

14th International Colloquium on Paratuberculosis (ICP 2018)

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TUESDAY JUNE 5th

Session 1. Diagnostic, Immunology and Host Response

8:45-9:30 Lecture. Dr. Claus D Buergelt (U.S.A.): **“ASPECTS OF PATHOLOGY AND PATHOGENESIS OF DOMESTIC RUMINANT PARATUBERCULOSIS”**. 27

9:30-9:45 Coffee break

Moderators: Victoria E. Castrellón Ahumada & Miguel Salgado

1st Oral Session. Moderators: Marta Alonso-Hearn & Frank Griffin (9:30-12:45)

9:45-10:00 **1.1 LIMITED ADAPTIVE IMMUNE RESPONSES OF GOAT KIDS TO MAP BACTERIN VACCINATION WHEN RAISED IN A MYCOBACTERIUM AVIUM SSP PARATUBERCULOSIS (MAP) FREE ENVIRONMENT**. Ad Koets¹, Lars Ravesloot¹, Robin Ruuls¹, Annemieke Dinkla¹, Karianne Lievaart-Peterson². 30

¹ Wageningen Bioveterinary Research, Lelystad, The Netherlands

² GD Animal Health, Deventer, The Netherlands

10:00-10:15 **1.2 FAILURE TO DETECT M. AVIUM SUBSPECIES PARATUBERCULOSIS BY FLUORESCENT IN SITU HYBRIDIZATION (FISH) IN JOHNE'S OR CROHN'S DISEASE USING A PROPRIETARY ASSAY**. Robert Greenstein¹, Liya Su¹, Peter Fam¹, Judith Stabel², Sheldon Brown¹. 31

¹JJP Veteran Affairs Medical Center Bronx NY USA

²USDA-ARS-NADC Ames Iowa USA

10:15-10:30 **1.3 DIVERSE HISTOPATHOLOGICAL AND MICROBIOLOGICAL FINDINGS IN EXPERIMENTAL MYCOBACTERIUM AVIUM SUBSPECIES PARATUBERCULOSIS INFECTION IN CATTLE**. Richard Whittington¹, Douglas Begg¹, Karren Plain¹, Kumudika de Silva¹, Ratna Gurung¹, Alison Gunn¹, Auriol Purdie¹. 32

¹ The University of Sydney

10:30-10:45 **1.4 PREDICTION OF THE GENETIC SUSCEPTIBILITY TO PARATUBERCULOSIS IN DAIRY CATTLE USING ALLELIC COMBINATIONS OF FIVE SINGLE NUCLEOTIDE POLYMORPHISMS IN CD209, SLC11A1, SP110, AND TLR2 GENES**. María Canive¹, Rosa Casais², Patricia Vázquez¹, Ana Balseiro², José M. Prieto², Javier Amado³, José A. Jiménez⁴, Joseba Garrido¹, Ramón A. Juste^{1,5}, Marta Alonso-Hearn¹. 33

¹NEIKER- Instituto Vasco de Investigación y Desarrollo Agrario, Animal Health Department, Derio, Bizkaia, Spain

²SERIDA, Servicio Regional de Investigación y Desarrollo Agroalimentario. Centro de Biotecnología, Deva, Asturias, Spain

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⁴CONAFE, Spanish Federation of Holstein Cattle, Madrid, Spain

⁵SERIDA, Regional Service of Agri-Food Research and Development, Villaviciosa, Asturias, Spain

10:45-11:00 **1.5 EARLY DIAGNOSIS OF PARATUBERCULOSIS INFECTION USING ELISAS BASED ON THE DETECTION OF HOST BIOMARKERS.** Rosa Casais¹, Cristina Blanco¹, Ana Balseiro¹, Ramón Antonio Juste¹, Begoña Menendez¹, José Miguel Prieto¹, Rosana Torremocha³, Beatriz Soriano⁴, Ricardo Ramos³, Carlos Llorens⁴, Francisca Copano⁵, Javier Amado⁵, Maria Canive⁶, Marta Alonso⁶ 34

¹SERIDA, Servicio Regional de Investigación y Desarrollo Agroalimentario. Centro de Biotecnología Animal, Deva, Asturias, Spain

²SERIDA, Regional Service of Agri-Food Research and Development, Villaviciosa, Asturias, Spain

³Parque Científico de Madrid, Unidad de Genómica, Campus de Cantoblanco, Madrid

⁴Biotechvana, Paterna, Valencia, Spain

⁵LSAPA, Animal Health Laboratory of the Principality of Asturias. Departament of Microbiology, Gijón, Asturias, Spain

⁶NEIKER- Instituto Vasco de Investigación y Desarrollo Agrario, Animal Health Department, Derio, Bizkaia, Spain

11:00-11:15 **1.6 CHARACTERIZING RESPONSES OF IMMUNE CELL SUBSETS FROM M. PARATUBERCULOSIS (MAP) TEST POSITIVE AND TEST NEGATIVE COWS FROM COMMERCIAL HERDS TO MAP ANTIGEN STIMULATION IN VITRO.** Paul Coussens, Meredith C. Frie 35

11:15-11:30 **1.7 COMPARISON OF SHEEP, GOATS, AND CALVES AS INFECTION MODELS FOR MYCOBACTERIUM AVIUM SUBSP. PARATUBERCULOSIS.** Judith Stabel¹, John P. Bannantine¹, Jesse M. Hostetter². 36

¹USDA-ARS-National Animal Disease Center

²Iowa State University

11:30-11:45 **1.8 LDLR FACILITATES MYCOBACTERIAL INFECTION-INDUCED CHANGES TO HOST LIPID METABOLISM.** Matt D. Johansen¹, Auriol C. Purdie¹, Kumudika de Silva¹, Karren M. Plain¹, Stefan H. Oehlers². 37

¹University of Sydney

²Centenary Institute

11:45-12:00 **1.9 EFFECTS OF VACCINATION ROUTE ON THE IMMUNE RESPONSE IN THE RABBIT PARATUBERCULOSIS INFECTION MODEL.** Iraia Ladero¹, Raket Arrazuria¹, Elena Molina¹, Miguel Fernández², Marcos Royo², Joseba Garrido¹, Ramón Juste¹, Valentín Pérez², **Natalia Elguezabal¹**. 38

¹NEIKER-Instituto Vasco de Investigación y Desarrollo Agrario, Animal Health Department, Derio, Bizkaia, Spain

²Departamento de Sanidad Animal, Instituto de Ganadería de Montaña (CSIC-Universidad de León), Facultad de Veterinaria, C/ Profesor Pedro Cármenes s/n, 24071 León

- 12:00-12:15 **1.10 CYTOKINE GENE EXPRESSION PROFILES IN THE BLOOD OF CLINICAL AND NON-CLINICAL SHEEP AND GOATS INFECTED WITH MYCOBACTERIUM AVIUM SUBSPECIES PARATUBERCULOSIS.** Ganesh Gangaram Sonawane¹, Bhupendra Nath Tripathi¹, L.L.L. Prince², Rajendra Kumar Meena¹. 39
 1 ICAR-National Research Centre on Equines, Hisar-125001(Haryana), India
 2 ICAR - Directorate of Poultry Research, Rajendranagar, Hyderabad 500 030 (Telangana), India
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 Frank Griffin¹, Rory O'Brien¹, Simon Liggett¹, Andrew Bates².
 1 Disease Research Limited, Invermay Agricultural Centre, Mosgiel, New Zealand
 2 Vetlife, Centre for Dairy Excellence, Geraldine, New Zealand
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¹Animal Health Division, Central Institute for Research on Goats, Makhdoom, PO- Farah, Mathura, UP, India
²Department of Life Sciences and Biotechnology, South Asian University, New Delhi, India
³Department of Epidemiology and Preventive Medicine, College of Veterinary Science and Animal Husbandry, GADVASU, Ludhiana, Punjab, India
⁴Department of Epidemiology and Preventive Medicine, College of Veterinary Science and Animal Husbandry, OUAT, Bhubaneswar, Odisha, India
- 13:00-14:45 Lunch time.
- 2nd Oral Session. Moderators: Natalia Elguezabal & David Kelton (14:45-16:00)**
- 14:45-15:00 **1.13 IMMUNE RESPONSE INDUCED BY A LOCAL STRAIN OF MYCOBACTERIUM AVIUM SUBSP. PARATUBERCULOSIS IN ANIMAL MODELS.** María Alejandra Colombatti Olivieri¹, Roberto Damian Moyano¹, María José Gravisaco¹, Gabriel Eduardo Traveria², María de la Paz Santangelo¹, María Isabel Romano¹. 42
¹Instituto de Biotecnología, INTA Castelar, Buenos Aires, Argentina
²Centro de Diagnostico e Investigaciones Veterinarias (CEDIVE) de la Facultad de Ciencias Veterinarias, Universidad de La Plata, Buenos Aires, Argentina
- 15:00-15:15 **1.14 MAP-SPECIFIC VOLATILE ORGANIC COMPOUND PROFILE: A COMPARATIVE ANALYSIS OF THREE DIFFERENT IN VITRO STUDIES.** Anne Küntzel¹, Sina Fischer¹, Andreas Bergman², Peter Oertel², Philip Trefz², Wolfram Miekisch², Jochen Schubert², Petra Reinhold¹, Heike Köhler¹. 43
¹Friedrich-Loeffler-Institut, Institute of Molecular Pathogenesis, Germany
²University of Rostock, Department of Anesthesia and Intensive Care, Germany

<p>15:15-15:30 1.15 EX VIVO VACCINATION WITH A PLGA/MPLA NANOPARTICLE VECTORED A 35 KDA MAJOR MEMBRANE PROTEIN FROM MYCOBACTERIUM AVIUM PARATUBERCULOSIS ELICITS KILLING OF INTRACELLULAR BACTERIA BY CD8 T CELLS. Cleverson D Souza¹, Gaber S. Abdellrazeq¹, Mahammoud M. Elnaggar², John P. Bannantine³, Julianne Hwang⁴, William C. Davis². ¹Washington State University, Faculty Veterinary Medicine, Alexandria University, Egypt ²Vet Micro/Pathol, Washington State University, Pullman, WA, U.S., Faculty Veterinary Medicine, Alexandria University, Egypt ³National Animal Disease Center, USDA-Agricultural Research Service, Ames, US ⁴Veterinary Clinical Sciences, Washington State University, Pullman, US</p>	44
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WEDNESDAY JUNE 6th

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- Moderators: Victoria E. Castrellón Ahumada & Miguel Salgado**
- 1st Oral Session. Moderators: Judy Stabel & Joseba Garrido (8:45-10:45)**
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¹Institute of Molecular Pathogenesis, Friedrich-Loeffler-Institut, Jena.
- 9:00- 9:15 **2.2 BREEDING FOR RESISTANCE AGAINST PARATUBERCULOSIS: HIGH GENETIC CORRELATION BETWEEN ANTIBODY RESPONSE AND FAECAL SHEDDING.** Lydia C.M. de Haer², Gerben de Jong¹, Maarten F. Weber². 95
¹CRV Arnhem, the Netherlands
²GD Animal Health, Deventer, the Netherlands.
- 9:15- 9:30 **2.3 ECONOMIC IMPACT OF CONTROL OPTIONS FOR JOHNE’S DISEASE IN CANADA.** Philip Rasmussen¹, Zhaoxue Ci¹, David Hall¹. 96
¹University of Calgary.
- 9:30-9:45 **2.4 AN EFFECTIVE CONTROL PROGRAM USING A POOLED FAECAL REAL-TIME PCR ASSAY IN HERDS WITH JOHNE’S DISEASE.** Satoko Kawaji¹, Reiko Nagata¹, Akiko Mita², Makoto Osaki¹, Yasuyuki Mori¹. 97
¹National Institute of Animal Health, NARO
²National Livestock Breeding Center
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¹Park Vet Group
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¹Amity Institute of Microbial Technology, Amity University Rajasthan, Jaipur, India.
²Microbiology Laboratory, Central Institute for Research on Goats, Mathura, India
³Amity Center for Mycobacterial Disease Research, Amity University Rajasthan, Jaipur, India
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¹University of Wisconsin-Madison.
²Iowa State University

10:30-10:45 **2.8 MYCOBACTERIUM AVIUM SSP. PARATUBERCULOSIS (MAP) MOLECULAR DIVERSITY IN LATIN AMERICA AND THE CARIBBEAN: A SYSTEMATIC REVIEW.** Nathalia M Correa-Valencia¹, Miguel Hernández-Agudelo¹, Jorge A Fernández-Silva¹. 101

¹Centauro, Escuela de Medicina Veterinaria, Facultad de Ciencias Agrarias, Universidad de Antioquia, Colombia

10:45-11:00 Coffee break

2nd Oral Session. Moderators: Vivek Kapur & Nicola Pozzato (11:00-12:15)

11:00 -11:15 **2.9 PHYLOGENETIC ANALYSIS AND EPIDEMIOLOGIC MODELING OF THE EFFECT OF MYCOBACTERIUM AVIUM SUBSP. PARATUBERCULOSIS GENOTYPE ON MILK PRODUCTION ON THREE MINNESOTA DAIRY FARMS.** Jonah Cullen¹, Yuanyuan Wang¹, Juan Abrahante¹, Fernanda Shoyama², Srinand Sreevatsan², Scott Wells¹ 102

¹University of Minnesota.

²Michigan State University

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¹Neiker-Instituto Vasco de Investigación y Desarrollo Agrario. Departamento de Sanidad Animal, Derio, Bizkaia, Spain.

²Serida, Servicio Regional de Investigación y Desarrollo Agroalimentario de Asturias, Villaviciosa, Asturias, Spain.

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¹University of Minnesota, Twin Cities

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²SaBio, Instituto de Investigación en Recursos Cinegéticos IREC (CSIC-UCLM-JCCM), Ciudad Real, Spain.

³Department of Animal Health, Faculty of Veterinary Medicine, University of León, Spain

12:00 – 12:15 **2.13 PRACTICAL EXPERIENCES IN DELIVERING A COMMERCIALY DRIVEN NATIONAL JD PROGRAM IN THE UNITED KINGDOM.** Pete Orpin¹, Richard Sibley¹. 106

¹Westridge Veterinary Group

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14:00– 15:00 Lunch

15:00 Afternoon Free

THURSDAY. JUNE 7th

Session 3. Pathogenomics and Map biology.

8:00- 10:10 Foro Iberoamericano (By invitation)

10:30-11:15 **Lecture. Dr Jeroen De Buck (Canada): “RECENT DEVELOPMENTS IN PATHOGENOMICS TO UNDERSTAND MAP (*MYCOBACTERIUM AVIUM* SUBSP. *PARATUBERCULOSIS*) PATHOGENESIS AND DIAGNOSE JOHNE'S DISEASE”.** 128

11:15-11:30 Coffee break

Moderators: Victoria E. Castrellón Ahumada & Miguel Salgado

Oral Session. Moderators: Karen Stevenson & Adel Talaat (11:30-13:00)

11:30- 11:45 **3.1 ON THE USE OF WHOLE GENOME SEQUENCING TO UNVEIL LOCAL SPREAD OF A PARATUBERCULOSIS CLONE WITHIN A SINGLE HERD.** Matteo Ricchi¹, Simone Russo¹, Erika Scaltriti², Simone Leo¹, Luca Bolzoni², Norma Arrigoni¹ 131

¹Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna, National Reference Centre for paratuberculosis, Strada Faggiola 1, Podenzano (PC), Italy.

²Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna, Risk Analysis Unit, Via dei Mercati 13/A, Parma 43126, Italy.

11:45- 12:00 **3.2 EVALUATION OF A MAP MUTANT IN BOVINE BMDM AND IN A MOUSE MODEL, AND NEW METHODS FOR M. AVIUM SUBSPECIE PARATUBERCULOSIS MUTAGENESIS.** María de la Paz Santangelo¹, Mariana Viale¹, Alejandra Colombatti¹, Natalia Alonso¹, William Davis², María Isabel Romano¹. 132

¹Instituto de Biotecnología, INTA. Buenos Aires, Argentina. CONICET

²Department of Veterinary Microbiology and Pathology, College of Veterinary Medicine, Washington State University, Pullman, WA 99164, USA

12:00-12:15 **3.3 MYCOBACTERIUM AVIUM SUBSP. PARATUBERCULOSIS: IN VITRO INTERACTION WITH AND BOVINE SPERM CELLS.** Isis Espeschit¹, Ana Carolina Silva Faria¹, Daniel Mendonça de Araújo Lima¹, Breno Soares Camilo¹, David Germano Gonçalves Schwars¹, Mariana Barros¹, Sanelly Lourenço da Costa¹, Maria Aparecida Scatamburlo Moreira¹. 133

¹Universidade Federal de Viçosa.

12:15-12:30 **3.4 ASSESSMENT OF MYCOBACTERIUM AVIUM SUBSP. PARATUBERCULOSIS VIABILITY USING FLOW CYTOMETRY.** Timothy Scott¹, Marina Buciu¹. 134

¹Minnesota State University, Mankato

12:30-12:45 **3.5 TRANSCRIPTOME ANALYSIS OF ILEUM TISSUES FROM MYCOBACTERIUM AVIUM SSP. PARATUBERCULOSIS INFECTED COWS REVEALS IMPORTANT GENES AND PATHWAYS FOR JOHNE'S DISEASE.** 135

Nathalie Bissonnette¹, Duy N. Do¹, Pier-Luc Dudemaine², Eveline M. Ibeagha-Awemu¹.

¹Agriculture and Agri-Food Canada, Sherbrooke Research and Development Centre, Sherbrooke, Qc, Canada

²Agriculture and Agri-Food Canada, Sherbrooke Research and Development Centre, Sherbrooke, Department of Animal Science, McGill University, Qc, Canada.

12:45-13:00 **3.6 HOST GENE EXPRESSION SIGNATURE OF IMMUNE-REGULATORY GENES IN WHOLE BLOOD OF CATTLE WITH SUBCLINICAL INFECTION OF MYCOBACTERIUM AVIUM SUBSP. PARATUBERCULOSIS.** 136

Han Sang Yoo¹, Hyun-Eui Park¹, Hongtae Park¹, Young Hoon Jung².

¹Department of Infectious Diseases, College of Veterinary Medicine, Seoul National University, Korea.

²Department of Animal Resources Development, National Institute of Animal Science, Rural Development Administration, Korea

13:00-14:30 Lunch time

14:30-15:15 **Lecture. Ramón A. Juste Jordan (Spain): "Chronic regional intestinal inflammatory disease: A walk through the species".** 130

15:15-15:30 Coffee break

15:30- 16:10 "Richard S. Merkal Award"

Moderator: Scott Wells

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¹University of Calgary

PREVALENCE OF MYCOBACTERIUM AVIUM SUBSP. PARATUBERCULOSIS ACROSS CANADA, BASED ON ENVIRONMENTAL SAMPLING. Caroline S. Corbett¹, S. Ali Naqvi¹, Cathy Bauman², Jeroen De Buck¹, Karin Orsel¹, David F. Kelton², Herman W. Barkema. 157

¹University of Calgary

²University of Guelph

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17:00-18:00 General Meeting

18:00-18:15 Group Photography

FRIDAY JUNE 8th

Session 4. Public Health and Map Environment.

8:00- 8:45 Lecture. Dr. Rodrick Chiodini (USA): “Crohn’s Disease and Johne’s disease: Why everyone doesn’t believe you” 143

Moderators: Victoria E. Castrellón Ahumada & Miguel Salgado

Oral Session. Moderators: Tim Bull & Robert Greenstein (8:45-10:00)

8:45-9:00 **4.1. NOVEL NANO-IMMUNO-TEST FOR THE DETECTION OF LIVE PARATB BACILLI IN THE MILK OF DOMESTIC LIVESTOCK.** Shoor Vir Singh¹, Manju Singh¹, Bjorn John Stephan², Manali Dutta², Gajendra Kumar Aseri², Jagdip Singh Sohal². 144

¹Animal Health Division, Central Institute for Research on Goats, Makhdoom, PO-Farah- 281 122, Dist. - Mathura, Uttar Pradesh, India.

²AIMT & AIB, Amity University Rajasthan, Jaipur, India.

9:00-9:15 **4.2 ESTIMATION OF PERFORMANCE CHARACTERISTICS OF ANALYTICAL METHODS FOR MYCOBACTERIUM AVIUM PARATUBERCULOSIS (MAP) DETECTION IN MILK.** Butot Sophie, Ricchi Matteo¹, Sevilla Iker², Michot Lise³, Molina Elena², Tello Maitane², Russo Simone¹, Tomas David³. 145

¹IZSLER

²NEIKER

³Nestlé Research Center

9:15- 9:30 **4.3 EFFECT OF CALCIUM HYDROGEN CARBONATE MESOSCOPIC CRYSTALS TO MYCOBACTERIUM AVIUM SUBSP. PARATUBERCULOSIS.** Eiichi Momotani, Rumiko Onishi, Koichi Furusaki, Takashi Onodera 146

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¹University of Poitiers

²INRA Nouzilly

9:45-10:00 **4.5 MYCOBACTERIUM AVIUM SUBSPECIES PARATUBERCULOSIS AND MYELIN BASIC PROTEIN SPECIFIC EPITOPES ARE HIGHLY RECOGNIZED BY SERA FROM PATIENTS WITH NEUROMYELITIS OPTICA SPECTRUM DISORDER.** Marco Bo¹, Giannina Arru¹, Magdalena Niegowska², Gianpietro Sehi¹, Leonardo Sechi². 148

¹Department of Clinical and Experimental Medicine, University of Sassari, Italy.

²Department of Biomedical Sciences, University of Sassari, Sassari, Viale San Pietro 43b, Italy

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11:15-12:15 Synopsis of the Colloquium, next 15th ICP.