Curriculum Vitae

Personal information

Othmar Engelhardt

Work experience

1. Employer: Medicines and Healthcare products Regulatory Agency
   - Start date: 062006
   - End date:
   - Position: Head of Seasonal Influenza
   - Activities: Standardisation of influenza vaccines Generation of influenza candidate vaccine viruses Control of influenza vaccines Influenza serology Research
   - Country: United Kingdom
2. Employer: University of Oxford
   - Start date: 112002
   - End date: 062006
   - Position: Postdoctoral Research Assistant
   - Activities: Research (influenza virus)
   - Country: United Kingdom
3. Employer: Universitaet Freiburg
   - Start date: 091998
   - End date: 112002
   - Position: Postdoctoral fellow
   - Activities: Research (interferon_induced antiviral proteins; Thogoto virus)
   - Country: Germany
4. Employer: Mount Sinai School of Medicine, New York
   - Start date: 031994
   - End date: 041998
   - Position: Associate
   - Activities: research (for PhD) (influenza virus reverse genetics)
   - Country: United States

Education and training

1. Subject: University of Natural Resources and Applied Life Sciences, Vienna
   - Start date: 1993
   - End date: 1998
   - Qualification: Doctor rerum naturalium technicarum
   - Organisation: biotechnology virology molecular biology
   - Country: Austria
2. Subject: University of Natural Resources and Applied Life Sciences, Vienna
   - Start date: 1987
   - End date: 1993
   - Qualification: Diplom_Ingenieur
   - Organisation: food technology and biotechnology
   - Country: Austria

Additional information

Publications

Original work, peer_reviewed: 1. O. Engelhardt, R. Grabherr, G. Himmler and F. Rüker. (1994) Two_step cloning of antibody variable domains in a phage display vector. BioTechniques 17: 44, 46. 2. T. Muster, B. Ferko, A. Klima, M. Purtscher, A. Trkola, P. Schulz, A. Grassauer, O. G. Engelhardt, A. García_Sastre, P. Palese and H. Katinger. (1995) Mucosal model of immunization against human immunodeficiency virus type 1 with a chimeric influenza virus. J. Virol. 69: 6678_6686. 3. S. Pleschka, S. R. Jaskunas, O. G. Engelhardt, T. Zürcher, P. Palese and A. García_Sastre. (1996) A plasmid_based reverse genetics system for influenza A virus. J. Virol. 70: 4188_4192. 4. J. Staczek, H. E. Gilleland, Jr., L. B. Gilleland, R. N. Harty, A. García_Sastre, O. G. Engelhardt and P. Palese. (1998) A chimeric influenza virus expressing an epitope of outer membrane protein F of Pseudomonas aeruginosa affords protection against challenge with P. aeruginosa in a murine model of chronic pulmonary infection. Infect. Immun. 66: 3990_3994. 5. E. Fodor, L. Devenish, O. G. Engelhardt, P. Palese, G. G. Brownlee, and A. García_Sastre. (1999) Rescue of influenza A virus from recombinant DNA. J. Virol. 73:9679_82. 6. E. Wagner, O. G. Engelhardt, F. Weber, O. Haller, and G. Kochs. (2000) Formation of virus_like particles from cloned cDNAs of Thogoto virus. J. Gen. Virol. 81:2849_53. 7. E. Wagner, O. G. Engelhardt, S. Gruber, O. Haller, and G. Kochs. (2001) Rescue of recombinant Thogoto virus from cloned cDNA. J. Virol. 75:9282_9286. 8. O. G. Engelhardt*, E. Ullrich*, G. Kochs, and O. Haller. (2001) Interferon_induced antiviral Mx1 GTPase is associated with components of the SUMO_1 system and promyelocytic leukemia protein nuclear bodies. Exp. Cell Res. 271:286_295. 9. O. G. Engelhardt, C. Boutell, A. Orr, E. Ullrich, O. Haller, and R. D. Everett. (2003) The homeodomain_interacting kinase PKM (HIPK_2) modifies ND10 through both its kinase domain and a SUMO_1 interaction motif and alters the posttranslational modification of PML. Exp. Cell Res. 283:36_50. 10. O. G. Engelhardt, H. Sirma, P._P. Pandolfi, and O. Haller. (2004) Mx1 GTPase accumulates in distinct nuclear domains and inhibits influenza A virus in cells that lack promyelocytic leukaemia protein nuclear bodies. J. Gen. Virol. 85:2315_2326. 11. O. G. Engelhardt, M. Smith, and E. Fodor. (2005) Association of the influenza A virus RNA_dependent RNA polymerase with cellular RNA polymerase II. J. Virol. 79:5812_5818. 12. A. Y. Chan, F. T. Vreede, M. Smith, O. G. Engelhardt, and E. Fodor. (2006) Influenza virus inhibits RNA polymerase II elongation. Virology 351:210_217. 13. T. Deng*, O. G. Engelhardt*, B. Thomas, A. V. Akoulitchev, G. G. Brownlee, and E. Fodor. (2007) Role of Ran Binding Protein 5 in nuclear import and assembly of the influenza virus RNA polymerase complex. J. Virol. 80:11911_11919. 14. R. Harvey, J. X. Wheeler, C. L. Wallis, J. S. Robertson, and O. G. Engelhardt. (2008) Quantitation of haemagglutinin in H5N1 influenza viruses reveals low haemagglutinin content of vaccine virus NIBRG_14 (H5N1). Vaccine. 26:6550_6554. 15. I. G. Barr, J. McCauley, N.

Cox, R. Daniels, O. G. Engelhardt, K. Fukuda, G. Grohmann, A. Hay, A. Kelso, A. Klimov, T. Odagiri, D. Smith, C. Russell, M. Tashiro, R. Webby, J. Wood, Z. Ye, W. Zhang, Writing Committee of the World Health Organization on Northern Hemisphere Influenza Vaccine Composition for 2009_2010. (2010) Epidemiological, antigenic and genetic characteristics of seasonal influenza A(H1N1), A(H3N2) and B influenza viruses: Basis for the WHO recommendation on the composition of influenza vaccines for use in the 2009_2010 Northern Hemisphere season. Vaccine. 28:1156_1167. 16. R. Harvey, C. Nicolson, R. E. Johnson, K. A. Guilfoyle, D. L. Major, J. S. Robertson, and O. G. Engelhardt. (2010) Improved haemagglutinin antigen content in H5N1 candidate vaccine viruses with chimeric haemagglutinin molecules. Vaccine. 28:8008_8014. 17. J. S. Robertson, C. Nicolson, R. Harvey, R. Johnson, D. Major, K. Guilfoyle, S. Roseby, R. Newman, R. Collin, C. Wallis, O. G. Engelhardt, J. M. Wood, J. Le, R. Manojkumar, B. A. Pokorny, J. Silverman, R. Devis, D. Bucher, E. Verity, C. Agius, S. Camuglia, C. Ong, S. Rockman, A. Curtis, P. Schoofs, O. Zoueva, H. Xie, X. Li, Z. Lin, Z. Ye, L. M. Chen, E. O'Neill, A. Balish, A. S. Lipatov, Z. Guo, I. Isakova, C. T. Davis, P. Rivailler, K. M. Gustin, J. A. Belser, T. R. Maines, T. M. Tumpey, X. Xu, J. M. Katz, A. Klimov, N. J. Cox, R. O. Donis. (2011) The development of vaccine viruses against pandemic A(H1N1) influenza. Vaccine. 29:1836_1843. (doi:10.1016/j.vaccine.2010.12.044) 18. R. Harvey, K. A. Guilfoyle, S. Roseby, J. S. Robertson and O. G. Engelhardt. (2011) Improved antigen yield in pandemic H1N1 (2009) candidate vaccine viruses with chimeric haemagglutinin molecules. J. Virol. 85:6086_6090. 19. E. Hutchinson, O. Orr, S. M. Liu, O. G. Engelhardt and E. Fodor. (2011) Characterisation of the interaction between the influenza A virus polymerase subunit PB1and the host nuclear import factor Ran Binding Protein 5. J. Gen. Virol. 92:1859_1869. 20. C. Nicolson, R. Harvey, R. Johnson, K. Guilfoyle, O. G. Engelhardt and J. S. Robertson. (2012) An additional oligosaccharide moiety in the HA of a pandemic influenza H1N1 candidate vaccine virus confers increased antigen yield in eggs. Vaccine. 30:745_751. 21. R. Harvey, M. Hamill, J. S. Robertson, P. Minor, G. M. Vodeiko, J. P. Weir, H. Takahashi, Y. Harada, S. Itamura, P. Bamford, T. Dalla Pozza, O. G. Engelhardt. (2012) Application of deglycosylation to SDS PAGE analysis improves calibration of influenza antigen standards. Biologicals 40:96_99. 22. R. E. Johnson, M. Hamill, R. Harvey, C. Nicolson, J. S. Robertson, O. G. Engelhardt. (2012) Permissible variation in the 3' non_coding region of the haemagglutinin genome segment of the H5N1 candidate vaccine virus NIBRG_14. PLoS ONE 7(5):e36241. doi:10.1371/journal.pone.0036241 23. A. I. Klimov, R. Garten, C. Russell, I. G. Barr, T. G. Besselaar, R. Daniels, O. G. Engelhardt, G. Grohmann, S. Itamura, A. Kelso, J. McCauley, T. Odagiri, D. Smith, M. Tashiro, X. Xu, R. Webby, D. Wang, Z. Ye, S. Yuelong, W. Zhang , N. Cox , Writing Committee of the World Health Organization Consultation on Southern Hemisphere Influenza Vaccine Composition for 2012. (2012) WHO recommendations for the viruses to be used in the 2012 Southern Hemisphere Influenza Vaccine: Epidemiology, antigenic and genetic characteristics of influenza A(H1N1)pdm09, A(H3N2) and B influenza viruses collected from February to September 2011. Vaccine. 30:6461_6471. (doi:10.1016/j.vaccine.2012.07.089) 24. R. Harvey, R. E. Johnson, K. MacLellan_Gibson, J. S. Robertson, O. G. Engelhardt. (2014) A promoter mutation in the haemagglutinin segment of influenza A virus generates an effective candidate live attenuated vaccine. Influenza and Other Respiratory Viruses. 8:605_612. (doi:10.1111/irv.12274) 25. S. E. Hufton, P. Risley, C. R. Ball, D. Major, O.G. Engelhardt, S. Poole. (2014) The breadth of cross sub_type neutralisation activity of a single domain antibody to influenza hemagglutinin can be increased by antibody valency. PLoS ONE 9(8): e103294. doi:10.1371/journal.pone.0103294. 26. I. G. Barr, C. Russell, T. G. Besselaar, N. J. Cox, R. S. Daniels, R. Donis, O. G. Engelhardt, G. Grohmann, S. Itamura, A. Kelso, J. McCauley, T. Odagiri, S. Schultz_Cherry, Y. Shu, D. Smith, M. Tashiro, D. Wang, R. Webby, X. Xu, Z. Ye, W. Zhang; Writing Committee of the World Health Organization Consultation on Northern Hemisphere Influenza Vaccine Composition for 2013–2014. (2014) WHO recommendations for the viruses used in the 2013_2014 Northern Hemisphere influenza vaccine: Epidemiology, antigenic and genetic characteristics of influenza A(H1N1)pdm09, A(H3N2) and B influenza viruses collected from October 2012 to January 2013. Vaccine. 32:4713_4725. (doi: 10.1016/j.vaccine.2014.02.014) 27. K. L. Laurie, O. G. Engelhardt, J. Wood, A. Heath, J. M. Katz, M. Peiris, K. Hoschler, O. Hungnes, W. Zhang, M. D. Van Kerkhove. (2015) International Laboratory Comparison of Influenza Microneutralization Assays for A(H1N1)pdm09, A(H3N2), and A(H5N1) Influenza Viruses by CONSISE. Clin Vaccine Immunol. 22(8):957_64. doi: 10.1128/CVI.00278_15. 28. M. C. Eichelberger, L. Couzens, Y. Gao, M. Levine, J. Katz, R. Wagner, C. Thompson, K. Höschler, K. Laurie, T. Bai, O. G. Engelhardt, ELLA study participants, J. Wood. (2016) Comparability of neuraminidase inhibition antibody titers measured by enzyme_linked lectin assay (ELLA) for the analysis of influenza vaccine immunogenicity. Vaccine. 34(4):458_465. doi: 10.1016/j.vaccine.2015.12.022. 29. C. Nicolson, R. Harvey, O. G. Engelhardt, J. S. Robertson. (2016) The Ability of a Non_Egg Adapted (Cell_Like) A(H1N1)pdm09 Virus to Egg_Adapt at HA Loci Other than 222 and 223 and Its Effect on the Yield of Viral Protein. PLoS One. Nov 18;11(11):e0166761. doi: 10.1371/journal.pone.0166761. 30. P. W. Horby, K. L. Laurie, B. J. 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(2018) Establishment of the first WHO International Standard for antiserum to Respiratory Syncytial Virus: Report of an international collaborative study. Vaccine 36(50):7641_7649. doi: 10.1016/j.vaccine.2018.10.087. Epub 2018 Oct 30. 33. W. Dong, Y. Bhide, F. Sicca, T. Meijerhof, K. Guilfoyle, O. G. Engelhardt, L. Boon, C. A. M. de Haan, G. Carnell, N. Temperton, J. de Vries_Idema, D. Kelvin, A. Huckriede. (2018) Cross_Protective Immune Responses Induced by Sequential Influenza Virus Infection and by Sequential Vaccination With Inactivated Influenza Vaccines. Front Immunol. 9:2312. doi: 10.3389/fimmu.2018.02312. eCollection 2018. 34. S. Hussain, M. L. Turnbull, H. M. Wise, B. W. Jagger, P. M. Beard, K. Kovacikova, J. K. Taubenberger, L. Vervelde, O. G. Engelhardt, P. Digard. (2019) Mutation of Influenza A Virus PA_X Decreases Pathogenicity in Chicken Embryos and Can Increase the Yield of Reassortant Candidate Vaccine Viruses. J. Virol. 93(2): e01551_18. doi: 10.1128/JVI.01551_18. 35. W. Ramage, T. Gaiotto, C. Ball, P. Risley, G. W. Carnell, N. Temperton, C. Y. Cheung, O. G. Engelhardt, S. E. Hufton. (2019) Cross_Reactive and Lineage_Specific Single Domain Antibodies against Influenza B Hemagglutinin. Antibodies 8(1), 14; https://doi.org/10.3390/antib8010014 36. S. Hussain, M. L. Turnbull, R. M. Pinto, J. W. McCauley, O. G. Engelhardt, P. Digard. (2019) Segment 2 from influenza A(H1N1) 2009 pandemic viruses confers temperature_sensitive haemagglutinin yield on candidate vaccine virus growth in eggs that can be epistatically complemented by PB2 701D. J Gen Virol. 100(7):1079_1092. doi: 10.1099/jgv.0.001279 37. Y. Bhide, W. Dong, I. Gribonika, D. Voshart, T. Meijerhof, J. de Vries_Idema, S. Norley, K. Guilfoyle, S. Skeldon, O. G. Engelhardt, L. Boon, D. Christensen, N. Lycke, A. Huckriede. (2019) Cross_Protective Potential and Protection_Relevant Immune Mechanisms of Whole Inactivated Influenza Virus Vaccines Are Determined by Adjuvants and Route of Immunization. Front Immunol. 10:646. doi: 10.3389/fimmu.2019.00646. eCollection 2019. 38. J. U. McDonald, P. Rigsby, E. Atkinson, O. G. Engelhardt, Study Participants. (2020) Expansion of the 1st WHO international standard for antiserum to respiratory syncytial virus to include neutralisation titres against RSV subtype B: An international collaborative study. Vaccine 38(4):800_807. doi: 10.1016/j.vaccine.2019.10.095 39. J. M. M. Del Rosario, M. Smith, K. Zaki, P. Risley, N. Temperton, O. G. Engelhardt, M. Collins, Y. Takeuchi, S. E. Hufton. (2020) Protection From Influenza by Intramuscular Gene Vector Delivery of a Broadly Neutralizing Nanobody Does Not Depend on Antibody Dependent Cellular Cytotoxicity. Front Immunol. 11:627. doi: 10.3389/fimmu.2020.00627 40. B. Vidaña, S. M. Brookes, H. E. Everett, F. Garcon, A. Nuñez, O. Engelhardt, D. Major, K. Hoschler, I. H. Brown, M. Zambon. (2020) Inactivated pandemic 2009 H1N1 influenza A virus human vaccines have different efficacy after homologous challenge in the ferret model. Influenza Other Respir Viruses. Aug 11. doi: 10.1111/irv.12784. Online ahead of print. 41. K. Guilfoyle, D. Major, S. Skeldon, H. James, J. L. Tingstedt, C. Polacek, R. Lassauniére, O. G. Engelhardt#, A. Fomsgaard. (2020) Protective efficacy of a polyvalent influenza A DNA vaccine against both homologous (H1N1pdm09) and heterologous (H5N1) challenge in the ferret model. Vaccine. Oct 6;S0264_410X(20)31233_0. doi: 10.1016/j.vaccine.2020.09.062. Online ahead of print. 42. J. M. Carreño, J. U. McDonald, T. Hurst, P. Rigsby, E. Atkinson, L. Charles, R. Nachbagauer, M. A. Behzadi, S. Strohmeier, L. Coughlan, T. Aydillo, B. Brandenburg, A. García_Sastre, K. Kaszas, M. Z. Levine, A. Manenti, A. B. McDermott, E. Montomoli, L. Muchene, S. R. Narpala, R. A. P. M. Perera, N. C. Salisch, S. A. Valkenburg, F. Zhou, O. G. Engelhardt#, and F. Krammer#. (2020) Development and Assessment of a Pooled Serum as Candidate Standard to Measure Influenza A Virus Group 1 Hemagglutinin Stalk_Reactive Antibodies. Vaccines, 8, 666; doi:10.3390/vaccines8040666. 43. T. Gaiotto, W. Ramage, C. Ball, P. Risley, G. W. Carnell, N. Temperton, O. G. Engelhardt, S. E. Hufton. (2021) Nanobodies mapped to cross_reactive and divergent epitopes on A(H7N9) influenza hemagglutinin using yeast display. Sci Rep. 11(1):3126. doi:

10.1038/s41598_021_82356_4. 44. J. Waldock, L. Zheng, E. J. Remarque, A. Civet, B. Hu, S. Lartey Jalloh, R. J. Cox, S. Ho, K. Hoschler, T. Ollinger, C. M. Trombetta, O. G. Engelhardt, C. Caillet. (2021) Assay Harmonization and Use of Biological Standards To Improve the Reproducibility of the Hemagglutination Inhibition Assay: a FLUCOP Collaborative Study. mSphere 6:e00567_21. doi: 10.1128/mSphere.00567_21. 45. M._C. Bernard, J. Waldock, S. Commandeur, L. Strauß, C. M. Trombetta, S. Marchi, F. Zhou, S. Van de Witte, P. Van Amsterdam, S. Ho, K. Hoschler, V. Lugovtsev, J. P. Weir, E. Montomoli, R. J. Cox, O. G. Engelhardt, D. Friel, R. Wagner, T. Ollinger, S. Germain, H. Sediri_Schön and FLUCOP consortium collaborators. (2022) Validation of a Harmonized Enzyme_Linked_Lectin_Assay Based Neuraminidase Inhibition Assay Standard Operating Procedure for Quantification of N1 Influenza Antibodies and the Use of a Calibrator to Improve the Reproducibility of the ELLA_NI With Reverse Genetics Viral and Recombinant Neuraminidase Antigens: A FLUCOP Collaborative Study. Frontiers in Immunology, Volume 13, Article 909297. doi: 10.3389/fimmu.2022.909297 46. C. Y. Cheung, S. Dubey, M. Hadrovic, C. R. Ball, W. Ramage, J. U. McDonald, R. Harvey, S. E. Hufton and O. G. Engelhardt. (2022) Development of an ELISA_Based Potency Assay for Inactivated Influenza Vaccines Using Cross_Reactive Nanobodies. Vaccines, 10, 1473. https://doi.org/10.3390/vaccines10091473 Meeting Reports, Reviews, and Book Chapters: 45. T. Muster, B. Ferko, A. Klima, M. Purtscher, P. Schulz, A. Grassauer, H. Katinger, O. Engelhardt, A. García_Sastre and P. Palese, (1995) Secretory antibodies against HIV_1 induced by a chimeric influenza virus. In Vaccines 95. Cold Spring Harbor Laboratory Press. 46. T. Muster, B. Ferko, A. Grassauer, A. Klima, D. Katinger, M. Purtscher, H. Katinger, O. G. Engelhardt, A. García_Sastre and P. Palese. (1996) Long_lasting systemic and mucosal humoral immune responses against the HIV_1 gp41_specific epitope ELDKWA induced by a chimeric influenza virus. In Vaccines 96. Cold Spring Harbor Laboratory Press. 47. P. Palese, H. Zheng, O. G. Engelhardt, S. Pleschka and A. García_Sastre. (1996) Negative_strand RNA viruses: Genetic engineering and applications. Proc. Natl. Acad. Sci. USA 93: 11354_11358. 48. H. E. Gilleland, Jr., L. B. Gilleland, J. Staczek, R. N. Harty, A. García_Sastre, O. G. Engelhardt and P. Palese. (1997) Chimeric influenza viruses incorporating epitopes of outer membrane protein F as a vaccine against infection with Pseudomonas aeruginosa. Behring. Inst. Mitt. 98: 291_301. 49. G. Kochs, O. G. Engelhardt, and O. Haller. (2002) Mx proteins: high molecular weight GTPases with antiviral activity. In: „Handbook of Cell Signaling" Vol. 2, 771_775. 50. O. G. Engelhardt and E. Fodor. (2006) Functional association between viral and cellular transcription during influenza virus infection. Rev. Med. Virol. 16: 329_345. 51. E. Fodor, O. G. Engelhardt, M. Smith, J. Sharps, G. G. Brownlee, and T. Deng. (2008) Nuclear import and assembly of the influenza virus RNA polymerase complex. In Options for the Control of Influenza VI, Proceedings of the International Conference. 90_92. 52. P. D. Minor, O. G Engelhardt, J. M. Wood, J. S. Robertson, S. Blayer, T. Colegate, L. Fabry, J. G. Heldens, Y. Kino, O. Kistner, R. Kompier, K. Makizumi, J. Medema, S. Mimori, D. Ryan, R. Schwartz, J. S. Smith, K. Sugawara, H. Trusheim, T. F. Tsai, and R. Krause. (2009) Conference Report: Current challenges in implementing cell_derived influenza vaccines: implications for production and regulation, July 2007, NIBSC, Potters Bar, UK. 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Oxford (editor), Future Medicines Ltd. doi:10.2217/9781780843605 57. S. Schultz_Cherry, R. J. Webby, R. G. Webster, A. Kelso, I. G. Barr, J. W. McCauley, R. S. Daniels, D. Wang, Y. Shu, E. Nobusawa, S. Itamura, M. Tashiro, Y. Harada, S. Watanabe, T. Odagiri, Z. Ye, G. Grohmann, R. Harvey, O. Engelhardt, D. Smith, K. Hamilton, F. Claes, G. Dauphin. (2014) Influenza Gain_of_Function Experiments: Their Role in Vaccine Virus Recommendation and Pandemic Preparedness. mBio 5(6):e02430_14. doi:10.1128/mBio.02430_14. 58. S. Pavlova, F. D'Alessio, S. Houard, E. J. Remarque, N. Stockhofe, O. G. Engelhardt. (2017) Workshop report: Immunoassay standardisation for "universal" influenza vaccines. Influenza Other Respir Viruses. 11:194–201. doi: 10.1111/irv.12445 59. J. R. Ortiz, J. Hickling, R. Jones, A. Donabedian, O. G. Engelhardt, J. M. Katz, S. A. Madhi, K. M. Neuzil, G. F. Rimmelzwaan, J. Southern, D. J. Spiro, J. Hombach. 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Influenza Other Respir Viruses. 2019 Dec 13. doi: 10.1111/irv.12706. 63. A. Tung Yep, Y Takeuchi, O. G. Engelhardt, S. Hufton. (2021) Broad Reactivity Single Domain Antibodies against Influenza Virus and Their Applications to Vaccine Potency Testing and Immunotherapy. Biomolecules 2021, 11, 407. https://doi.org/10.3390/biom11030407 Note: *…..equal contribution #……corresponding author

Projects

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Other Relevant Information