

# **The Paratuberculosis Newsletter**

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### DEADLINE FOR NEXT ISSUE: 15 February 2013

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Søren Saxmose Nielsen  
Editor

## **1. IAP Business**

### ***12<sup>th</sup> International Colloquium on Paratuberculosis***

The 12th International Colloquium on Paratuberculosis will take place in Parma 22-26 June 2014. Visit the official website at: <http://www.icp2014.eu/>



### ***IAP Book Purchases***

The association has a number of past International Colloquium proceedings available for distribution. We currently have the following in stock:

- 8ICP Proceedings – Book
- 8ICP Proceedings – CD-ROM
- 7ICP Proceedings – Book
- 6ICP Proceedings – Book
- 5ICP Proceedings – Book
- 4ICP Proceedings – Book

Proceedings are available FREE to members, but shipping charges of \$15 (USA) or \$35 (outside of USA) will apply. Non-members may purchase the Proceedings for \$25 plus shipping costs.

Furthermore,

The History of Paratuberculosis compiled by Rod Chiodini is available for 50 USD + shipping for members, and \$125 +shipping for non-members.

To order please send an e-mail to Secretary-Treasurer Ray Sweeney at:  
[rsweeney@vet.upenn.edu](mailto:rsweeney@vet.upenn.edu)

and include the following information:

- Item and no. of each
- Shipping address
- Preferred method of payment
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The number of proceedings is limited so we operate by first-come-first-served principle. Please place your order no later than 1 April 2012.

Also note that the 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup>, 10<sup>th</sup>, and 11<sup>th</sup> Proceedings are available on-line at [www.paratuberculosis.info](http://www.paratuberculosis.info).

Starting with the 9<sup>th</sup> ICP, a print version of the Proceedings are no longer produced by IAP. However, print versions of 9<sup>th</sup>, 10<sup>th</sup>, and 11<sup>th</sup> ICP can be purchased at <http://www.proceedings.com/6219.html>

## 2. Comments and Opinions

### **Infectious Diseases Incorporated FUIDI Premises**

Gilles R. G. Monif, M.D.

#### *Infectious Diseases Incorporated*

Premises are hypotheses awaiting scientific confirmation.

*Mycobacterium avium* subspecies *paratuberculosis* (Map) is a mycobacterium that is embedded in the food supply of herbivores. In cattle, it infects the gastrointestinal tract and induces transient or chronic enteritis. Using 1990's statistics, Map had an estimated 1.2 billion dollar adverse impact on producers (due to decreased milk and fat production, decreased slaughter weight, reproductive losses, and early replacement of productive animals). Despite the acknowledged economic losses to the dairy industry, producers have been reluctant to address the issue owing to Map's presence in unpasteurized milk and what is deemed a possible causal relationship between Map and Crohn's disease in humans. USDA initiated a subsidized Map testing on a voluntary basis. To participate in the program, a producer would have had to pay a small portion of the cost plus potentially exposed unfavorable data about his or her herd.

Since 2008, Map has been recognized as a zoonotic pathogen for man. Map or its DNA has been demonstrated primarily in diseased tissue from individuals with inflammatory bowel disease. Similarly, Map has been demonstrated to be in the blood and breast milk of predominantly individuals with Crohn's disease. Governments have been reluctant to respond to the "Map dilemma", given the importance of milk and milk-based products to the national economies.

In 2002, Infectious Diseases Incorporated (IDI) began work on its patented FUIDI Herd Management Schema (FHMS). FHMS is a system that allows infected animals to remain in production yet reduces the amount of Map entering the human food supply through milk and milk-related products.

#### *Mycobacterium avium* subspecies *paratuberculosis* (Map) and genomic variants

1. Map is present in soil.
2. Map becomes embedded in the food supply of herbivores.
3. Map evolved from *Mycobacterium avium* subspecies *avium* (Ma) or possibly *Mycobacterium hominissuis*.
4. Between Ma and Map polymorphic variants exist that can cause chronic enteritis in animals.
5. The older a pathogenic mycobacterium is phylogenically, the less virulence is the species.
6. Map is A cause of chronic enteritis in herbivores and other animals, but not THE sole cause of disease.
7. Pathogenicity varies among Map isolates.
8. Species virulence among pathogenic mycobacterium can be enhanced by current herd management practices that embed and disseminate into the production area

environment isolates that have been selected to be effective pathogens for the host species in question.

9. Once introduced into the pasture or production environment, total elimination is at best very difficult.
10. Infected animals are not the ultimate reservoir for Map.
11. Map has the potential to be a zoonotic pathogen for humans.
12. Not all Map isolates are detected by IS900 direct primers.
13. Current commercial MAP ELISA tests do not identify all pathogenic mycobacterium that produce enteric disease in herbivores.

#### *Mycobacterium avium* subspecies *paratuberculosis* (Map) and Johne's Disease

1. Map is A cause of Johne's disease.
2. Host susceptibility is inversely related to age (as in humans).
3. Map herbivore infection can occur due to organism acquisition by transplacental transmission, in the newborn period, and in adult life (intra-herd dissemination).
4. The theorized three stage pathogenesis of Map infection cannot with stand scientific challenge.
5. IDI's construction of the natural history of Map infection is foundation for the FUIDI Herd Management Schema.
6. Host containment of Map can be overwhelmed by a combination of factors that alters its immune status.
7. USDA's policy of containing Johne's disease by testing animal and culling animals with advanced infection reduces the incidence of Johne's disease, but does not reduce the prevalence of herd infection.
8. USDA commercially sanctioned Map ELISA tests identify but a limited number of infected animals.
9. Fecal culture is a too insensitive test to anchor epidemiologic studies
10. The "gold standard" for assessing Map infection is PCR analysis of mesenteric and ileocecal lymph nodes.
11. The concept of "pass-through" technically and conceptionally is flawed.
12. Epidemiologic studies predicated upon Map fecal culture and the approved commercial Map ELISA tests are flawed in their foundation premises and are responsible for the current state of confusion concerning Map.
13. The use of confined production areas selects for propagation of the more virulent subgroup of Map.
14. Milk is one of the primary vehicles which expose humans to Map in significant numbers.
15. The virulence of Map isolates in milk are theorized to be greater than Map isolate found in the wild or water not exposed to domesticated herbivores.
16. Because of its replication in clumps, the use of the quantity of Map in a given fecal sample introduces the potential for significant sample and interpretation errors.

#### *Mycobacterium avium* subspecies *paratuberculosis* (Map) and Crohn's Disease

1. Directly or indirectly, Map is a zoonotic pathogen for human beings.

2. Map and related mycobacterium cause a spectrum of gastrointestinal conditions that include asymptomatic infections, an increase in bowel movements, irritable bowel syndrome, and inflammatory bowel disease.
3. Article 5.7 of the World Trade Organization's Agreement on Sanitary and Phytosanitary Measures and Principle 15 of the United Nations' Rio Declaration on Food Safety render the debate of direct vs. indirect ethically untenable .
4. Map initiates the production of tumor necrosis factor that is primarily responsible for gastrointestinal tissue damage.
5. Human beings will be perpetually exposed to Map.
6. Selected groups are genetically predisposed to developing inflammatory bowel disease.
7. Specific preventive step are required to protect the most vulnerable human beings (babies and children) without a genetic predisposition.
8. Voluntary monitoring programs without consequences and defined benefits will not work.

To create the FHMS, IDI had to free itself from the prevailing opinions/published literature and develop a number of independent sets of premises from its analysis of relevant observations and from its own research in order to formulate the foundation blocks for the FHMS.

### **Appointment**

A. K. Singh

There is great news that Dr B.N. Tripathi, Principal Scientist and Head Animal Health Division is going to join as Director of C. C. S. National Institute of Animal Health under the Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India. Letter from Government of India has appointed Dr. Tripathi seeing his valuable services to the Indian farmers. Dr. Tripathi is actively working on the Paratuberculosis since last 20 years.

### **3. List of Recent Publications**

- Arsenault RJ, Li Y, Maattanen P, Scruten E, Doig K, Potter A, Griebel P, Kusalik A, Napper S. [Altered Toll-Like Receptor 9 signaling in \*Mycobacterium avium\* subsp. \*paratuberculosis\* infected bovine monocytes reveals potential therapeutic targets](#). Infect Immun. 2012 Oct 31. [Epub ahead of print]
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- Byun EH, Kim WS, Kim JS, Won CJ, Choi HG, Kim HJ, Cho SN, Lee K, Zhang T, Hur GM, Shin SJ. [Mycobacterium paratuberculosis CobT activates dendritic cells via engagement of Toll-like Receptor 4 resulting in Th1 cell expansion](#). J Biol Chem. 287:38609-24.
- Carvalho IA, Pietralonga PA, Schwarz DG, Faria AC, Moreira MA. [Short communication: Recovery of viable \*Mycobacterium avium\* subspecies \*paratuberculosis\* from retail pasteurized whole milk in Brazil](#). J Dairy Sci. 95:6946-8.
- Chandra S, Faisal SM, Chen JW, Chen TT, McDonough SP, Liu S, Moreira MA, Akey BL, Chang CF, Chang YF. [Immune response and protective efficacy of live attenuated \*Salmonella\* vaccine expressing antigens of \*Mycobacterium avium\* subsp. \*paratuberculosis\* against challenge in mice](#). Vaccine. 2012 Sep 20. [Epub ahead of print]
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- Dungan RS, Klein M, Leytem AB. [Quantification of bacterial indicators and zoonotic pathogens in dairy wastewater ponds](#). Appl Environ Microbiol. 78:8089-95.
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- Gilardoni LR, Paolicchi FA, Mundo SL. [Bovine paratuberculosis: a review of the advantages and disadvantages of different diagnostic tests](#). Rev Argent Microbiol. 44:201-215.
- Gioffré A, Echeverría-Valencia G, Zumárraga M, Morsella C, Mon ML, Viale M, Paolicchi F, Romano MI. [Production and evaluation of a purified protein derivative from an Argentine strain of \*Mycobacterium avium\* subsp. \*paratuberculosis\*](#). Rev Argent Microbiol.44:155-64. Spanish.



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- Kawaji S, Nagata R, Whittington RJ, Mori Y. [Detection of antibody responses against \*Mycobacterium avium\* subsp. \*paratuberculosis\* stress-associated proteins within 30 weeks after infection in cattle.](#) Vet Immunol Immunopathol. 150:101-11.
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