

# MUCOSAL VACCINES, ADJUVANTS & DELIVERY

14-16 September 2016, CHUV/University of Lausanne, Lausanne, Switzerland

## FINAL ORAL PROGRAMME & POSTER PROGRAMME

# MUCOVAD 2016

### ADVISORY SCIENTIFIC PANEL

Conference Chairman: Richard Walker (PATH, Washington DC, USA)

John Clements (Tulane University, New Orleans, Louisiana, USA)

Jan Holmgren (Gothenburg University, Gothenburg, Sweden)

Edward Lavelle (Trinity College Dublin, Dublin, Ireland)

Eric Cox (University of Ghent, Ghent, Belgium)

Ali Harandi (Gothenburg University, Gothenburg, Sweden)

Dexiang Chen (PATH, Seattle, Washington, USA)

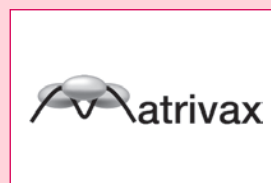
Rob Lambkin-Williams (hVIVO, London, UK)

Dennis Christensen (Statens Serum Institut, Copenhagen, Denmark)

Ted M. Ross (University of Georgia, Athens, Georgia, USA)

Anna-Karin Maltais (Eurocine Vaccines AB, Solna, Sweden)

Niranjan Sardesai (INOVIO Inc., Plymouth Meeting, Pennsylvania, USA)



09.30-10.30

Arrival, Registration, Coffee & Poster Set-Up

10.30-10.45

**Welcome to Lausanne & Opening Remarks**

Richard Walker (*PATH, Washington DC, USA*)

## SESSION 1: OPENING PLENARY SESSION

Moderator: Richard Walker (*PATH, Washington DC, USA*)

10.45-11.30

**'Keeping mucosal vaccines and adjuvants in perspective'**

Ali Harandi (*University of Gothenburg, Gothenburg, Sweden*)

11.30-12.15

**'Distinct mechanisms regulate induction of mucosal versus systemic IgA responses'**

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

12.15-13.00

**'Parenteral or mucosal immunization against rotavirus and norovirus gastroenteritis?'**

Timo Vesikari (*University of Tampere, Tampere, Finland*)

13.00-14.00

Lunch Break & Posters

## SESSION 2: PLENARY SESSION II

Moderator: Ali Harandi (*University of Gothenburg, Gothenburg, Sweden*)

14.00-14.30

**'Oral mucosal immunization provides greater breadth of immunity than injected subunit vaccines'**

Sean Tucker (*VAXART Inc., South San Francisco, California, USA*)

14.30-15.00

**'Challenges for achieving intestinal immunization of infants in developing countries'**

Richard Walker (*PATH, Washington DC, USA*)

15.00-15.30

**'Mucosal adjuvants, intranasal delivery and respiratory vaccines. The way forward?'**

Rob Lambkin-Williams (*hVIVO Ltd, London, UK*)

15.30-16.00

Tea Break & Posters

## SESSION 3: DEVELOPMENT

Moderator: Martin Bachmann

(*University of Berne, Berne, Switzerland/University of Oxford, Oxford, UK*)

16.00-16.30

**'Development of an inactivated nasal influenza vaccine'**

Anna-Karin Maltais (*Eurocine Vaccines AB, Stockholm, Sweden*)

16.30-17.00

**'RSV prefusion F-type subunit vaccines'**

Maarten van Roosmalen (*Mucosis, Groningen, The Netherlands*)

17.00-17.30

**'Mucosal delivery of inactivated polio vaccine'**

Heleen Kraan<sup>1</sup>, Peter Soema<sup>1</sup>, Ivo Ploemen<sup>1</sup>, Jean-Pierre Amorij<sup>1, #</sup> and Gideon Kersten<sup>1, 2</sup> (<sup>1</sup> *Intravacc Institute for Translational Vaccinology, Bilthoven, The Netherlands*; <sup>2</sup> *Leiden Academic Center for Drug Research, Leiden University, Leiden, The Netherlands*; <sup>#</sup> *Current address: Virtuvax BV, The Netherlands*)

17.30-18.30

MUCOVAD 2016 Welcome Drinks & Poster Session

## POSTER SESSION

Poster 101

**'Seminal plasma exposures strengthen vaccine responses in the female reproductive tract mucosae'**

Romain Marlin<sup>1, 2, 3</sup>, Marie-Thérèse Nugeyre<sup>1, 2, 3</sup>, Matteo Parenti<sup>1</sup>, Nathalie Dereuddre-Bosquet<sup>1</sup>, Françoise Barré-Sinoussi<sup>3, 4</sup>, Gabriella Scarlatti<sup>3, 5</sup>, Roger Le Grand<sup>1, 3</sup> and Elisabeth Menu<sup>1, 2, 3</sup> (<sup>1</sup> *Université Paris Sud, Inserm U 1184, Fontenay-Aux-Roses, France*; <sup>2</sup> *MISTIC Group, Institut Pasteur, Paris, France*; <sup>3</sup> *Vaccine Research Institute, Créteil, France*; <sup>4</sup> *Institut Pasteur, Paris, France*; <sup>5</sup> *San Raffaele Scientific Institute, Milan, Italy*)

Poster 102

**Poster withdrawn**

Poster 103

**'Mannosylated chitosan: A potentially universal mucosal vaccine delivery system?'**

Anna Oblensky (*Pacific Genetech, Oxford, UK*)

Poster 104

**'High cellular immunogenicity in mice of a prototype multicomponent DNA vaccine based on HIV-1 clade A enzymes'**

Latanova Anastasia<sup>1, 2, 3</sup>, Petkov Stefan<sup>3</sup>, Athina Kilpeläinen<sup>3</sup>, Juris Jansons<sup>4</sup>, Olga Krotova<sup>1</sup>, Anda Vilmane<sup>4</sup>, Starodubova Elizaveta<sup>2, 3, 5</sup> and Isagulants Maria<sup>1, 3, 4, 5</sup> (<sup>1</sup> *NF Gamaleja Research Center of Epidemiology and Microbiology, Moscow, Russia*; <sup>2</sup> *Engelhardt Institute of Molecular Biology, Moscow, Russia*; <sup>3</sup> *Department of Microbiology, Tumor and Cell Biology, Karolinska Institutet, Stockholm, Sweden*; <sup>4</sup> *Riga Stradins University, Riga, Latvia*; <sup>5</sup> *MP Chumakov Institute of Poliomyelitis and Viral Encephalites, Moscow, Russia*)

Poster 105

**'Immunogenicity evaluation of HIV-1 gp160 formulations in DC-Chol liposomes or polymeric nanoparticles administered via the mucosal route to rhesus monkeys'**

Dalencon François and Florence Boudet (*Sanofi Pasteur, Marcy l'Etoile, France*)

Poster 106

**'Immunological evaluation of poly[di(sodium carboxylatoethylphenoxy)phosphazene (PCEP) and avian beta defensin as adjuvants in experimental in ovo vaccine formulations against inclusion body hepatitis virus infection in chickens'**

Mishal Sarfraz, Suresh K.Tikoo, Andy Potter, Volker Gerds, Colette Wheeler and Arshud Dar (*Vaccine and Infectious Disease Organization - International Vaccine Centre, University of Saskatchewan, Saskatoon, Saskatchewan, Canada*)

Poster 107

**'Flagellin is a strong vaginal adjuvant of a therapeutic vaccine for genital cancer'**

Shee Eun Lee, Seol Hee Hong, Vivek Verma, Youn Suhk Lee, Tra-My Nu Duong, Kwangjoon Jeong, Saji Uthaman, Young Chul Sung, Jae-Tae Lee, In-Kyu Park, Jung-Joon Min and Joon Haeng Rhee (*Chonnam National University Medical School, Gwangju, Republic of Korea*)

Poster 108

**'Eyedrop vaccines in mice and ferrets induce protective immunity against viral challenges'**

Eun-Do Kim, Sangchul Yoon, Soo Jung Han and Kyoung Yul Seo (*Yonsei University, Seoul, Republic of Korea*)

Poster 109

**'CD11b+ dendritic cells in mandibular lymph nodes capture lymph borne ocular surface particulates to induce immune responses'**

Eun-Do Kim<sup>1, 4</sup>, Soonjang Lee<sup>1</sup>, Dae-Hui Kim<sup>1</sup>, Bora Lee<sup>2</sup>, Hyunsub Sim<sup>3</sup>, Keunwook Lee<sup>3</sup>, Hyun Jung Ko<sup>2</sup> and Kyoung Yul Seo<sup>1</sup> (<sup>1</sup> *Yonsei University College of Medicine, Seoul, Republic of Korea*; <sup>2</sup> *Kangwon National University, Chuncheon, Republic of Korea*; <sup>3</sup> *Hallym University, Chuncheon, Republic of Korea*; <sup>4</sup> *Brain Korea 21 Project for Medical Science, Yonsei University, Seoul, Republic of Korea*)

Poster 110

**'Evaluation of tmlT, a triple mutant of the enterotoxigenic E. coli (ETEC) heat-labile toxin, as adjuvant and antigen for intradermal delivery of a subunit vaccine against ETEC'**

Milton Maciel, Jr.<sup>1</sup>, Jacob Bitoun<sup>2</sup>, Elizabeth Norton<sup>2</sup>, Mark Smith<sup>3</sup>, William Hulse<sup>1</sup>, Glomil Corbin<sup>1</sup> and Michael Prouty<sup>1</sup> (<sup>1</sup> *Naval Medical Research Center, Silver Spring, Maryland USA*; <sup>2</sup> *Tulane University, New Orleans, Louisiana, USA*; <sup>3</sup> *Walter Reed Army Institute of Research, USA*)

Poster 111

**'Evaluating antigen-specific salivary IgA levels as an indicator of mucosal immunity following intradermal immunization with ETEC fimbrial tip adhesin CfaE plus adjuvant LT(R192G)'**

Stefanie A. Trop, William R. Hulse, Sakina Shahabudin, Chad K. Porter, Mark S. Riddle, Ramiro L. Gutierrez and Milton Maciel, Jr. (*Naval Medical Research Center, Silver Spring, Maryland, USA*)

Poster 112

**'Enhanced immunogenicity of a Campylobacter jejuni capsule conjugate vaccine utilizing army liposome formulation adjuvants'**

Christina L. Hill<sup>1</sup>, Nina M. Schumack<sup>1</sup>, Lisa A. Applebee<sup>1</sup>, Zoltan Beck<sup>2, 3</sup>, Gary R. Matyas<sup>2</sup>, Carl R. Alving<sup>2</sup>, Patricia Guerry<sup>1</sup> and Renee M. Laird<sup>1</sup> (*Naval Medical Research Center<sup>1</sup>, and U.S. Military HIV Research Program, Walter Reed Army Institute of Research<sup>2</sup>, Henry M. Jackson Foundation for the Advancement of Military Medicine<sup>3</sup>, Silver Spring, Maryland, USA*)

Poster 113

**'Steps towards the development of hepatitis E vaccine'**

Lyashenko Anna, Chumakov Alexey, Sorokin Alexey, Kyuregyan Karen, Isaeva Olga, Gordeychuk Ilya, Tukhvatullin Amir, Logunov Denis, Isagulants Maria and Mikhailov Mikhail (*Chumakov Institute of Poliomyelitis and Viral Encephalites, Moscow, Russia; Gamaleya Research Center of Epidemiology and Microbiology, Moscow, Russia*)

Poster 114

**To be confirmed**

**SESSION 4:  
VACCINES & ADJUVANTS**

Moderator: Rob Lambkin-Williams  
(hVIVO Ltd, London, UK)

09.00-09.30

**'Novel adjuvant systems for oral vaccination'**

Ed Lavelle  
(Trinity College Dublin, Dublin, Ireland)

09.30-10.00

**'New oral vaccines and adjuvants for immunization against cholera and ETEC diarrhea'**

Jan Holmgren  
(University of Gothenburg, Gothenburg, Sweden)

10.00-10.30

**'Intranasal immunization with influenza VLPs containing GPI-anchoring CCL28 induces strong responses conferring heterologous protection'**

Baozhong Wang  
(Georgia State University, Atlanta, Georgia, USA)

10.30-11.00

Coffee Break & Posters

**SESSION 5:  
VACCINES**

Moderator: Ed Lavelle  
(Trinity College Dublin, Dublin, Ireland)

11.00-11.30

**'Comparative immunogenicity in mice of DNA encoding HIV enzymes and enzyme combinations: Step towards immune control of drug resistance in HIV infection'**

Maria Issagouliantis  
(Riga Stradins University, Riga, Latvia)

11.30-12.00

**'Pre-clinical development of an oral adenovirus-based RSV vaccine'**

Anne Moore (VAXART Inc., South San Francisco, California, USA)

12.00-12.30

**'Title to be confirmed'**

Darrick Carter  
(IDRI, Seattle, Washington, USA)

12.30-14.00

Lunch Break & Posters

**SESSION 6:  
SHORT POSTER PRESENTATIONS (PART 1)**

Moderator: To be confirmed

Poster 110  
14.00-14.15

**'Evaluation of tmlT, a triple mutant of the enterotoxigenic E. coli (ETEC) heat-labile toxin, as adjuvant and antigen for intradermal delivery of a subunit vaccine against ETEC'**

Milton Maciel, Jr.<sup>1</sup>, Jacob Bitoun<sup>2</sup>, Elizabeth Norton<sup>2</sup>, Mark Smith<sup>3</sup>, William Hulsey<sup>1</sup>, Glomil Corbin<sup>1</sup> and Michael Prouty<sup>1</sup>  
(<sup>1</sup> Naval Medical Research Center, Silver Spring, Maryland USA; <sup>2</sup> Tulane University, New Orleans, Louisiana, USA; <sup>3</sup> Walter Reed Army Institute of Research, USA)

Poster 103  
14.15-14.30

**'Mannosylated chitosan: A potentially universal mucosal vaccine delivery system?'**

Anna Oblensky  
(Pacific Genetech, Oxford, UK)

Poster 111  
14.30-14.45

**'Evaluating antigen-specific salivary IgA levels as an indicator of mucosal immunity following intradermal immunization with ETEC fimbrial tip adhesin CfaE plus adjuvant LT(R192G)'**

Stefanie A. Trop, William R. Hulsey, Sakina Shahabudin, Chad K. Porter, Mark S. Riddle, Ramiro L. Gutierrez and Milton Maciel, Jr.  
(Naval Medical Research Center, Silver Spring, Maryland, USA)

Poster 112  
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**'Enhanced immunogenicity of a Campylobacter jejuni capsule conjugate vaccine utilizing army liposome formulation adjuvants'**

Christina L. Hill<sup>1</sup>, Nina M. Schumack<sup>1</sup>, Lisa A. Applebee<sup>1</sup>, Zoltan Beck<sup>2,3</sup>, Gary R. Matyas<sup>2</sup>, Carl R. Alving<sup>2</sup>, Patricia Guerry<sup>1</sup> and Renee M. Laird<sup>1</sup>  
(Naval Medical Research Center<sup>1</sup>, and U.S. Military HIV Research Program, Walter Reed Army Institute of Research<sup>2</sup>, Henry M. Jackson Foundation for the Advancement of Military Medicine<sup>3</sup>, Silver Spring, Maryland, USA)

15.00-15.30

Tea Break & Posters

**SESSION 7:  
MUCOSAL VACCINES**

Moderator: Darrick Carter  
(IDRI, Seattle, Washington, USA)

15.30-16.00

**'β-glucan microparticles targeted to epithelial APN as oral antigen delivery system'**

Kim Baert, Bruno G. de Geest, Riet de Rycke, André B. da Fonseca Antunes, Henri de Greve, Bert Devriendt and Eric Cox  
(Ghent University, Merelbeke, Belgium)

16.00-16.30

**'Thermostable subunit vaccines for pulmonary delivery: How close are we?'**

Camila Foged  
(University of Copenhagen, Copenhagen, Denmark)

16.30-17.00

**'Immunization with live nonpathogenic H5N3 duck influenza virus vaccine protects chicken against highly pathogenic H5N1 viruses'**

A.S. Gambaryan<sup>1</sup>, E.Y. Boravleva<sup>1</sup>, N.F. Lomakina<sup>1</sup>, E.A. Kropotkina<sup>1</sup>, I.V. Gordeychuk<sup>1</sup>, I.A. Chvala<sup>2</sup>, V.V. Drygin<sup>2</sup>, H.-D. Klenk<sup>3</sup> and M.N. Matrosovich<sup>3</sup>  
(<sup>1</sup> Chumakov Institute of Poliomyelitis and Viral Encephalitis, Moscow, Russia; <sup>2</sup> Federal Center for Animal Health, Vladimir, Russia; <sup>3</sup> Institute of Virology, Philipps University, Marburg, Germany)

**SESSION 8:  
ADJUVANTS**

Moderator: Ed Lavelle  
(Trinity College Dublin, Dublin, Ireland)

09.00-09.30

**'Polymer and microemulsion adjuvants enhance the immune response conferred by mucosal vaccines in mice and chicken'**

Heloise Imbault, Juliette Ben Arous, Nicolas Versillé, Sebastien Deville and Laurent Dupuis  
(SEPPIC, Paris La Défense Puteaux, France)

09.30-10.00

**'A novel adjuvanted capsule based strategy for oral vaccination against enteric bacterial pathogens'**

Stephanie Longet<sup>1</sup>, Christopher Davitt<sup>1</sup>, Edel McNeela<sup>1</sup>, Vincenzo Aversa<sup>3</sup>, Joshua Tobias<sup>2</sup>, Michael Lebens<sup>2</sup>, Monica Rosa<sup>3</sup>, Jan Holmgren<sup>2</sup>, Ivan Coulter<sup>3</sup> and Ed C. Lavelle<sup>1</sup>  
(<sup>1</sup> Trinity College Dublin, Dublin, Ireland; <sup>2</sup> University of Gothenburg, Gothenburg, Sweden; <sup>3</sup> Sigmoid Pharma Ltd, Invent Centre, Dublin City University, Dublin, Ireland)

10.00-10.20

**'Flagellin is a strong vaginal adjuvant of a therapeutic vaccine for genital cancer'**

Shee Eun Lee, Seol Hee Hong, Vivek Verma, Youn Suhk Lee, Tra-My Nu Duong, Kwangjoon Jeong, Saji Uthaman, Young Chul Sung, Jae-Tae Lee, In-Kyu Park, Jung-Joon Min and Joon Haeng Rhee  
(Chonnam National University Medical School, Gwangju, Republic of Korea)

10.20-10.50

Coffee Break & Posters

**SESSION 9:  
IMMUNOGENICITY**

Moderator: Eric Cox  
(Ghent University, Merelbeke, Belgium)

10.50-11.20

**'High immunogenicity of reverse transcriptases of HIV-1 clade A and B in intradermally gene-immunized mice'**

E. Starodubova<sup>1,2,3</sup>, S. Petkov<sup>3</sup>, J. Jansons<sup>4,5</sup>, A. Latanova<sup>2,3,6</sup>, A. Kilpelainen<sup>3</sup>, M. Krawiec<sup>3</sup>, A. Vilmane<sup>3,5</sup>, S. Sasinovich<sup>7</sup>, P. Warholm<sup>8</sup> and M. Isaguliantis<sup>3,5</sup>  
(<sup>1</sup> Chumakov Institute of Poliomyelitis and Viral Encephalitis, Moscow, Russia; <sup>2</sup> WA Engelhardt Institute of Molecular Biology, Moscow, Russia; <sup>3</sup> Department of Microbiology, Tumor and Cell Biology, Karolinska Institutet, Stockholm, Sweden; <sup>4</sup> Biomedical Research and Study Center, Riga, Latvia; <sup>5</sup> Riga Stradins University, Riga, Latvia; <sup>6</sup> Gamaleja Research Center of Epidemiology and Microbiology, Moscow, Russia; <sup>7</sup> The Republican Research and Practical Centre for Epidemiology and Microbiology, Minsk, Belarus; <sup>8</sup> Science for Life Laboratory, Stockholm University, Stockholm, Sweden)

11.20-11.50

**'Microbiota-regulated, natural IgA confers protection against oral enterotoxin challenge'**

Craig McEntee, Rachel M. McLoughlin and Ed C. Lavelle  
(Trinity College Dublin, Dublin, Ireland)

11.50-12.20

**'Near infra-red fluorescent protein iRFP670 as an *in vivo* imaging reporter for delivery and immunogenic performance of naked DNA vaccines'**

Juris Janssons<sup>2</sup>, S. Petkov<sup>1,2</sup>, J. Jansons<sup>3</sup>, D. Skrastina<sup>3</sup>, M. Abakumov<sup>4</sup>, I. Gordeychuk<sup>5</sup>, A. Latanova<sup>1,6</sup>, A. Dovbenko<sup>3</sup>, A. Strods<sup>3</sup>, M. Kalis<sup>2</sup>, Y. Moriizumi<sup>7</sup>, P. Bankovsky<sup>8</sup>, V. Verkhusha<sup>9</sup> and M. Isaguliantis<sup>1,2</sup>  
(<sup>1</sup> Karolinska Institutet, Stockholm, Sweden; <sup>2</sup> Riga Stradins University, Riga,

Latvia; <sup>3</sup> Latvian Biomedical Research and Study Center, Riga, Latvia; <sup>4</sup> Pirogov Russian National Research Medical University, Moscow, Russia; <sup>5</sup> Chumakov Institute of Poliomyelitis and Viral Encephalitis, Moscow, Russia; <sup>6</sup> Gamaleja Research Center of Epidemiology and Microbiology, Moscow, Russia; <sup>7</sup> BEX Co., Ltd, Tokyo, Japan; <sup>8</sup> Bioscience Media, Riga, Latvia; <sup>9</sup> Department of Anatomy and Structural Biology, Albert Einstein College of Medicine, Bronx, New York, USA)

12.20-13.30

Lunch Break & Posters Breakdown

**SESSION 10:  
SHORT POSTER PRESENTATIONS (PART 2)**

Moderator: Richard Walker (PATH, Washington, USA)

Poster 101

13.30-13.45

**'Seminal plasma exposures strengthen vaccine responses in the female reproductive tract mucosae'**

Romain Marlin<sup>1,2,3</sup>, Marie-Thérèse Nugeyre<sup>1,2,3</sup>, Matteo Parenti<sup>1</sup>, Nathalie Dereuddre-Bosquet<sup>1</sup>, Françoise Barré-Sinoussi<sup>3,4</sup>, Gabriella Scarlatti<sup>3,5</sup>, Roger Le Grand<sup>1,3</sup> and Elisabeth Menu<sup>1,2,3</sup>  
(<sup>1</sup> Université Paris Sud, Inserm U 1184, Fontenay-Aux-Roses, France; <sup>2</sup> MISTIC Group, Institut Pasteur, Paris, France; <sup>3</sup> Vaccine Research Institute, Créteil, France; <sup>4</sup> Institut Pasteur, Paris, France; <sup>5</sup> San Raffaele Scientific Institute, Milan, Italy)

Poster 102

13.45-14.00

**'Advax, a mucosal adjuvant for whole inactivated influenza virus vaccine'**

Jasmine Tomar<sup>1</sup>, H.P. Patil<sup>2</sup>, W.F. Tonniss<sup>1</sup>, R. Vanbever<sup>2</sup>, N. Petrovsky<sup>3</sup>, A. Huckriede<sup>4</sup>, H.W. Frijlink<sup>1</sup> and W.L.J. Hinrichs<sup>1</sup>  
(<sup>1</sup> University of Groningen, Groningen, The Netherlands; <sup>2</sup> Université Catholique de Louvain, Brussels, Belgium; <sup>3</sup> Vaxine Pty Ltd, Flinders Medical Center, Adelaide, Australia; <sup>4</sup> University Medical Center Groningen, Groningen, The Netherlands)

Poster 104

14.00-14.15

**'High cellular immunogenicity in mice of a prototype multicomponent DNA vaccine based on HIV-1 clade A enzymes'**

Latanova Anastasia<sup>1,2,3</sup>, Petkov Stefan<sup>3</sup>, Athina Kilpeläinen<sup>3</sup>, Juris Jansons<sup>4</sup>, Olga Krotova<sup>1</sup>, Anda Vilmane<sup>4</sup>, Starodubova Elizaveta<sup>2,3,5</sup> and Isaguliantis Maria<sup>1,3,4,5</sup>  
(<sup>1</sup> NF Gamaleja Research Center of Epidemiology and Microbiology, Moscow, Russia; <sup>2</sup> Engelhardt Institute of Molecular Biology, Moscow, Russia; <sup>3</sup> Department of Microbiology, Tumor and Cell Biology, Karolinska Institutet, Stockholm, Sweden; <sup>4</sup> Riga Stradins University, Riga, Latvia; <sup>5</sup> MP Chumakov Institute of Poliomyelitis and Viral Encephalitis, Moscow, Russia)

Poster 106

14.15-14.30

**'Immunological evaluation of poly[di(sodium carboxylatoethylphenoxy) phosphazene (PCEP) and avian beta defensin as adjuvants in experimental *in ovo* vaccine formulations against inclusion body hepatitis virus infection in chickens'**

Mishal Sarfraz, Suresh K.Tikoo, Andy Potter, Volker Gerdts, Colette Wheler and Arshud Dar  
(Vaccine and Infectious Disease Organization – International Vaccine Centre, University of Saskatchewan, Saskatoon, Saskatchewan, Canada)

14.30-14.40

**Closing Remarks & Departure**

Richard Walker  
(PATH, Washington DC, USA)

\* 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.