergology and Immunology (ÖGAI)  
 1989 Society for Investigative Dermatology (SID)

- 1997–1999 Member of the 'group of experts' for the ADF  
1999–2003 Board of directors for the ADF (Arbeitsgemeinschaft dermatologische Forschung)  
2007-present Board member Working group for sexually transmitted infections (AG-STD) for the Austrian Society of Dermatology and Venerology  
2009 Scientific Committee 25th International Papillomavirus Conference 2009, Malmö, Sweden  
2009 – 2017 Associate Editor Journal of Investigative Dermatology (JID)  
2017-dato Editorial Consultant Journal of Investigative Dermatology (JID)

### **Honors**

- 1990 AESCA prize - Austrian Society of Dermatology  
1993 UNILEVER prize - Austrian Society of Dermatology  
1994 AESCA prize - Austrian Society of Dermatology  
1996 Theodor-BILLROTH-prize 'Ärztchamber für Wien'  
2006 Ferdinand von HEBRA prize - Austrian Society of Dermatology  
2007 Excellence in Technology Transfer by the Federal Laboratory Consortium (FLC, USA) - Gardasil: A New Era in Cancer Prevention  
2015 Inventor of the Year 2014, Medical University Vienna  
2016 International League of Dermatological Societies (ILDS) Certificate of Appreciation

### **C. Selected peer-reviewed publications** (Selected from 82 peer-reviewed publications)

#### **Five relevant and recent manuscripts:**

1. \*\*Schellenbacher C, Kwak K, Fink D, Shafti-Keramat S, Huber B, Jindra C, Faust H, Dillner J, Roden RB, **Kirnbauer R**. Efficacy of RG1-VLP Vaccination against Infections with Genital and Cutaneous Human Papillomaviruses. *J Invest Dermatol*, 2013 May 10. doi: 10.1038/jid.2013.253. [NIHMS514042](#)
2. \*\*Schellenbacher C, Roden RB, **Kirnbauer R**. Chimeric L1-L2 Virus-like Particles As Potential Broad-Spectrum Human Papillomavirus Vaccines. *J Virol* 83(819):10085-95(2009) PMC2748020
3. Slupetzky K, Gambhira R, Culp TD, Shafti-Keramat S, Schellenbacher C, Christensen ND, Roden RB, **Kirnbauer R**. A papillomavirus-like particle (VLP) vaccine displaying HPV16 L2 epitopes induces cross-neutralizing antibodies to HPV11. *Vaccine* 25:2001-2010(2007) PMID: 17239496
4. Handisurya A, Gilch S, Winter D, Shafti-Keramat S, Maurer D, Schätzl HM, **Kirnbauer R**. Vaccination with prion peptide-displaying papillomavirus-like particles induces auto-antibodies to normal prion protein that interfere with pathological prion production in infected cells. *FEBS Journal* 274:1747-1758(2007) PMID: 17313482
5. Zamora E, Handisurya A, Shafti-Keramat S, Borchelt D, Rudow G, Conant K, Cox C, Troncoso JC, **Kirnbauer R**. Papillomavirus-like particles are an effective platform for amyloid-beta immunization in rabbits and transgenic mice. *J Immunol* 177:2662-2670(2006) PMID: 16888028

#### **Ten relevant manuscripts demonstrating contribution to field of HPV biology and vaccines:**

6. **Kirnbauer R**, Booy F, Cheng N, Lowy DR, Schiller JT. Papillomavirus L1 major capsid proteins self-assemble into virus-like particles that are highly immunogenic. *Proc. Natl. Acad. Sci. USA* 89: 12180-12184 (1992) PMC50722
7. **Kirnbauer R**, Taub J, Greenstone H, Roden R, Durst M, Gissmann L, Lowy DR, Schiller JT. Efficient self-assembly of human papillomavirus type 16 L1 and L1-L2 into virus-like particles. *J Virol*. 1993;67(12):6929-36. PMC238150.
8. **Kirnbauer R**, Hubbert NL, Wheeler CM, Becker TM, Lowy DR, Schiller JT. A virus-like particle ELISA detects serum antibodies in a majority of women infected with human papillomavirus type 16. *J. Natl. Cancer Inst.* 86(7): 494-499(1994) PMID: 8133532
9. Christensen ND, **Kirnbauer R**, Schiller JT, Ghim S-J, Schlegel R, Jenson BA, Kreider JW. Human papillomavirus types 6 and 11 have antigenically distinct strongly-immunogenic conformationally-dependent neutralizing epitopes. *Virology* 205:329-335 (1995) PMID: 7526536
10. Roden RB, Greenstone HL, **Kirnbauer R**, Booy FP, Jessie J, Lowy DR, Schiller JT. In vitro generation and type-specific neutralization of a human papillomavirus type 16 virion pseudotype. *J Virol*. 1996;70(9):5875-83. PMC190605.

Program Director/Principal Investigator (Last, First, Middle): KIRNBAUER, R

11. **Kirnbauer R**, Chandrachud LM, O'Neil BW, Wagner ER, Grindlay GJ, Armstrong A, McGarvie GM, Schiller JT, Lowy DR and Campo MS: Virus-like Particles of Bovine Papillomavirus Type 4 in Prophylactic and Therapeutic Immunization. *Virology* 219(1):37-44(1996) PMID: 8623552
12. Huber B, Schellenbacher C, Shafti-Keramat S, Jindra C, Christensen N, **Kirnbauer R**. Chimeric L2-Based Virus-Like Particle (VLP) Vaccines Targeting Cutaneous Human Papillomaviruses (HPV). *PLoS One*. 2017 Jan 5;12(1):e0169533. doi: 10.1371/journal.pone.0169533.
13. Roden R, Armstrong A, Haderer P, Christensen N, Lowy D, Schiller J, **Kirnbauer R**. Characterization of a human papillomavirus type 16 variant-dependent neutralizing epitope. *J. Virol.*71(8):6247-52 (1997) PMC191893
14. Wideroff L, Schiffman MH, Haderer P, Armstrong A, Greer CE, Manos MM, Burk RD, Scott DR, Sherman ME, Schiller J, Hoover R, Tarone RE, **Kirnbauer R**. Seroreactivity to HPV16, 18, 31, and 45 virus-like particles in a case-control study of cervical squamous intraepithelial lesions. *J Infect Dis* 180:1424-1428(1999) PMID: 10515799
15. Shafti-Keramat S, Handisurya A, Kriehuber E, Meneguzzi G, Slupetzky K, **Kirnbauer R**. Different heparan sulfate proteoglycans serve as cellular receptors for human papillomaviruses. *J Virol* 77(24):13125-13135(2003)PMC296080
16. Hainisch E, Brandt S, Shafti-Keramat S, van den Hoven R, **Kirnbauer R**. Safety and immunogenicity of BPV-1 L1 virus-like particles in a dose-escalation vaccination trial in horses. *Equine Vet J* 2012 Jan;44(1):107-11. PMID: 21895749

#### D. Research Support.

##### 5 Last and Ongoing Research Support

EU-Infect ERA	Kirnbauer (PI)	1.6.2016 - 31.7.2020
HUMAN PAPILOMAVIRUS INFECTION: FROM MOLECULES TO TISSUES TO PREVENTION		
The host-pathogen interaction in regards to clinically relevant strains and the assessment of factors influencing this interplay		
PREVENT (NCI/NIH)	Kirnbauer (co-PI)	2016 - 2022
cGMP production of an RG1-VLP HPV Vaccine and first-in-human phase I trial		
Vienna Science and Technology Fund (WWTF)	Kirnbauer (PI)	1.1.2012 - 31.12.2016
A second generation human papillomavirus (HPV) vaccine with broad-spectrum efficacy against HPV types causing skin and mucosal neoplasia		
The major goal is to evaluate RG1-VLP as a prophylaxis against a broad spectrum of HPV types		
Austrian Science Foundation (FWF TRP 207 B13)	Brandt (PI), Kirnbauer Co-Inv	1.6.2011 - 31.5.2014
Protective potential of BPV1 L1 VLPs in horses		
The major goal is to evaluate BPV1 L1 VLPs as a prophylaxis against BPV1 and BPV2 induced tumors in horses		
Austrian National Bank Nr. 13659	Kirnbauer (PI)	1.1.2010- 30.07.2012
Effects of TNF $\alpha$ -blocking therapy on HPV infection		
The major goal is to evaluate the prevalence of HPV infections in patients on TNF $\alpha$ -blocking biological therapy		