

# Curriculum vitae Martin F. Bachmann

## Personal data

Date of birth: 15. December 1967  
Birthplace: Winterthur, Switzerland  
Citizen of Winterthur  
Marital status: Married, two children

## Education

1974 - 1980 Primary school in Hettlingen, Switzerland  
1980 - 1986 Gymnasium in the Kantonschule Rychenberg, Winterthur, Switzerland  
1986 Eidgenössische Matura Typus B (final examination)  
1986 - 1991 Study of Cell Biology at the Eidgenössischen Technischen Hochschule Zürich (ETH). Diploma thesis at the Institute for Neurobiology in the laboratory of Prof. Dr. M. Schachner on the influence of cell adhesion molecules on the adhesiveness of the extracellular matrix.  
The thesis was honoured with the ETH silver medal.  
1991 Completion of studies (Dipl. Natw. ETH). Final examinations were passed with distinction since maximal marks were achieved in all examinations.  
1991 - 1995 PhD thesis in the Institute for Experimental Immunology in the lab of Prof. Zinkernagel and Prof. Hengartner under the supervision of Prof. Zinkernagel (ETH Zürich/Universitätsspital Zürich). The thesis was honoured with the ETH silver medal.

## Professional Experience

1995 Post-Doc in the lab of Prof. Zinkernagel, Universitätsspital Zürich, Switzerland  
1995 - 1997 Post-Doc in the lab of Prof. Ohashi, OCI, Toronto, Canada  
1997 - 2000 Member at the Basel Institute for Immunology, Basel, Switzerland  
2000 - 2012 Chief Scientific Officer, Cytos Biotechnology AG, Zürich-Schlieren, Buildup of research group of 40-50 people at Cytos  
2003 - 2010 Board of directors, Mavena AG, Switzerland  
2006 - present Scientific Advisory Board of Biotechnology Institute Thurgau, Switzerland  
2012 - present Scientific Advisory Board of a number of companies  
2012 - present Founding of Saiba GmbH and Areba AG and Hypopet AG ongoing, Switzerland  
2012 - present Visiting professor at University of Zürich, Switzerland  
2013 - present Professor of Immunology (associate), University of Oxford, UK  
2014 Founding of Evax AG, Switzerland  
2014 - present Professor of Immunology (full), University of Bern, Switzerland  
2017 - 2019 Visiting Professor, Anhui Agricultural University, China  
2018 Founding of DeepVax GmbH, Switzerland  
2019 – present Director of International Center of Immunology, Anhui Agricultural University, Hefei, China  
2021 Honorary PhD, University of Latvia, Latvia

## Prizes and honours

- ETH Silver Medal for diploma thesis (1991)
- Honoured final examinations (maximal marks in all examinations) (1991)
- ETH Silver Medal for PhD thesis (1995)
- Pfizer Prize 1998 for Immunology
- Swiss Technology Award 2004 (Cytos)
- Swiss Technology Award 2013 (Hypopet i.G.)
- Honorary PhD, University of Latvia, Latvia

## Drug candidates reaching clinical proof-of-concept in humans

- CYT-001: Proof-of-Concept for immunogenicity; Phase I completed
- CYT-002: Immunodrug for treatment of smoking addiction; Phase I completed, Phase II reaches proof-of-concept.
- CYT-003: Immunodrug for the treatment of allergies; Phase I completed clinical proof-of-concept for rhinitis has been reached in phase IIa and phase IIb studies
- CYT-003: Immunodrug for the treatment of asthma. Clinical proof-of-concept has been reached in phase IIa study
- CYT-005: Immunodrug against house-dust-mite allergy; Phase I completed, Phase II reaches proof-of-concept.
- CYT-006: Immunodrug against hypertension; preclinical research completed; Proof-of-concept reached in Phase 2a study. Phase IIb study ongoing
- CYT-004: Immunodrug against Melanoma; preclinical research completed; Several phase I/II completed. The drug candidate has been shown to induce good T cell responses
- Immunodrug against Alzheimer's disease (in collaboration with Novartis); preclinical research completed; several Phase II studies are ongoing
- CYT-0013: Immunodrug against type II diabetes.

## Drug candidates reaching clinical proof-of-concept in companion animals

- Vaccine against canine atopic dermatitis
- Vaccine against equine insect bite hypersensitivity targeting inflammation
- Vaccine against equine insect bite hypersensitivity targeting itch
- Vaccine to render cats hypoallergenic
- Immunostimulator to treat melanoma in horses

## Research projects

- Novartis Research Foundation (2012)  
The role of antibody affinity in mediating protection against autoimmune disease: **CHF 60'000**
- Roche EIN (2012) (Bispecific anti-tumour antibodies: combining tumour- specificity with cytokine agonism) **CHF 300'000**
- Oncosuisse (KFS-3111-02-2013) (2013 – 2016) (Bispecific anti-tumour antibodies: combining tumour- specificity with cytokine agonism) **CHF 240'000**
- SNF (31003A\_149925) (2013 - 2016) (Tracking antigen-specific memory B cell responses at the cellular and molecular level) **CHF 484'000**
- CTI for collaboration Saiba GmbH and Dr Thomas Kündig: Entwicklung eines Alzheimer Impfstoffes der nächsten Generation. **CHF 126'000**
- Michael J Fox Foundation (Development of a vaccine against Parkinson's disease) (2013) **\$630'000**

- Malaria Vaccine Initiative (Development of VLP-based vaccines against malaria) (2013) **150'000£** (Co-Investigator, primary Investigator is Dr Sumi Biswas)
- CTI for collaboration Hypopet AG: Co-investigator **total of ca CHF 800'000 (2014 - 2017)**
- Horizon 2020, EVAC consortium **835'160 CHF for our group (2016-2020)**
- Vifor: ca CHF **435'000**
- Novartis Research Foundation: ca CHF **50'000**
- Saiba GmbH: ca CHF **58'000**
- Allergy Therapeutics: ca CHF **160'000**
- Cancer Research: CHF **340'650** (01.03.2018 – 28.02.2021)
- Eurostars Project E!12504 DRIVE: CHF **509'985** (01.10.2018 – 30.06.2022)
- Bridge – SNF (in cooperation with ETH Zürich): CHF **820'041** (1.1.2019 – 31.12.2022)
- SNF: **CHF 846'720** (1.4.2019 – 31.3.2023)
- Eurostars Project E!114258 ASF: **CHF 305'607** (1.10.2020 – 30.9.2023)
- UniBE ID Grant: **CHF 75'000** (1.2.2021 – 31.1.2022)
- Cancer Research: **CHF 371'350.00** (1.10.2021 – 30.9.2024)

### Teaching activities:

- Clinical Vaccine Development & Biomanufacturing (Yearly, University of Oxford)
- Human and Veterinary Vaccinology (Yearly, University of Oxford)
- MIPS Modul 12 (Vaccinology course at ETH)
- Immuno III lecture (Yearly, ETH)
- Basic Immunology Course Bern (Yearly, University of Bern)
- Master course in Molecular and Cellular Immunology (Yearly, University of Bern)

### Memberships in panels, board

2003 - 2010	Board of directors, Mavena AG
2006 -	Scientific Advisory Board of Biotechnology Institute Thurgau
2012 -	Board of directors of a number of companies (Hypopet AG, Evax AG, Saiba AG)

### Focus of Research

My research has been dominated by the question how immune responses are regulated and how innate immune responses influence adaptive immunity. Viruses, virus-like particles and bacteria have been used to probe the protective capacity of the induced immune responses. Key problems that have been addressed are how optimal T and B cell responses are induced and maintained and how they are influenced by toll-like receptor stimulation. Understanding the cellular networks of the immune system is of significant medical interest since i) prophylactic vaccines, which are the most effective medical intervention known to date, are based on the induction of long-lived immune responses and ii) a deregulated immune system is the underlying cause of many chronic diseases and autoimmunity. In the last 10 years, I have taken the basic research performed in mice one step further and several clinical trials have been performed or are now ongoing. Clinical proof of concept has been obtained in 4 different indications (Smoking cessation, allergy, asthma and hypertension). Studies in Alzheimer's disease are in phase III with Novartis and a novel vaccine against influenza virus was successfully tested in Singapore. A novel VLP-based vaccine platform has been established that has reached numerous PoC for treatment of chronic diseases in companion animals.

- A large number of studies have been performed in mice analyzing how stimulation of the innate immune system influences the induction of specific T and B cell responses (137-

- 139, 141, 144, 146, 157, 158, 159, 165, 166, 175, 177). Virus-like particles and viruses were used for all studies.
- Another large number of studies in mice has been performed design vaccines by giving them a viral fingerprint (134, 135, 147, 151, 153, 160, 163, 164, 168, 178).
  - Epitope repetitiveness has been established as a geometric pathogen-associated molecular pattern (PAMP) (review 39, 183). This offers an explanation for the high immunogenicity of viruses.
  - The role of IL-1a, IL-1b, and membrane bound versus soluble TNF has been tested in murine models of tuberculosis and listeria (142, 174).
  - A novel vaccine platform has been developed with proof-of-concept in humans in 5 indications (Smoking cessation, allergy, asthma, and hypertension). Smoking cessation has been partnered with Novartis after phase II (136, 148, 150, 161, 167, 169, 188).
  - Partnership with Pfizer Animal Health on two vaccines developed by Cytos.
  - Partnership with Pfizer on 2 human vaccines.
  - Partnership with Lonza on expression system
  - Preclinical proof-of-concept has been obtained for vaccines against flu, pandemic flu, West-Nile Virus and Dengue Virus. Development of the flu vaccine is currently performed with A\*Star in Singapore and clinical studies should be initiated Q2 2012 (170, 171, 184).
  - Partnerships with the NIH as well as the US army for the development of a vaccine against malaria are ongoing.
  - A virus-based functional genomics technology has been established allowing to perform global screens for proteins with pre-determined biological activity. This allowed the cloning of several important molecules (93, 109, 115, 127, 133).
  - The functional genomics technology has been modified to allow cloning of fully human mAbs (149, 156, 176, 181). The latter technology has been sold to Intercell (CHF 22 Mio).
  - Development of a novel cancer vaccine platform (169 and 182).

## **Publications**

> 300 publications, h-index 103, 41'181 citations