

VIRUS-LIKE PARTICLE & NANO-PARTICLE VACCINES

22-24 June 2016, Leiden University Medical Centre, Leiden, The Netherlands

FINAL ORAL PROGRAMME & POSTER PROGRAMME

VLPNV 2016

SCIENTIFIC ADVISORY PANEL

Martin Bachmann (*University of Oxford, Oxford, UK / University of Bern, Bern, Switzerland*)

Bryce Chackerian (*University of New Mexico, Albuquerque, New Mexico, USA*)

Marc-Andre D'Aoust (*Medicago Inc., Quebec, Canada*)

Greg Glenn (*Novavax Inc., Rockville, Maryland, USA*)

Melissa M. Herbst-Kralovetz (*University of Arizona, Phoenix, Arizona, USA*)

George Lomonosoff (*John Innes Centre, Norwich, UK*)

Ann Meyers (*University of Cape Town, South Africa*)

Peter Pushko (*Medigen Inc., Frederick, Maryland, USA*)

Charles Richardson (*Takeda Vaccines, Bozeman, Montana, USA*)

Ted Ross (*University of Georgia, Athens, Georgia, USA*)

Polly Roy (*London School of Hygiene & Tropical Medicine, London, UK*)

Ferry Ossendorp (*LUMC, Leiden University, Leiden, The Netherlands*)

Brian Ward (*McGill University, Montreal, Quebec, Canada*)

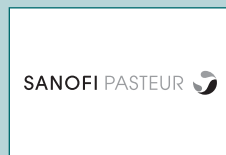
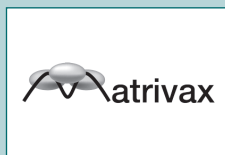
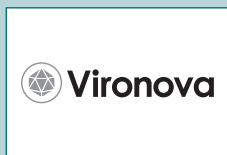
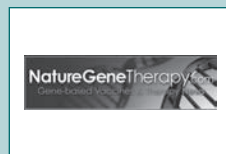
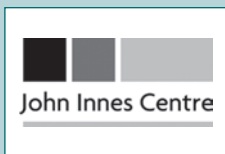
Vidadi Yusibov (*Fraunhofer USA, Newark, Delaware, USA*)

Richard Compans (*Emory University, Atlanta, Georgia, USA*)

Adriana Baz Morelli (*CSL Limited, Parkville, Victoria, Australia*)

Trudy Morrison (*University of Massachusetts, Worcester, Massachusetts, USA*)

Hans Netter (*The Peter Doherty Institute, Melbourne Health, Melbourne, Australia*)



08.30 onwards
Arrival & Registration

SESSION 1: OPENING PLENARY SESSION

Moderator: Trudy G. Morrison
(University of Massachusetts Medical School, Worcester, Massachusetts, USA)

09.30-10.00

'VLPs and other novel vaccine technologies: The role of human viral challenge studies in assessing efficacy and correlates of protection'

Nicolas Noulin
(hVIVO Ltd, London, UK)

10.00-10.30

'Infectious human papillomavirus pseudovirions produced in plants'

Edward P. Rybicki^{1,3}, Renate L. Lamprecht¹, Paul Kennedy¹, Suzanne M. Huddy¹, Susanne Bethke² and Inga I Hitzeroth¹
(¹ University of Cape Town, Rondebosch, South Africa; ² Fraunhofer IME, Aachen, Germany; ³ Institute of Infectious Disease and Molecular Medicine, University of Cape Town, Rondebosch, South Africa)

10.30-11.00

'Targeting atopic dermatitis in horses using next generation virus-like particles'

Martin Bachmann
(University of Bern, Bern, Switzerland / University of Oxford, Oxford, UK)

11.00-11.30

Coffee Break & Poster Set-Up

SESSION 2: PLENARY II

Moderator: George Lomonosoff
(John Innes Centre, Norwich, UK)

11.30-12.00

'Conformation of a protein in virus-like particles impacts their efficacy as vaccines'

Trudy G. Morrison^{1,2}, Lori W. McGinnes¹, Jorge Blanco³, Madelyn R. Schmidt^{1,2}, Sarah Kenward¹ and Robert Woodland^{1,2}
(¹ Department of Microbiology and Physiological Systems; ² Program in Immunology and Microbiology, University of Massachusetts Medical School, Worcester, Massachusetts, USA; ³ Sigmovir Biosystems, Rockville, Maryland, USA)

12.00-12.30

'Structure-based designer vaccines for Orbiviruses'

Polly Roy
(London School of Hygiene & Tropical Medicine, London, UK)

12.30-13.00

'Synthetic Virus-Like Particles (SVLPs) for the development of fully synthetic vaccines'

Armando Zuniga
(Virometix AG, Schlieren, Switzerland)

13.00-14.00

Lunch Break & Posters

SESSION 3: VIRUS LIKE PARTICLES I

Moderator: Ted Ross
(University of Georgia, Athens, Georgia, USA)

14.00-14.30

'Biochemically modified virus-like particles with enhanced

immunogenicity and superior platform capabilities'

Hans J. Netter¹, Natalie Kingston² and Michiko Hyakumura²
(¹ The Peter Doherty Institute, Melbourne Health, Melbourne, Australia; ² Monash University, Clayton, Victoria, Australia)

14.30-15.00

'Role of TLRs in induction of antibody responses to ND VLPs containing the respiratory syncytial Virus F and G glycoprotein ectodomains'

Trudy G. Morrison^{1,2}, Lori W. McGinnes-Cullen¹, Robert T. Woodland^{1,2}, Sarah A. Kenward¹ and Madelyn R. Schmidt^{1,2}
(¹ Department of Microbiology and Physiological Systems, ² Program in Immunology and Microbiology, University of Massachusetts Medical School, Worcester, Massachusetts, USA)

15.00-15.30

'Development of a virus like particles (VLP) production and purification process for vaccines: overview and case study'

Anissa Boumlic-Courtade
(Merck Life Science, Process Solutions, Molsheim, France)

15.30-16.00

'Requirements for respiratory syncytial virus-like particle formation'

Chetan Meshram¹, Pradyumna Baviskar², Cherie Ognibene¹ and Tom Oomens¹
(¹ Oklahoma State University, Stillwater, Oklahoma, USA; ² St. Jude Children's Research Hospital, Memphis, Tennessee, USA)

16.00-16.30

Tea Break & Posters

SESSION 4: NANOPARTICLES

Moderator: Hans J. Netter
(The Peter Doherty Institute, Melbourne Health, Melbourne, Australia)

16.30-17.00

'High resolution structural analysis of cowpea mosaic virus (CPMV) empty virus-like particles (eVLPs) reveals how this nanoparticle can be further developed for use in bionanotechnology'

Emma Hesketh¹, Yulia Meshcheriakova², Pooja Saxena², Kyle Dent¹, Neil Ranson¹, Nhung Huynh³, Vijay Reddy³ and George Lomonosoff²
(¹ University of Leeds, Leeds, UK; ² John Innes Centre, Norwich, UK; ³ The Scripps Research Institute, La Jolla, California, USA)

17.00-17.20

'Ferritin nanoparticles containing stabilized HIV-1 native-like envelope trimers as immunogens'

Kwinten Slieden¹, Gabriel Ozorowski², Juan Miguel Camacho-Sánchez¹, Alba Torrents de la Peña¹, Christopher Cottrell², Anna Schorcht¹, Steven W. de Taeye¹, Tom L. G. M. van den Kerkhof¹, Laura Pritchard³, Jonathan L. Torres², Judith A. Burger¹, Ilja Bontjer¹, Mitch Hartog¹, Max Crispin³, John P. Moore⁴, Andrew B. Ward² and Rogier W. Sanders^{1,4}
(¹ University of Amsterdam, Amsterdam, The Netherlands; ² The Scripps Research Institute, La Jolla, California, USA; ³ University of Oxford, Oxford UK; ⁴ Weill Medical College of Cornell University, New York, New York, USA)

17.20-17.40

'Cell penetrating peptide based nanoparticles: Potent cytotoxic T-cell inducing vaccines'

Vimal Kumar¹, Ans De Beuckelaer¹, Joanne McCaffrey², Helen O. McCarthy², Johan Grooten¹ and Stefaan De Koker¹
(¹ Ghent University, Ghent, Belgium; ² Queen's University Belfast, Belfast, Northern Ireland, UK)

17.40-19.00

VLPNPV 2016 Welcome Drinks Reception & Poster Session

SESSION 5 INFLUENZA I

Moderator: Ed P. Rybicki (*University of Cape Town, Rondebosch, South Africa*)

09.00-09.30

'Progress in the clinical development of the plant-made influenza VLP Vaccines'

E. Aubin¹, S. Pillet^{1,2}, S. Trépanier¹, N. Charland¹, B.J. Ward² and N. Landry¹
(¹ *Medicago Inc., Quebec, Quebec, Canada*; ² *Research Institute of the McGill University Health Centre University, Montreal, Quebec, Canada*)

09.30-10.00

'Multi-subtype virus-like particles (VLPs) as broadly protective influenza vaccines'

Irina Tretyakova, Rachmat Hidajat and Peter Pushko
(*Medigen, Inc., Frederick, Maryland, USA*)

10.00-10.20

'Production of virus-like particles containing influenza HA and NA in suspension culture of HEK293 cells'

Rénauld Gilbert¹, Alina Venereo-Sanchez^{1,2}, Aziza Manceur¹, Parminder Chahal¹, Sven Ansorge¹, Wangxue Chen³ and Amine Kamen⁴ (¹ *National Research Council Canada, Montreal, Quebec, Canada*; ² *Ecole Polytechnique, Université de Montréal, Montreal, Quebec, Canada*; ³ *National Research Council Canada, Ottawa, Ontario, Canada*; ⁴ *McGill University, Montréal, Quebec, Canada*)

10.20-10.40

'Combining stable and baculovirus-mediated expression towards production of an universal influenza VLP-based vaccine'

Daniela Sequeira^{1,2}, Ricardo Correia¹, Manuel J.T. Carrondo^{1,2}, António Roldão^{1,2}, Ana P. Teixeira^{1,2} and Paula M. Alves^{1,2} (¹ *iBET, Instituto de Biologia Experimental e Tecnológica, Oeiras, Portugal*; ² *Instituto de Tecnologia Química e Biológica António Xavier, Universidade Nova de Lisboa, Oeiras, Portugal*)

10.40-11.10

Coffee Break & Posters

SESSION 6: VIRUS LIKE PARTICLES II

Moderator: Marc-Andre D'Aoust (*Medicago Inc., Quebec, Canada*)

11.10-11.40

'Virus-like particle versus purified protein immunization of humanized mice: Comparative analysis of human antibody responses'

Madelyn R. Schmidt^{1,2}, Trudy G. Morrison^{1,2}, Sarah A. Kenward¹, Lori W. McGinnes-Cullen¹, George K. Lewis³ and Robert T. Woodland^{1,2}
(¹ *Department of Microbiology and Physiological Systems, ² Program in Immunology and Microbiology, University of Massachusetts Medical School, Worcester, Massachusetts, USA*; ³ *Institute of Human Virology, University of Maryland, Baltimore, Maryland, USA*)

11.40-12.00

'Transient expression of polio vlps in *n.benthamiana*: Developing a synthetic polio vaccine'

J.D. Marsian and George P. Lomonosoff (*John Innes Centre, Norwich, UK*)

12.00-12.20

'Lyophilised plant tissue bearing VLPs of HBV small surface antigen for the oral vaccine against hepatitis B'

Marcin Czyz¹, Radosław Dembczynski², Roman Marecik², Justyna Wojas-Turek³, Magdalena Milczarek³, Elzbieta Pajtasz-Piasecka³, Joanna Wietrzyk³ and Tomasz Pniewski¹
(¹ *Institute of Plant Genetics Polish Academy of Sciences, Poznan, Poland*; ² *Poznan University of Life Sciences, Poznan, Poland*; ³ *Institute of Immunology and Experimental Therapy Polish Academy of Sciences, Wrocław, Poland*)

12.20-12.40

'Novel Epstein-Barr virus-like particles incorporating envelope membrane surface glycoproteins and latency proteins as potential polyvalent candidate vaccines'

Elizabeth Perez², Anne K. Barasa^{1,3}, Joslyn Foley¹, Timelia Tison², Trudy G. Morrison² and Javier Gordon Ogembo¹ (¹ *Beckman Research Institute of City of Hope*; ² *University of Massachusetts Medical School*; ³ *University of Nairobi*)

12.40-14.00

Lunch Break & Posters

SESSION 7: INFLUENZA II

Moderator: Peter Pushko (*Medigen, Inc., Frederick, Maryland, USA*)

14.00-14.20

'A non-toxic formulation of CTA1-3M2e-DD in lipidic nanoparticles for effective mucosal immunization against influenza virus'

V. Bernasconi¹, S. Burazerovic², K. Norling², M. Bally², K. Shön¹, F. Höök² and N. Lycke¹ (¹ *University of Gothenburg, Gothenburg, Sweden*; ² *Chalmers University of Technology, Gothenburg, Sweden*)

14.20-14.40

'Hbc virus-like particles carrying multiple copies of influenza virus M2e peptide as a promising broad-specificity vaccine against influenza'

Elena A. Blokhina and Nikolai V. Ravin (*Research Center of Biotechnology of the Russian Academy of Sciences, Moscow, Russia*)

14.40-15.00

'Universal label-free in-process analytical tool for influenza virus-like particles quantification'

Sofia Carvalho¹, Mafalda Moleirinho², David Wheatley³, John Welsh³, René Gantier⁴, Cristina Peixoto¹, Paula Alves¹ and Manuel Carrondo⁵
(¹ *iBET/ITQB-UNL, Portugal*; ² *iBET, Portugal*; ³ *Pall Life Sciences, UK*; ⁴ *Pall Life Sciences, USA*; ⁵ *iBET/ITQB-UNL/FCI-UNL, Portugal*)

15.00-15.30

Tea Break & Posters

SESSION 8: STRUCTURAL PROPERTIES

Moderator: Polly Roy (*London School of Hygiene & Tropical Medicine, London, UK*)

15.30-16.00

'A template-directed assembly approach for structural study of immature HIV'

Pooja Saxena¹, Li He², Andrey Malyutin¹ and Bogdan Dragnea¹
(¹ *Department of Chemistry, Indiana University, Bloomington, Indiana, USA*; ² *Biochemistry Program, Indiana University, Bloomington, Indiana, USA*)

16.00-16.20

'Immunological properties of *Mycobacterium tuberculosis* antigens immobilized on polyester beads'

Patricia Rubio Reyes¹, Natalie A. Parlane², D. Neil Wedlock² and Bernd H.A. Rehm^{1,3,4}

(¹ *Institute of Fundamental Sciences, Massey University, Palmerston North, New Zealand*; ² *AgResearch, Hopkirk Research Institute, Palmerston North, New Zealand*; ³ *MacDiarmid Institute for Advanced Materials and Nanotechnology, Wellington, New Zealand*; ⁴ *Polybatics Ltd., Palmerston North, New Zealand*)

16.20-16.40

'Plug-and-display: Virus-like particles decorated using bacterial superglues as a platform to accelerate vaccine generation'

Karl D. Brune¹, Darren Leneghan², Martin F. Bachmann^{2,3}, Simon J. Draper², Sumi Biswas² and Mark Howarth¹
(¹ *University of Oxford, Oxford, UK*; ² *Jenner Institute, University of Oxford, Oxford, UK*; ³ *University Institute of Immunology, University of Bern, Bern, Switzerland*)

**SESSION 9:
VACCINES DEVELOPMENT**

Moderator: Martin Bachmann

(University of Bern, Bern, Switzerland / University of Oxford, Oxford, UK)

09.00-09.30

'Customized vaccine design & antigen delivery through novel enveloped virus-like particles'

Marc Kirchmeier

(VBI Vaccines, Cambridge, Massachusetts, USA)

09.30-10.00

'Recent advances in recombinant protein-based malaria vaccines'

Rebecca Dabbs

(Jenner Institute, University of Oxford, Oxford, UK)

10.00-10.30

'Developing a tobacco mosaic virus epitope display vaccine for lumpy skin disease'

Kelvin Phiri¹, Prof. S.W. Mpoloka¹, Dr. M. Leteane¹ and Dr. L.K. Grill²

(¹ University of Botswana; ² Pitzer College, USA)

10.30-11.00

'Bacterial superglue enables easy development of efficient virus-like particle based vaccines'

Christoph M. Janitzek, Susan Thrane, Sungwa Matondo, Mafalda Resende, Tobias Gustavsson, Willem Adriaan de Jongh, Stine Clemmensen, Will Roeffen, Marga van de Vegte Bolmer, Geert Jan van Gemert, Robert Sauerwein, John T. Schiller, Morten A. Nielsen, Thor G. Theander, Ali Salanti and Adam F. Sander (University of Copenhagen, Copenhagen, Denmark)

11.00-11.30

Coffee Break & Posters

**SESSION 10:
VLP DEVELOPMENT FORMATION & DELIVERY**

Moderator: Tom Oomens

(Oklahoma State University, Stillwater, Oklahoma, USA)

11.30-12.00

'Tobacco mosaic virus as a nanocarrier for phenanthriplatin'

Anna E. Czapar¹, Yao-Rong Zheng², Imogen A. Riddell², Sourabh Shukla¹, Samuel G. Awuah², Stephen J. Lippard² and Nicole F. Steinmetz¹

(¹ Case Western Reserve University, Cleveland, Ohio, USA; ² Massachusetts Institute of Technology, Cambridge, Massachusetts, USA)

12.00-12.20

'Controlled delivery of PCV2 virus-like particles coated with sulphate chitosan: Understanding viral cell receptor mimicking for rational vaccine developing'

Sergio A. Bucarey¹, Juan Mena¹, Camilo Galvez¹, Victor Neira³, Patricio Vasquez-Quitral² and Andrés Neira-Carrillo²

(¹ Centro Biotecnológico Veterinario (Bioveteq); ² Laboratory of Functionalized Polymers and Biomolecules (Polyforms), Departamento de Ciencias Biológicas Animales, Facultad de Ciencias Veterinarias y Pecuarias, Universidad de Chile; ³ Laboratorio de Virología, Departamento de Medicina Preventiva, Facultad de Ciencias Veterinarias y Pecuarias, Universidad de Chile, La Pintana, Santiago, Chile)

12.20-12.40

'Development of a plant-made recombinant virus-like particle (VLP) vaccine against African horse sickness'

S.J. Dennis, I.I. Hitzeroth, A.E. Meyers and E.P. Rybicki

(University of Cape Town, Rondebosch, South Africa)

12.40-14.00

Lunch Break & Posters

**SESSION 11:
SHORT POSTER PRESENTATIONS**

Moderator: George Lomonosoff

(John Innes Centre, Norwich, UK)

14.00-14.15 – Poster 106

'Immunogenicity of viral membrane proteins produced in artificial cell membranes'

Hans-Peter de Hoog, Fabien Décaillot, Xingfang Su, Sourabh Banerjee, Tom Cornell and Madhavan Nallani

(ACM Biolabs, Singapore)

14.15-14.30 – Poster 109

'VLP based vaccine candidates against Lyme borreliosis'

Svetlana Kotelovica, Andris Dishlers, Velta Ose and Kaspars Tars

(Biomedical Research and Study Center, Riga, Latvia)

14.30-14.45 – Poster 114

'Generalized Modules for Membrane Antigens (GMMA) compared to conjugation to CRM₁₉₇ for an O-antigen based vaccine against non-typhoidal Salmonella'

F. Micoli¹, S. Rondini¹, R. Alfini¹, L. Lanzilao¹, F. Necchi¹, O. Rossi²,

P. Mastroeni², C.A. MacLennan³ and A. Saul¹

(¹ GSK Vaccines Institute For Global Health (GVGH) S.r.l., Siena, Italy; ² University of Cambridge, Cambridge, UK; ³ University of Oxford, Oxford, UK)

14.45-15.00 – Poster 113

'Characterization of generalized modules for membrane antigens (GMMA) vaccine against non-typhoidal Salmonella'

R. Alfini¹, G. De Benedetto^{1,2}, R. Di Benedetto¹, P. Cescutti², M. Caboni¹, L. Lanzilao¹, F. Necchi¹, A. Saul¹, C.A. MacLennan¹, S. Rondini¹ and F. Micoli¹

(¹ GSK Vaccines Institute For Global Health (GVGH) S.r.l., Siena, Italy; ² Università degli Studi di Trieste, Trieste, Italy)

15.00-15.15 – Poster 115

'Peptide display on bacteriophages PP7 and MS2: Structural stability of virus-like particles as potential vaccine platforms'

A.C.V. Santos¹, E.G. Oliveira¹, T.V. Cruz¹, S.P.C. Barroso¹, G.A.P. Oliveira¹, D.S. Peabody², D.F. Ferreira³, Y. Cordeiro⁴, J.L. Silva¹, A.M.O. Gomes¹

and A.C. Oliveira¹

(¹ Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil; ² University of New Mexico; ³ Instituto de Microbiologia Paulo de Góes, UFRJ; ⁴ Faculdade de Farmácia/UFRJ, Brazil)

15.15-15.30 – Poster 102

'Biochemical characterizations of Coxsackievirus A6 viral particles'

Chia-Chyi Liu, Meng-Shin Guo, Shang-Rung Wu, Hsiao-Yu Lin, Ya-Ting Yang, Wei-Chih Liu, Yen-Hung Chow, Dar-Bin Shieh, Jen-Ren Wang and Pele Chong

(National Health Research Institutes, Zhunan Town, Miaoli County, Taiwan)

15.30-15.45 – Poster 118

'Rapid and Robust viral and VLP vaccine characterisation using NTA'

Agnieszka Siupa¹, Charlotte Dodd¹, Jonathan G. Mehtala², Pauline Carnell³ and Duncan Griffiths⁴

(¹ Malvern Instruments Limited, Malvern, Worcestershire, UK; ² Malvern Instruments, Westborough, Massachusetts, USA; ³ Malvern Instruments Limited, Amesbury, Wiltshire, UK; ⁴ Malvern Instruments, Rancho Cucamonga, California, USA)

15.45

Conference Close, Tea & Departure

* This final programme is correct at the time of publication. However the organizers reserve the right to make any alterations that may be required in the interests and integrity of the conference programme.

Poster 101

'Development of a plant-made recombinant virus-like particle (VLP) vaccine against African horse sickness'

S.J. Dennis, I.I. Hitzeroth, A.E. Meyers and E.P. Rybicki
(University of Cape Town, Rondebosch, South Africa)

Poster 102

'Biochemical characterizations of Coxsackievirus A6 viral particles'

Chia-Chyi Liu, Meng-Shin Guo, Shang-Rung Wu, Hsiao-Yu Lin, Ya-Ting Yang, Wei-Chih Liu, Yen-Hung Chow, Dar-Bin Shieh, Jen-Ren Wang and Pele Chong
(National Health Research Institutes, Zhunan Town, Miaoli County, Taiwan)

Poster 103

'Novel delivery systems based on PEGylated polyesters/sorbitan-polyesters for tumor immunotherapy'

Chiung-Yi Huang, Chung-Hsiung Huang and Ming-Hsi Huang
(National Health Research Institutes, Zhunan, Miaoli, Taiwan)

Poster 104

'IL-6 acts as a key cytokine in the enhancement of mucosal immunity following intranasal administration of antigen with cationic liposomes'

Yukihiko Aramaki¹, Rui Tada¹, Emi Honjo¹, Naoko Iwase¹, Hiroshi Kiyono² and Jun Kunisawa³ (¹ Tokyo University of Pharmacy and Life Sciences, Tokyo, Japan; ² The Institute of Medical Science, The University of Tokyo, Tokyo, Japan; ³ National Institute of Biomedical Innovation, Osaka, Japan)

Poster 105

'Generation and presentation of membrane protein targets using virus-like particles'

Lisa Nika¹, Dieter Palmberger^{1,2}, Wolfgang Ernst^{1,2}, Krisztina Koczka^{1,2}, Jakob Wallner¹, Karola Vorauer-Uhl¹ and Reingard Grabherr¹
(¹ University of Natural Resources and Applied Life Sciences, Vienna, Austria; ² ACIB – Austrian Centre of Industrial Biotechnology, Vienna, Austria)

Poster 106

'Immunogenicity of viral membrane proteins produced in artificial cell membranes'

Hans-Peter de Hoog, Fabien Décaillot, Xingfang Su, Sourabh Banerjee, Tom Cornell and Madhavan Nallani
(ACM Biolabs, Singapore)

Poster 107

'Large scale purification of Adeno-Associated Virus (AAV) with continuous flow ultracentrifugation'

Haifeng Chen¹, Sandra Meriño² and Ching Yi Ho¹
(¹ Virovek, Inc., Hayward, California, USA; ² Alfa Wassermann, Inc., West Caldwell, New Jersey, USA)

Poster 108

'New promising VLP-based malaria vaccine candidates'

David Wetzel^{1,2}, Jo-Anne Chan³, Manfred Suckow¹, James Beeson³ and Michael Piontek¹ (¹ ARTES Biotechnology, Langenfeld, Germany; ² Technical University of Dortmund, Dortmund, Germany; ³ Burnet Institute, Melbourne, Australia)

Poster 109

'VLP based vaccine candidates against Lyme borreliosis'

Svetlana Kotelovica, Andris Dishlers, Velta Ose and Kaspars Tars
(Biomedical Research and Study Center, Riga, Latvia)

Poster 110

'Viral engineering for better secretion of Hemagglutinin virus like particles in insect cells'

Krisztina Koczka¹, Florian Strobl¹, Tobias Schneider¹, Dieter Palmberger¹, Wolfgang Ernst^{1,2}, Gary W. Blissard³ and Reingard Grabherr^{1,2}
(¹ Austrian Center of Industrial Biotechnology, Graz, Austria; ² Vienna University of Natural Resources and Life Sciences, Vienna, Austria; ³ Boyce Thompson Institute at Cornell University, Ithaca, New York, USA)

Poster 111

'Virus-like particles as a novel platform for burkholderia protective antigens'

Marc Bayliss¹, Andrew Scott¹, Diane Williamson¹, Mark Davis², Lucy Beales², Michael Whelan³, Robert Field⁴, Sergey Nepogodiev⁴, Giulia Pergolizzi⁴, Timothy Atkins^{1,5} and Joann Prior^{1,5} (¹ Dstl Porton Down, Salisbury, UK; ² Mologic Ltd, Bedford, UK; ³ iQur, London Bioscience and Innovation Centre, London, UK; ⁴ John Innes Centre, Norwich, UK; ⁵ University of Exeter, Exeter, UK)

Poster 112

'Evaluation of virus like particle (VLP) as vaccine candidate against influenza A viruses'

Nishtha Agrawal, Anju Gautam and Madhu Khanna
(Vallabhbhai Patel Chest Institute, University of Delhi, Delhi, India)

Poster 113

'Characterization of generalized modules for membrane antigens (GMMA) vaccine against non-typhoidal Salmonella'

R. Alfani¹, G. De Benedetto^{1,2}, R. Di Benedetto¹, P. Cescutti², M. Caboni¹, L. Lanzilao¹, F. Necchi¹, A. Saul¹, C.A. MacLennan¹, S. Rondini¹ and F. Micoli¹ (¹ GSK Vaccines Institute for Global Health (GVGH) S.r.l., Siena, Italy; ² Università degli Studi di Trieste, Trieste, Italy)

Poster 114

'Generalized Modules for Membrane Antigens (GMMA) compared to conjugation to CRM₁₉₇ for an O-antigen based vaccine against non-typhoidal Salmonella'

F. Micoli¹, S. Rondini¹, R. Alfani¹, L. Lanzilao¹, F. Necchi¹, O. Rossi², P. Mastroeni², C.A. MacLennan³ and A. Saul¹
(¹ GSK Vaccines Institute for Global Health (GVGH) S.r.l., Siena, Italy; ² University of Cambridge, Cambridge, UK; ³ University of Oxford, Oxford, UK)

Poster 115

'Peptide display on bacteriophages PP7 and MS2: Structural stability of virus-like particles as potential vaccine platforms'

A.C.V. Santos¹, E.G. Oliveira¹, T.V. Cruz¹, S.P.C. Barroso¹, G.A.P. Oliveira¹, D.S. Peabody², D.F. Ferreira³, Y. Cordeiro⁴, J.L. Silva¹, A.M.O. Gomes¹ and A.C. Oliveira¹ (¹ Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil; ² University of New Mexico; ³ Instituto de Microbiologia Paulo de Góes, UFRJ; ⁴ Faculdade de Farmácia/UFRJ, Brazil)

Poster 116

'Efficient expression of porcine circovirus type 2 virus-like particles in Escherichia coli'

Guanggang Qu^{1,2}, Zhiqiang Shen^{1,2}, Fengrong Tian¹, Lizhong Miao^{1,2}, Yexing Wu² and Feng Wei^{1,2}
(¹ Shandong Binzhou Animal Science and Veterinary Medicine Academy, Binzhou, PR China; ² Shandong Lvdv Bio-Technology Co., Ltd, Binzhou, PR China)

Poster 117

'High-throughput use of the haemagglutination inhibition assay during Phase 3 clinical trials using large virus panels'

Maarianne Jacquet, Kate Carney, Andrew Catchpole, Daryl Borley, Rob Lambkin-Williams, Lynne Batty, Peter Sargent and Nicolas Noulin (hVIVO Ltd, London, UK)

Poster 118

'Rapid and Robust viral and VLP vaccine characterisation using NTA'

Agnieszka Siupa¹, Charlotte Dodd¹, Jonathan G. Mehtala², Pauline Carnell³ and Duncan Griffiths⁴
(¹ Malvern Instruments Limited, Malvern, Worcestershire, UK; ² Malvern Instruments, Westborough, Massachusetts, USA; ³ Malvern Instruments Limited, Amesbury, Wiltshire, UK; ⁴ Malvern Instruments, Rancho Cucamonga, California, USA)

Poster 119

'Development of VLP-based enterovirus vaccines'

Olli H Laitinen^{1,2}, Minna Hankaniemi¹, Tiia Koho¹, Heikki Hyöty², Malin Flodström-Tullberg^{1,3} and Vesa P. Hytönen¹
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