

## Martin Löchelt

Study of biology at the University of Hannover, diploma and PhD studies at the Inst. of Virology, Hannover Veterinary School. Since 1989 at the DKFZ, currently group leader in the Program Infection and Cancer, Division of Genome Modifications and Carcinogenesis.

### Current Research

Research in the lab is mainly related to Foamy Viruses (FVs), a distinct and unique group of Retroviruses. Our emphasis is to construct and functional characterize gene and vaccine antigen expression vectors for therapeutic and prophylactic use in men and animals. For this purpose, different sets of replication-competent and attenuated or replication-deficient FV vectors have been established. For further optimization of FV vectors and as a means to improve their biological safety, the molecular biology and replication mechanisms are additional important topics of ongoing studies. For instance, the inter-species transmission of animal FVs to man as well as host cell-encoded restriction mechanisms that limit both, virus/vector replication as well as zoonotic transmission, are currently studied. Other important issues are related to the assembly of structural components and the definition of cis- and trans-acting components involved.

A project recently initiated in the lab is related to the interplay between tumor cell metabolism and the malignant phenotype of the cells. In particular, the control of aerobic glycolysis, a common feature of tumors known for decades as Warburg effect is studied. Using cell culture and animal models we analyze the consequences of the tumor-specific over-expression of the TKTL1 transketolase isoform. We will define whether over-expression of TKTL1 is not only a marker for malignancy but also a therapeutic target.

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### Future Projects and Goals

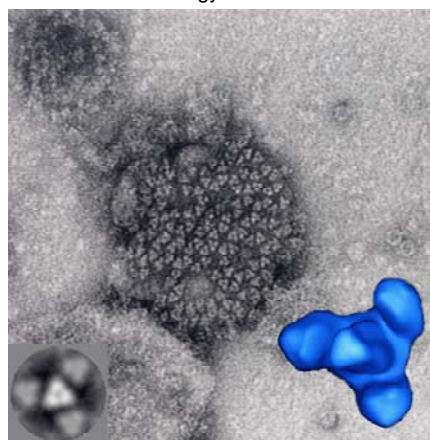
Our goal is to establish and apply efficient and safe FV-based vectors for gene therapy and vaccination by the following projects

1. Replication-competent vaccine vectors
2. Virus-like particles for vaccination
3. Replication-deficient gene vectors
4. Cellular restriction and viral defense
5. Inter-species (zoonotic) transmission of animal foamy viruses

Altered glucose metabolism and cancer: functional consequences of transketolase dys-regulation

### Selected Publications

- Löchelt et al., 1993. PNAS 90:7317  
Wilk et al. 2000. J.Virol. 74:2885  
Wagner et al. 2000. J.Virol. 74:4441  
Wilk et al. 2001. J.Virol. 75:7995  
Schwantes et al. 2003. J.Virol. 77:7830  
Löchelt 2003. CTMI 277:27  
Bastone et al. 2003. J.Vet.Med.B 50:417  
Bastone & Löchelt 2004. Gene Ther. 11:465  
Geiselhart et al. 2004. J.Virol. 78:13573  
Löchelt et al. 2005. PNAS 102:7982  
Bastone et al. 2007. Gene Ther. 14:613  
Romen et al. 2007. Virology 364:123



Trimers of the Foamy Virus Env surface glycoprotein are arranged in hexameric rings on released particles as seen in negative-stain EM images (courtesy of Thomas Wilk).