CURRICULUM VITAE

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PUBLICATION STATISTICS

2nd March 2023: H-Index: **54**; Total number citations: 10761

UNIVERSITY EDUCATION

1976 - 1982 Student of Chemistry at Hamburg University
Diplom thesis: "Synthesis and properties of covalently linked Viologene - Metallocenes of iron and ruthenium as possible photochemical systems in solar energy conversion".

1983 - 1987	Ph.D. thesis at the GBF (Gesellschaft für Biotechnologische Forschung) Braunschweig: "Influence of the primary and secondary structures of a gene start on translation initiation in E. coli"

PROFESSIONAL EDUCATION

1987 - 1988	Post doctoral fellow, DNA synthesis group (Dr. Helmut Blöcker, Dr. Ronald Frank) and Department of Genetics (Prof. Dr. John Collins), GBF, Mascheroderweg 1, 38124 Braunschweig, Germany
1988 - 1990	Post doctoral fellow, Laboratoire de Biologie et Immunologie Molécularies des Rétrovirus (Dr. Simon Wain-Hobson), Institut Pasteur, 28 rue du Docteur Roux, F-75724 Paris Cédex 14, France
1991-1998	Assistant Professor, Department of Virology, University Freiburg, Hermann Herder Str. 11, 79104 Freiburg, Germany
1998-2009	Full Professor (C3), Department of Virology, University of the Saarland, Building 47, 66241 Homburg, Germany
since 2010	ICREA Research Professor at the University Pompeu Fabra, Infection Biology Group, Department of Experimental and Health Sciences, Doctor Aiguader 88, Edificio PRBB 3er piso, 08003 Barcelona, Spain

Short term research fellowships

July *1988*	Laboratory of Dr. John Sninski, Cetus Corporation, Emeryville, USA
Nov. and Dec. *1990*	Laboratory of Dr. Birgitta Asjö, Department of Virology, Karolinska Institute, Stockholm, Sweden
Aug. to Oct. *1992*	Laboratory of Dr. Toshitada Takemori, Department of Immunology, NIH, Tokyo, Japan
June to September *2017*	Visiting Professor at Department of Chemical and Systems Biology (Laboratory of James Ferrell), Stanford University, USA

SCIENTIFIC PRIZE

1995	"Langener Wissenschaftspreis" for excellent scientific work in the field of viral pathogenesis

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TEACHING EXPERIENCE

1986	Instructor on DNA synthesis, ligation and sequencing of DNA fragments during the EMBO Course on "Secretion in non-E. coli systems" organized by John Collins in Braunschweig, Germany
1987	Instructor on Cassette Mutagenesis during the EMBO Course on "Directed mutagenesis and protein engineering" organized by Hans Joachim Fritz in Martinsried, Germany
1989, 1990	Instructor on Application of PCR: cloning and sequencing during a practical course "Cours de Génie Génétique" at the Institut Pasteur in Paris, France
1991	Instructor on Medical Microbiology during the practical course "Praktikum der Mikrobiologie für Mediziner" at the University in Freiburg, Germany
1992 to 1994	Instructor on Medical Microbiology during the practical course "Praktikum der Mikrobiologie für Zahnmediziner" at the University in Freiburg, Germany
1992 to 1998	Lecturer in Retrovirology during a theoretical course on "Molekulare Virologie" at the University of Freiburg, Germany
1991 to 1998	Lecturer of a seminar on "Neue Ergebnisse der AIDS-Forschung" at the University of Freiburg, Germany
1998 to 2009	Lecturer of a seminar on "Molekularbiologie und Immunologie der HIV-Infektion" at the University of the Saarland, Germany
	Lecturer of a main course on "Mikrobiologie und Immunologie" at the University of the Saarland, Germany

	Lecturer of a main course on "Virologie und Immunologie" at the University of the Saarland, Germany
	Lecturer of an intensive 2-week course on "Infektionsbiologie" at the University of the Saarland, Germany
Since 2011	Advanced Virology course for 3rd year students (4 credits including lectures, seminars and practicals) at the Universitat Pompeu Fabra, Barcelona, Spain
2012	One-week Lecture course on Virology and Immunology at the Center for Research in Scientific Computation, N.C. State University, Raleigh, USA
2012	Undergraduate Training for Research: one-week practicum/seminar course for undergraduate US students (North Carolina, USA) of Mathematics and Biology at the Universitat Pompeu Fabra, Barcelona, Spain

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MANAGEMENT TASKS AND ACTIVITIES

since 2010	Class III Biological Safety Containment Laboratory Biosecurity Supervisor for the P3 laboratory of the Universitat Pompeu Fabra, Barcelona, Spain
2010	Guest editor for a special edition on World-wide challenges and perspectives for handling HIV/Mycobacterium tuberculosis co-infections of the "The Open Infectious Diseases Journal"
since 2011	UPF representative in the Biosecurity committee of the Biomedical Research Park (PRBB), Barcelona, Spain
2012	Guest editor for a special edition on Distributed Parameter Systems in Immunology of the journal "Mathematical Modeling of Natural Phenomena: Vol. 7, No. 5, (2012)"
2019/20	Topic editor on “Mathematical Modeling of the Immune System in Homeostasis, Infection and Disease” for Frontiers in Immunology.
2022	Co-organizer of the International Conference

"Mathematics Applied to Immunology and Virology" to be held at the Sirius Mathematics Centre (https://sochisirius.ru/smc), Sochi (Russia), November, 2022

RESEARCH INTERESTS

Infections with non-cytopathic viruses usually have 2 different outcomes. They may be eliminated by host immune responses (acute infections) or they may persist lifelong (persistent infections). Medically important examples are the Hepatitis B virus (HBV), the Human Immunodeficiency virus (HIV) and the Hepatitis C virus (HCV) that in adults usually follow an acute (HBV), a persistent (HIV) or an either acute or persistent (HCV) infection course. My laboratory is interested (i) to understand the factors that regulate the decision between an acute versus a persistent infection course, (ii) to define the factors that control the dynamic balance of virus expansion and immune control in persistent infections, (iii) to design immunogens to inhibit virus infections, and (iv) to generate quantitative descriptions of the virus/immune system dynamics by mathematical modeling.

PRESENT RESEARCH GRANTS

Development of a vaccine against SARS-CoV2. Departament de Salut - Generalitat de Catalunya. Funding period: 01.06.2020 – 31.12.2020; 87.000€. PI: Felipe Garcia, IDIBAPS; Role of Andreas Meyerhans: consortium partner for UPF; task: Immunogen design.

Immunological analysis of cancer patients receiving a specific cancer vaccine. Consultancy service contract between UPF and Pangaea Oncology SA.
Funding period: 01.09.2020 – 31.08.2024; 31.100€.
PI: Andreas Meyerhans

Immune cell coordination and cooperativity during acute and chronic virus infections (ImmunCoop). Spanish Ministry of Science and Innovation grant no. PID2022-141395OB-I00.
Funding period: 01.09.2023 – 31.08.2025; 171.000€.
PI: Andreas Meyerhans

Characterization and manipulation of control points of virus infection fates (ConVir). Spanish Ministry of Science and Innovation grant no. PID2019-

106323RB-I00 AEI//10.13039/501100011033. Funding period: 01.06.2020 – 31.05.2023; 193.600€.
PI: Andreas Meyerhans

Towards a universal therapeutic vaccine against chronic virus infections (HR17-00199). "la Caixa" Banking Foundation call Health Research 2017. Funding period: 01.01.2019 – 15.06.2023; 484.316€.
PI: Andreas Meyerhans; Co-PI: Christian Brander

Project of the Russian Science Foundation no. 18-11-00171. "Mathematical and computational methods of multiscale and hybrid modelling of immune processes"
PIs: Gennady Bocharov, Meyerhans Andreas, Volpert Vitaly, Nickolay Bessonov
Funding: 6 000 000 Rubles per year (around 81 000€/year)
Duration: 2018-2022

El Grupo Español Multidisciplinar de Melanoma (**GEM**) para Grupos Emergentes al proyecto "Immune response to SARS-CoV-2 vaccination in melanoma patients treated with anti-PD-1/PD-L1 antibodies".
20.000€; May 2021 – June 2022.
PI: Andreas Meyerhans

Research collaborations with industry

Immunological analysis of cancer patients receiving a specific cancer vaccine. Consultancy service contract between **UPF and Pangaea Oncology SA.**
Funding period: 01.09.2020 – 31.08.2024; 31.100€.
PI: Andreas Meyerhans

HeiQ-UPF 2021 (September –December 2021): "Virus inhibition by Nano-Ag in vitro".
Payment by HeiQ: 8000€
PI: Andreas Meyerhans

HIPRA SCIENTIFIC, S.L.U. - UPF 2021:
Study of the cellular immune response developed by mice vaccinated with a Covid-19 vaccine candidate from Hipra Scientific SLU.
18,700€ 2 months; June + July 2021
PI: Andreas Meyerhans

HIPRA SCIENTIFIC, S.L.U. - UPF 2021:

Study of the cellular immune response developed by pigs vaccinated with a Covid-19 vaccine candidate from Hipra Scientific SLU.
18,700€ 2 months; October – November 2021.
PI: Andreas Meyerhans

PATENTS

H. Blöcker, R. Frank, G. Heisterberg-Moutsis, G. Kurth and **A. Meyerhans**. Method to purify synthetic oligonucleotides (Verfahren zur Aufreinigung synthetischer Oligonucleotide). P 34 33 649.4; EP 85110454.7, US Patent 4 997 927, Kanadisches Patent 1 288 363 (1989)

J. Collins, R. Frank, F. Maywald, H. Blöcker, F. Götz, R. Netzker, K. Schwellnus and **A. Meyerhans**. Medical compound containing cardiodilatin produced by fermentation and the method of production (Arzneimittel enthaltend fermentationstechnisch hergestelltes Cardiodilatin und Verfahren zur Herstellung desselben). Deutsche Patentanmeldung P 3535797.5 (1985)

D. Paulsen, H. Rübsamen-Waigmann, Kureishi, G. Hunsmann, C. Stahl-Henning, **A. Meyerhans**, A. Schütz. PPVO als Kombipartner zur HAART ("Parapoxviruses in combination with other antiviral agents for the treatment of viral diseases"). European patent application BHC 04 1 071 (2004). The patent is now issued under number 4897677 in **Japan** (date: 06/01/2012), under number 249906 in **India** (date: 22/11/2011), under number 8,343,478 in **USA** (date: 01/01/2013).

International PCT-patent application:
Andreas Meyerhans, Juana Diez, George Koutsoudakis, Javier Martinez, Mark Brönstrup, Rolf Müller, Jochen Hühn, Heinrich Steinmetz, Matthias Keck, Daniel Krug, Kirsten Harmrolfs, Tim Sparwasser, Matthias Lochner, Amrita Nandan. Applicants: Helmholtz-Zentrum für Infektionsforschung (Braunschweig, Germany) and Twincore (Hannover, Germany).
Titel: Neosoraphens; PCT/EP2015/000757; filed on 10/04/2015 at the European Patent Office.

Maurizio Botta, Annalaura Brasi, Roberta Fazi, Cristina Tintori, Jose Este Araque, Miguel Angel Martinez de la Sierra, Javier Martinez, **Andreas Meyerhans**.
Titel: Human helicase DDX3 inhibitors as therapeutic agents; EP15167177.3; filed on 11/05/2015; **2021**: **US Patent** 10,941,121.

BOOKS

Gennady Bocharov, Vitaly Volpert, Burkhard Ludewig, **Andreas Meyerhans**. Mathematical Immunology of Virus Infections. Springer/Nature, **2018 (Springer/Nature ISBN 978-3-319-72316-7)**.

PUBLICATIONS

Productivity indicators

- Google Scholar (2nd March 2023)
  - Sum of the Times Cited: 10761
  - h-index: 54

(1) **A Meyerhans**, W. Pfau, R. Memming and P. Margaretha. Synthesis of covalently linked Viologen Metallocenes. **Helv. Chim. Acta** 65, 2603 (1982)

(2) R. Frank, **A. Meyerhans**, K. Schwellnus and H. Blöcker. Simultaneous synthesis and biological applications of DNA-fragments: an efficient and complete methodology. **Methods of Enzymology** 154, 221-249 (1987)

(3) F. Maywald, T. Böldicke, G. Gross, R. Frank, H. Blöcker, **A. Meyerhans**, K. Schwellnus, J. Ebbers, W. Bruns, G. Reinhard, E. Schnabel, W. Schröder, H. Fritz and J. Collins. Human pancreatic secretory trypsin inhibitor (PSTI) produced in active form and secreted from Escherichia coli. **Gene** 68, 357-369 (1988)

(4) **A. Meyerhans**, R. Cheynier, J. Albert, M. Seth, S. Kwok, J. Sninsky, L. Morfeldt-Manson, B. Åsjö and S. Wain-Hobson. Temporal fluctuations in HIV quasispecies in vivo are not reflected by sequential HIV isolations. **Cell** 58, 901-910 (1989)

(5) T. Huet, R. Cheynier, **A. Meyerhans**, G. Roelants and S. Wain-Hobson. Genetic organization of a chimpanzee lentivirus related to HIV-1. **Nature** 345, 356-359 (1990)

(6) **A. Meyerhans**, JP. Vartanian and S. Wain-Hobson. DNA recombination during PCR. **Nucl. Acids Res.** 18, 1687-1691 (1990)

(7) JP. Vartanian, **A. Meyerhans**, B. Asjö and S. Wain-Hobson. Selection, recombination and G-A hypermutation of HIV-1 genomes. **J. Virol.** 65, 1779-1788 (1991)

(8) L. Pedroza-Martins, N. Chenciner, B. Asjö, **A. Meyerhans** and S. Wain-Hobson. Independent fluctuation of human immunodeficiency virus type 1 rev and gp41 quasispecies in vivo. **J. Virol.** 65, 4502-4507 (1991).

(9) **A. Meyerhans**, G. Dadaglio, JP. Vartanian, P. Langlade-Demoyen, R. Frank,

B. Asjö, F. Plata and S. Wain-Hobson. In vivo persistence of a HIV-1-encoded HLA-B27-restricted cytotoxic T lymphocyte epitope despite specific in vitro reactivity. **Eur. J. Immunol.** 21, 2637-2640 (1991).

(10) G. Morelle, R. Frank and **A. Meyerhans**. Restructuring the translation initiation region of the human parathyroid hormone gene for improved expression in Escherichia coli. **Biochimica et Biophysica Acta** 1089, 320-324 (1991)

(11) **A. Meyerhans**, JP. Vartanian and S. Wain-Hobson. Strand specific PCR amplification of low copy number DNA. **Nucl. Acids Res.** 20, 521-523 (1992).

(12) J.P. Vartanian, **A. Meyerhans**, M. Henry, and S. Wain Hobson. High-resolution structure of a HIV-1 quasispecies: identification of novel coding sequences. **AIDS** 6, 1095-1098 (1992).

(13) S. Delassus, **A. Meyerhans**, R. Cheynier and S. Wain-Hobson. Absence of selection of HIV-1 variants in vivo based on transcription/ transactivation during progression to AIDS. **Virology** 188, 811-818 (1992)

(14) U. Hobohm and **A. Meyerhans**. A pattern search method for putative anchor residues in T cell epitopes. **Eur. J. Immunol.** 23,.1271-1276 (1993).

(15) **A. Meyerhans**, JP. Vartanian, C. Hultgren, U. Plikat, A. Karlsson, LY. Wang, S. Eriksson and S. Wain-Hobson. Enhancement and restriction of HIV replication by modulation of the intracellular dNTP pool. **J. Virol.** 68, 535-540 (1994).

(16) J.P. Vartanian, **A. Meyerhans**, M. Sala and S. Wain-Hobson. G-A hypermutation of the HIV-1 genome: evidence for dCTP pool imbalance during reverse transcription. **Proc.Natl.Acad.Sci.** 91, 3092-3096 (1994)

(17) R. Maier, K. Falk, O. Rötzschke, B. Maier, V. Gnau, S. Stefanovic, G. Jung, H.G. Rammensee and **A. Meyerhans**. Peptide motifs of HLA-A3, -A24, and -B7 molecules as determined by pool sequencing. **Immunogenetics** 40, 306-308 (1994).

(18) M. Lucchiari, G. Niedermann, C. Leipner, **A. Meyerhans**, K. Eichmann and B. Maier. Human immune response to HIV-1-nef. I. $CD45RO^-$ T lymphocytes of non-infected blood donors contain CTL-precursors at high frequency. International **Immunology** 6, 1739-1749 (1994).

(19) Nietfeld, W., Bauer, M., Fevrier, M., Maier, R., Holzwarth, B., Frank, R., Maier, B., Riviere, Y., and **Meyerhans, A.**. Sequence constraints and recognition by cytotoxic T lymphocytes of an HLA-B27 restricted HIV-1 gag epitope. **J. Immunol.** 154, 2188-2197 (1995).

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Häusser, C. Hultgren, **A. Meyerhans**, and T. Takemori. Monocyte-derived cultured dendritic cells are susceptible to HIV infection and transmit virus to resting T cells in the process of nominal antigen presentation. **J. Virol.** 69, 4544-4547 (1995).

(21) J.-A. Rump, J. Schneider, H.-H. Peter, O. Haller, and **A. Meyerhans**. Long term survivors with continuously high levels of HIV type 1. **AIDS Research and Human Retroviruses** 12, 757-758 (1996).

(22) W. Nietfeld and **A. Meyerhans**. Cloning and sequencing of hIk-1, a cDNA encoding a human homologue of mouse Ikaros/LyF-1. **Immunol.Lett.** 49, 139-141 (1996).

(23) M. Lucchiari-Hartz, M. Bauer, G. Niedermann, B. Maier, **A. Meyerhans**, and K. Eichmann. Human immune response to HIV-1 Nef. II. Induction of HIV-1/HIV-2-Nef crossreactive CTL in peripheral blood lymphocytes of non-infected healthy individuals. **International Immunology** 8, 577-584 (1996).

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(25) M. Bauer, M. Lucchiari-Hartz, R. Maier, G. Haas, B. Autran, K. Eichmann, R. Frank, B. Maier, and **A. Meyerhans**. Structural constraints of HIV-1 Nef may curtail escape from HLA-B7-restricted CTL recognition. **Immunol.Lett.** 55, 119-122 (1997).

(26) R. Cheynier, S. Gratton, J.P. Vartanian, **A. Meyerhans**, and S. Wain-Hobson. G-A hypermutation does not result from PCR. **AIDS Research and Human Retroviruses** 13, 985-986 (1997).

(27) J.P. Vartanian, U. Plikat, M. Henry, L. Guillemot, **A. Meyerhans**, and S. Wain-Hobson. HIV genetic variation is directed and restricted by DNA precursor availability. **J.Mol.Biol.** 270, 139-151 (1997).

(28) U. Plikat, K. Nieselt-Struwe and **A. Meyerhans**. Genetic drift can dominate short-term HIV-1 nef quasispecies evolution in vivo. **J. Virol.** 71, 4233-4240 (1997).

(29) U. Dittmer, T. Nißlein, D. Fuchs, **A. Meyerhans**, G. Hunsmann, and C. Stahl-Henning. No reactivation of attenuated immunodeficiency viruses in rhesus macaques after vaccinia virus-induced immune activation. **J.Gen.Virol.** 78, 2523-2528 (1997).

(30) S. Günther, G. Sommer, U. Plikat, A. Iwanska,S. Wain-Hobson, H. Will, and **A. Meyerhans.** Naturally occurring hepatitis B virus genomes bearing the hallmarks of retroviral G-A hypermutation. **Virology** 235, 104-108 (1997).

(31) G. Häusser, B. Ludewig, H. Gelderblom, Y. Tsunetsugu-Yokota, K. Akagawa, **A. Meyerhans**. Monocyte-derived dendritic cells represent a transient stage of differentiation in the myeloid lineage. **Immunobiology** 197, 534-542 (1997).

(32) M. Bauer, M. Lucchiari-Hartz, H. Fickenscher, K. Eichmann, J. McKeating, and **A. Meyerhans**. Herpesvirus saimiri-transformed human $CD4^+$ T cell lines: an efficient target cell system for the analysis of Human Immunodeficiency Virus-specific cytotoxic CD8+ T-Lymphocyte activity. **J.Virol.** 72, 1627-1631 (1998).

(33) K. Verhoef, M. Bauer, **A. Meyerhans**, and B. Berkhout. On the role of the second coding exon of the HIV-1 Tat protein in virus replication and MHC class I downregulation. **AIDS Research and Human Retroviruses** 14, 1553-1559 (1998).

(34) S. M. Weiner, J.-A. Rump, W. Kreisel, R. Thimme, H. E. Blum, **A. Meyerhans**, and J. Schneider. Granulocyte colony-stimulating factor (G-CSF) may stimulate HIV-replication during cytostatic chemotherapy. **Eur.J.Haematol.** 61, 354-355 (1998).

(35) F. Eckhardt and **A. Meyerhans**. Cloning and expression pattern of a murine semaphorin homologous to H-sema IV. **Neuroreport** 9, 3975-3979 (1998).

(36) V. Falcone, M. Schweizer, A. Toniolo, D. Neumann-Haefelin, and **A. Meyerhans**. Interferon-γ is a major suppressive factor produced by activated human peripheral blood lymphocytes that is able to inhibit foamy virus induced cytopathic effects. **J. Virol.** 73, 1724-1728 (1999).

(37) J.-P. Vartanian, M. Sala, M. Henry, S. Wain-Hobson, and **A. Meyerhans**. Manganese cations increase the mutation rate of human immunodeficiency virus type 1 ex vivo. **J.Gen.Virol.** 80, 1983-1986 (1999).

(38) M. Lucchiari-Hartz, P. M. van Endert, G. Lauvau, R. Maier, **A. Meyerhans**, D. Mann, K. Eichmann, and G. Niedermann. CTL epitopes of HIV 1-Nef: Generation of multiple definitive MHC class I ligands by proteasomes. **J.exp.Med.** 191, 239-252 (2000).

(39) R. Maier, M.-M. Bartolomé-Rodríguez, C. Moulon, H.-U. Weltzien and **A. Meyerhans**. Kinetics of CXCR4 and CCR5 upregulation and HIV expansion following antigenic stimulation of primary CD4+ T lymphocytes. **Blood** 96, 1853-1856 (2000).

(40) M. Sester, U. Sester, H. Köhler, T. Schneider, L. Deml, R. Wagner, N. Müller-Lantzsch, H. Pees, and **A. Meyerhans**. Rapid whole blood analysis of virus-specific CD4+ and CD8+ T-cell responses in persistent HIV infection.

AIDS 14, 2653-2660 (2000).

(41) W. Schmidt, U. Wahnschaffe, M. Schäfer, T. Zippel, M. Arvand, **A. Meyerhans**, E.-O. Riecken, and R. Ullrich. Rapid increase of mucosal CD4 T cells followed by clearance of intestinal cryptosporidiosis in an AIDS patient receiving highly active antiretroviral therapy. **Gastroenterology** 120, 984-987 (2001).

(42) M. Sester, U. Sester, B. Gärtner, G. Heine, M. Girndt, N. Mueller-Lantzsch, **A. Meyerhans**, and H. Köhler. Levels of virus-specific CD4 T-cells correlate with cytomegalovirus control and predict virus-induced disease following renal transplantation. **Transplantation** 71, 1287-1294 (2001).

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(44) L. Kils-Huetten, R. Cheynier, S. Wain-Hobson, and **A. Meyerhans**. Phylogenetic reconstruction of intrapatient evolution of HIV-1: predominance of drift and purifying selection. **J. Gen. Virol.** 82, 1621-1627 (2001).

(45) M. Sester, U. Sester, B. Gärtner, B. Kubuschok, M. Girndt, **A. Meyerhans**, and H. Köhler. Sustained high frequencies of specific CD4 T cells restricted to a single persistent virus. **J. Virol.** 76, 3748-3755 (2002).

(46) T. Heintel, M. Sester, MM. Bartolomé Rodríguez, C. Krieg, U. Sester, R. Wagner, H. Pees, B. Gärtner, R. Maier, and **A. Meyerhans**. The fraction of perforin-expressing HIV-specific CD8 T cells is a marker for disease progression in HIV infection. **AIDS** 16, 1497-1501 (2002).

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(51) T. Heintel, F. Breinig, M. Schmitt, and **A. Meyerhans**. Extensive MHC class I-restricted CD8 T lymphocyte responses against various yeast genera in humans. **FEMS Immunology and Medical Microbiology** 39, 279-286 (2003).

(52) C. Krieg, R. Maier and **A. Meyerhans**. Gut homing (α4β7+) Th-1 memory responses after inactivated poliovirus immunisation (IPV) in orally poliovirus pre-immunised donors. **J. Gen. Virol.** 85, 1571-1579 (2004).

(53) S. Aziz, O. T. Fackler, **A. Meyerhans**, N. Müller-Lantzsch, M. Zeitz and T. Schneider. Replication of M-tropic HIV-1 in activated human intestinal lamina propria lymphocytes is the main reason for increased virus load in the intestinal mucosa. **J. Acquir. Immune Defic. Syndr**. 38, 23-30, (2005).

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(56) Tanja Breinig, Martina Sester, Urban Sester, and **Andreas Meyerhans**. Antigen-specific T cell responses: determination of their frequencies, homing properties, and effector functions in human whole blood. **Methods** 38, 77-83 (2006).

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