

The Paratuberculosis Newsletter

Issue 3: October 2021

The official publication of the International Association for Paratuberculosis



Venue for Conference Dinner: Law Society of Ireland, Blackhall Place

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Note from the Editor

Welcome to the October Newsletter. The LOC of the 15th ICP have decided that abstracts will need to be resubmitted as the Colloquium will have been delayed for two years and there will have been a lot of John's research carried out in that period. Abstract submission opened on July 19th and will remain open until October 29th at <https://www.icpdublin.com/abstract>. Don't leave it until the last minute to get your abstract in. There has been a slow response to applications for the Merkal and Helping Hands Awards, so I have included the application forms again, which should be filled in and returned to the Hon. Secretary Treasurer of the IAP, Ray Sweeney before the closing date of October 29th.

We had some friends stay with us over the last weekend. It was the first time since the start of the pandemic that we had visitors, except for family, staying with us. It was really nice to catch up with news and a much better experience than zoom meetings or phone calls.

As I missed the meeting in Mexico, due to a clash of dates with another commitment, it has been six years since I have met up with my paratuberculosis friends and acquaintances and am looking forward to a great end of Covid celebration next June. We have put together a very good social programme and there will be as usual many impromptu meetings, dinners and outings arranged between old friends. If you haven't been before it is great opportunity to meet up with people working in the same field and we hope to have several social events organised targeted at graduate students.

We have a Facebook page at <https://www.facebook.com/paratb2022> and a Twitter page at <https://twitter.com/paratb2022>. Details of places to visit when you come to Ireland will be included on these pages as well as Breaking News about the Colloquium. Hope you can make it to Dublin and looking to making it a very enjoyable time for all the participants.

Included in this issue of the Newsletter are Paratuberculosis News, Database of Paratuberculosis articles published in the last five years, Upcoming Events, List of John's websites and a list of recent publications on paratuberculosis. The next newsletter will be published in January. If you have any interesting items, please send them to me at petermullowney29@gmail.com

Best wishes,

Peter Mullowney

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Cover Photographs (https://www.lawsociety.ie/globalassets/documents/venue-hire/blackhall_events/gallery-page/1283_04d.jpg)

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IAP MEMBER SUPPORT AND RECOGNITION AWARDS

Call for the 15 ICP Edition Awards:

- Richard Merkal Memorial Fellowship
- Helping Hand

Richard Merkal Memorial Fellowship

The Association will provide funding for the participation of graduate students to attend each Colloquium of the Association. Selection will be based on potential for future contributions to the field and scientific merit of a submitted abstract. Funding will include air fare, lodging, general registration and a per diem for meals. All applicants must be members of the Association or sponsored by a member of the Association. The fellowships will not be open to applicants having residence in the same country in which the Colloquium is being held.

Award contents:

Each fellowship will include:

- 1) free full registration for the 15 ICP
- 2) Reimbursement for travel and lodging expenses, and a per diem for meals.
(Maximum reimbursement not to exceed US\$2000.)
- 3) Recognition at the ICP and acceptance of the abstract for an oral presentation in the appropriate session

Timetable:

Deadline for applications:	October 29, 2021
Announcement of awards:	February 1, 2022

Application for Richard Merkal Fellowship to attend the 15th International Colloquium on Paratuberculosis (15ICP) in Dublin, Ireland, June 13-16 2022

Name:

Educational Qualifications:

Current affiliation:

Institution:

Country:

Group leader:

Publications in Paratuberculosis Research:

Abstract of intended presentation: Abstract should be submitted through the ICP15 web portal and a copy included in the application document here.

STATEMENT OF PURPOSE (2 page limit): Importance of the results to be presented, and the candidate's goals for future work in the field of paratuberculosis.

Applications should be sent by e-mail addressed to the Secretary-Treasurer of the IAP (rsweeney@vet.upenn.edu). The application must be a single Word or PDF document with the candidate's name in the file title and shall include the completed forms with statement of purpose and a copy of the abstract.

Helping Hand Fellowships

The Association, based on the availability of funds and as determined by the Governing Board, will provide funding for individuals in need to participate in the Colloquium of The Association. Selection of these individuals will be based on the economic status of the individual's country of origin, a written statement of interest in paratuberculosis, potential for future contributions to the field, and scientific merit of a submitted abstract (Submission of a scientific abstract is required). Applicants may or not be members of the IAP.

Program specifications:

Each award will include:

- 1) free full registration for the 15 ICP
- 2) free IAP membership for 2022 and 2023
- 3) US\$1000 stipend for travel expenses (payable at the conclusion of the 15 ICP)
- 4) Recognition at the General Membership Meeting at the 15ICP

Timetable:

Deadline for applications:	October 29, 2021
Announcement of awards:	February 1, 2022

Application for Helping Hand Fellowship to attend 15th International Colloquium on Paratuberculosis (15ICP) in Dublin, Ireland, July 13-16, 2022

Name:

Country of origin:

Date of Birth:

Educational Qualification:

Current affiliation:

Institution:

Country:

Group leader:

Ph.D Thesis Title (if applicable):

Area of Paratuberculosis Research:

Publications in Paratuberculosis Research:

STATEMENT OF PURPOSE (2 page limit): The applicant must provide a written statement (in English) explaining their interest and experience in paratuberculosis, what they know of the paratuberculosis situation in their country, and why they would like to attend the 15 ICP.

ABSTRACT (An abstract for a presentation at the 15 ICP concerning any aspect of paratuberculosis is required). Abstract should be submitted through the ICP15 web portal and a copy included in the application document here.

Applications should be sent by e-mail addressed to the Secretary-Treasurer of the IAP (rsweeney@vet.upenn.edu). The application must be a single Word or PDF document with the candidate's name in the file title and shall include the completed forms with statement of purpose and a copy of the abstract.



15th International Colloquium for Paratuberculosis 12th – 16th June 2022

Céad Míle Fáilte
(one hundred thousand welcomes)



@paratb2022



paratb2022

The ICP 2022 Organising Committee invites you to the 15th IAP Colloquium in Dublin, Ireland in June 2022. Delegates attending the conference can be assured of a productive and memorable colloquium, discover Irish heritage, culture and music and of course, experience the world renowned hospitality of Ireland.

Ireland is Open for Visitors!!!!

Unprecedented efforts are under way to safeguard public health and limit the spread of COVID-19 on the island of Ireland. The ICP 2022 Organising Committee continues to monitor the situation closely and our **planning towards an in-person Colloquium in June 2022.**

From the 19th of July 2021, the Republic of Ireland is operating the EU Digital COVID Certificate (DCC) for travel originating within the EU/EEA. Ireland will also be welcoming visitors from Great Britain or North America who have valid proof of vaccination (with an EMA-approved vaccine) or have valid proof of recovery from COVID-19 in the last 180 days.

Before arriving in Ireland, you must complete a [Passenger Locator Form](#). The form will be checked before your departure to Ireland – by your airline or ferry company – and you may be asked to show your vaccination certificate. Upon arrival in Ireland, spot checks will be carried out on proof of vaccinations and/or negative RT-PCR tests.

For more detail on travelling to Ireland please visit the Irish Government website www.gov.ie

Call for Abstracts

Abstracts submitted/accepted for the 2020 conference have been cancelled. All authors are invited to re-submit new abstracts.

Abstract submission is open and all abstracts must be submitted through the online system before the **deadline of midnight 29th October 2021**. To submit an abstract and see further details on abstract submission [click here](#)

Registration Details

Registration is open: To register [click here](#)

Early Registration deadline: 2nd March 2022

Online Registration closes: 3rd June 2022

Registration fees

	Early Bird	Standard	On-site
Member	€495	€595	€695
Non Member	€595	€695	€795
Student	€395	€450	€495
Low to Middle Income countries	€395	€450	€495

The registration fee includes:

- ❖ Admission to all sessions and the exhibition
- ❖ Conference materials
- ❖ Tea, coffee and lunches throughout the conference
- ❖ Admission to the Welcome Reception in EPIC Emigration Museum on Sunday the 12th June 2022

Accommodation

Please visit the conference website [here](#) for information on how to book the conference hotel, [Jury's Inn Christchurch](#) including rates per night, per room. Availability is limited and the conference rates only apply until the 26th April 2022 so we advise booking early.

Social Programme

Welcome Reception

Sunday, 12th June 2022 at 19.30

EPIC Irish Emigration Museum, CHQ Building



We have an immersive and unforgettable evening planned in EPIC, The Irish Emigration Museum. The influence the Irish have had around the globe is impressive. EPIC tells the dramatic story of the people who have left the island of Ireland, how these people spread around the globe and how they influenced and shaped the world. Attendance to welcome reception is included in your registration fee and includes a 45 minute guided tours of the museum along with canapes and a drinks reception.

Excursion to the Orchard Centre, Wicklow

Tuesday, 14th June 2022 at 13:00

€40 per person



The half day excursion to the Orchard Centre gives delegates the opportunity to learn more about the history and heritage of the Hayden Family farm, the production of Baileys and more! Places to be booked in advance of the conference through the registration link.

Gala Dinner

Wednesday, 15th June 2022 at 19:30

Law Society of Ireland, Blackhall Place

€50 per person



Delegates attending the Gala Dinner can be assured of an unforgettable evening of excellent food, fine wine, and an evening of cultural entertainment that only Dublin can offer! Tickets to be booked in advance of the conference through the registration link.

For more information visit www.ICPDublin.com

We would like to thank our speakers, delegates, organisers, and sponsors for their continued support of the conference. We believe that we had put together a highly informative and innovative conference programme for 2020/2021 to benefit policy-makers, scientists and industry stakeholders.

Thanks to everyone's efforts we attracted a high number of delegates from a wide range of countries and so it is the committee's decision to postpone the conference again so we can meet in person to share our knowledge on Paratuberculosis.

In October 2020, the Local Organising Committee was faced with the decision of having to postpone again or to have a virtual conference in April 2021. It was decided by the LOC to go for a live conference in June 2022. We were delighted that the organisers of the 16th ICP in Jaipur, India agreed to this and have postponed their Colloquium until 2024.

The ICP 2022 Committee invites you to the 15th IAP Colloquium in Dublin, Ireland in June 2022. Delegates attending the conference can be assured of a productive and memorable colloquium, discover Irish heritage, culture and music and of course, experience the world renowned hospitality of Ireland.

Call for Abstracts

Abstracts submitted/accepted for the 2020 conference have been cancelled. All authors are invited to re-submit new abstracts.

Abstract submission will open on the 19th July 2021. Abstracts must be submitted through the online system at <https://www.icpdublin.com/abstract> by clicking the "Submit Abstract" button before the deadline of midnight 29th October 2021. Notification of acceptance will be made on 16th February 2022.

Only contributions from registered participants will be published. One author at least per submitted paper must be registered for the Colloquium; abstracts for which no authors have registered will not be included in the abstracts book or programme.

Each presenting author may submit a maximum of 5 abstracts. Contributions will be reviewed by scientific sub committees. Instructions for poster or oral presentation will be included in the notification of acceptance.

Condition of Acceptance

1. Authors should ensure that the abstracts are written in acceptable standard English.
2. Please note that errors in the text will not be corrected; the content and literary standard of submitted abstracts is under the author's responsibility.
3. All abstracts will initially be reviewed, graded and accepted or rejected by the sub committees: they reserve the right to determine whether a submission is accepted as oral or poster presentation, or if it has to be set in another session. Notification of acceptance will be sent by the 16th February 2022

Guidelines for abstract preparation

1. Titles should clearly identify the contents of the abstract
2. Abstracts cannot exceed 300 words.
3. Please ensure the correct author is ticked as the presenting author.
4. Only abstracts submitted in English will be reviewed.

The abstract should contain the following:

1. Title
2. Authors
3. Affiliations
4. An introductory sentence indicating the purpose of the study
5. A brief description of methods
6. A summary of new and unpublished data
7. A conclusion

The following will not be permitted in the abstract submission

1. No images are accepted.
2. No bibliography.
3. No tables or graphs.

Topics

1. Diagnostics and detection
2. Host response and immunology
3. National Control programme
4. Pathogenomics, Genotyping and Map diversity
5. Epidemiology and Economics
6. Public health and Map in the environment

Abstract submission

The abstracts must be submitted through the online system closing at midnight 29th October 2021

Themes

Please see descriptions of the abstract themes below.

National Control Programme theme

This theme invites abstracts from researchers and programme managers and seeks to address any aspect of control programmes, such as the design, management and evaluation of programmes including methods for managing programme expectations, measuring motivations for programme engagement and compliance and lessons learnt on how to achieve effective Johne's control. The scope of this theme includes the topics of stakeholder engagement and knowledge transfer innovations.

Diagnostics and Detection

The Scientific Subcommittee for the themed session on Diagnostics and Detection invites submitted abstracts on all aspects of this topic including: diagnostic test application and evaluation, matrix evaluation, novel diagnostic test development and evaluation, diagnostic test validation, investigation of novel diagnostic biomarkers, assessment of novel antigens.

Epidemiology and Economics

Abstracts should be sent to this stream if they deal with the epidemiology of paratuberculosis infection; the impacts of that infection in terms of animal or herd-level production; and/or the economic impacts of infection or control measures.

Host Response and Immunology Theme.

This theme invites abstracts that relate to any aspect of the innate or acquired immunological host response to *M. avium* subsp., paratuberculosis. These can include, but are not necessarily limited to, responses from any host species, the immunological responses to experimental and field vaccines, variation in immunological response to different Map strains, immunological correlates of disease outcome, and factors that influence immune responses to Map

Pathogenomics, Genotyping and Map diversity

The Pathogenomics, Genotyping and MAP diversity sub-theme will consider abstracts in the following areas:

- Application of MAP genomics to transmission studies
- 'Omics' investigations of pathogen biology
- Exploration of host-pathogen interactions
- MAP evolutionary studies

Public Health and MAP in the environment

Abstracts will be considered by the Public Health and MAP in the Environment Sub-Committee, for oral or poster presentation, on the following topics:

- Studies reporting new evidence for/against the involvement of MAP in human disease;
- Studies reporting the occurrence of viable MAP in animal-derived foods or environmental sources (drinking water, rivers, other) that were carried out to assess risk of human exposure to MAP;
- Studies describing environmental monitoring for MAP at farm level;
- Studies describing temporal and spatial distribution of MAP outside the farm environment and/or survival mechanisms used by MAP to persist in the environment;
- Studies describing methods capable of reducing MAP contamination on pasture or in slurry at farm level.
- Studies principally describing development of new detection methods for MAP, or validating new methods for detection of MAP in milk, should not be submitted to this Sub-Committee, but should instead be submitted to the Diagnostics and Detection Sub-Committee for consideration.

Please contact icp2022@abbey.ie if you have any questions

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Expanding membership.

As of June 2020, there are 178 members of the International Association of Paratuberculosis from 29 different countries. There are 39 countries with a population greater than 25 million that do not have a member. You will note later in the newsletter a list of recent publications on Paratuberculosis. There are a total of 46 publications, 5 United States of America; 4 Germany, India, Italy; 3 Australia, Spain; 2 Chile, France, Iran, Ireland and United Kingdom and one each from Austria, Canada, China, Colombia, Denmark, Egypt, Finland, Japan, Kazakhstan, Mexico, Netherlands, Poland and Turkey. The authors of these articles will be written to inviting them to join if they are not already members and if they are from a country that does not have members asked to write a short paragraph for the next newsletter on the incidence of Johne's Disease and research carried out in their country. It would also be very helpful if each member could convince one of their co-workers to become a member of IAP.

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Upcoming Events

[15th International Colloquium for Paratuberculosis](#)

13th – 16th June 2022 Dublin, Ireland

[Seventh International Conference on Mycobacterium bovis](#)

7th - 10th June, 2022 Galway, Ireland

[World Buiatrics Congress 2020](#)

The 31st WBC has been postponed to September 4th - 8th, 2022.

[16th International Symposium of Veterinary Epidemiology and Economics](#)

August 7-12, 2022 in Halifax, Nova Scotia, Canada.

16th ICP 2024 Jaipur, India

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Database of Paratuberculosis articles published in the last five years

A searchable database of all the articles included in the Paratuberculosis Newsletter for the last five years is now available at <http://www.paratuberculosis.net/references.php> .

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List of Johne's websites

Below is a list of websites that give information about paratuberculosis in different countries. If your organisation has a website that you would like to see included please send details to petermullowney29@gmail.com

Argentina

- [Universidad Nacional de Mar Del Plata: Veterinary bacteriology research and diagnosis laboratory](#)

Australia

- [Animal Health Australia](#)
- [Australia and New Zealand Standard Diagnostic Procedures, April 2002](#)

Austria

- [Lymphatic fluid used for the first time to diagnose bovine paratuberculosis](#)

Belgium

- [Paratuberculosis control for milking herds](#)

Brazil

- [Animal Health Australia](#)

Canada

- [Johne's Education, Management and Assistance Program](#) (Ontario)
- [Beef Cattle Research Council](#)
- [Alberta Johne's Initiatives](#)
- [British Columbia Testing](#)
- [Canadian Johne's Disease Initiative](#)

Chile

- [Publications of Miguel Salgado](#)

Colombia

- [Universidad De Antioquia](#)

Czech Republic

- [Veterinary Research Institute](#)

Denmark

- [Statens Serum Institut](#)

France

- [World Organization for Animal Health \(O.I.E\)](#)
- [Bovine Paratuberculosis Control](#)
- [Biology, Epidemiology and Risk Analysis in animal health](#)

Germany

- [Frederic Loeffler Institute](#)

Greece

- [Department of Veterinary Medicine, University of Thessaly](#)

India

- [ICAR-Central Institute for Research on Goats](#)

Ireland

- [Animal Health Ireland](#)
- [Report of the Scientific Committee of the Food Safety Authority of Ireland \(2009\)](#)

Italy

- [Istituto Zooprofilattico Sperimentale della Lombardia](#)

Japan

- [National Institute of Animal Health \(NARO\)](#)

Mexico

- [Universidad Nacional Autonoma de Mexico](#)

Netherlands

- [VeeproHolland](#)
- [GD Animal Health](#)

New Zealand

- [Johne's Disease Research Consortium](#) (New Zealand)
- [New Zealand Deer Industry.](#)

Norway

- [Norwegian Veterinary Institute](#)

Panama

- [Indicisat](#)

Saudi Arabia

- [King Faisal University College of Veterinary Medicine](#)

Slovenia

- [Veterinary Faculty, National Veterinary Institute, Ljubljana](#)

Spain

- [produccionanimal.com Interview with Valentin Perez](#)
- [interview with Joseba Garrido, Director of the Animal Health Department of Neiker-Tecnalia](#)

Switzerland

- [Federal Food Safety and Veterinary Office](#)

Thailand

- [National Institute of Animal Health \(NIAH\)](#)

United Kingdom

- [National Johne's Management Plan \(NJMP\) \(U.K.\)](#)
- [National Animal Disease Information Service](#)
- [PBD Biotech](#)
- [Vetstream](#)
- [Kaz Strycharczyk, of Black Sheep Farm Health gives advice on Johne's in Farmer's Weekly](#)
- [Action Johnes](#)
- [Scottish Agricultural College](#)
- [My Healthy Herd](#)

United States

- [Johne's Information Center \(University of Wisconsin-Madison\)](#)
- [Human Paratuberculosis Foundation, Inc](#)
- [USDA Animal and Plant Inspection Service](#)
- [U.S. Voluntary Bovine Johne's Disease Control Program.](#)
- [The Mycobacterial Diseases of Animals \(MDA\) multi-state initiative \(U.S.A.\)](#)
- [Johne's on the Cattle Site](#)
- [Overview of Paratuberculosis By Michael T. Collins from Merck Manual](#)
- [Center for Food safety and Public Health \(Iowa State\)](#)
- [Hato Sano \(Colorado State\)](#)
- [The Cattle Site \(Some interesting videos on Johne's\)](#)

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Recent publications to October 2021

Most of these articles were published between June 2021 and September 2021.

Aryngaziyev B, Beltramo C, Dondo A, Karymsakov T, Varello K, Gorla M, Di Blasio A, Nodari S, Colussi S, Modesto P, Daugaliyeva A, Acutis PL, Daugaliyeva S, Peletto S. (2020)

[Polymorphisms associated to bovine paratuberculosis: investigation of their role in DNA-protein interactions and transcriptional regulation.](#)

Vet Ital. 2020 Dec 31;56(2):109-114. doi: 10.12834/VetIt.2325.13205.1. Epub 2020 Aug 6. PMID: 32761582

Ashouri M, Nourani H. (2021)

[Pathology, immunohistochemistry and molecular study of cattle screened by comparative tuberculin test for diagnosis latent form of Johne's disease.](#)

Vet Immunol Immunopathol. 2021 Sep;239:110304. doi: 10.1016/j.vetimm.2021.110304. Epub 2021 Jul 21. PMID: 34343749

Autio T, Tuunainen E, Nauholz H, Pirkkalainen H, London L, Pelkonen S. (2021)

[Overview of Control Programs for Non-eu-regulated Cattle Diseases in Finland.](#)

Front Vet Sci. 2021 Jul 30;8:688936. doi: 10.3389/fvets.2021.688936. eCollection 2021. PMID: 34395573

Canive M, González-Recio O, Fernández A, Vázquez P, Badia-Bringué G, Lavín JL, et al. (2021)

[Identification of loci associated with susceptibility to Mycobacterium avium subsp. paratuberculosis infection in Holstein cattle using combinations of diagnostic tests and imputed whole-genome sequence data.](#)

PLoS ONE 16(8): e0256091. <https://doi.org/10.1371/journal.pone.0256091>

Canive, M., Badia-Bringué, G., Vázquez, P., González-Recio, O., Fernandez, A., Garrido, J.M., Juste, R., Alonso-Hearn, M.(2021)

[Host Genetics Underlying Pathological Outcomes to Mycobacterium Avium Subsp. Paratuberculosis Infection is Governed by Distinct Genetic Variants](#)

In review Scientific Reports

Ceciliani F, Ávila Morales G, De Matteis G, Grandoni F, Furioso Ferreira R, Roccabianca P, Lecchi C.(2021)

[Methods in isolation and characterization of bovine monocytes and macrophages.](#)

Methods. 2021 Feb;186:22-41. doi: 10.1016/j.ymeth.2020.06.017. Epub 2020 Jul 2. PMID: 32622986

Conde C, Branger M, Cochard T, Rossignol MN, Fourichon C, Delafosse A, Davergne A, Joly A, Ngwa-Mbot D, Journaux L, Guatteo R, Schibler L, Biet F.(2021)

[Draft Genome Sequences of 142 Mycobacterium avium subsp. paratuberculosis Strains Isolated from Naturally Infected Dairy Cattle.](#)

Microbiol Resour Announc. 2021 Sep 23;10(38):e0069721. doi: 10.1128/MRA.00697-21. Epub 2021 Sep 23. PMID: 34553988

Correa-Valencia NM, Moyano RD, Hernández-Agudelo M, Fernández-Silva JA. (2021)

[Mycobacterium avium subsp. paratuberculosis \(MAP\) molecular diversity in cattle, sheep, and goats from Latin America and the Caribbean: a systematic review.](#)

Trop Anim Health Prod. 2021 Sep 21;53(5):468. doi: 10.1007/s11250-021-02923-9. PMID: 34546430

Corti P, Collado B, Salgado M, Moraga CA, Radic-Schilling S, Tejeda C, Ruiz-Aravena M.(2021)
[Dynamic of Mycobacterium avium subspecies paratuberculosis infection in a domestic-wildlife interface: Domestic sheep and guanaco as reservoir community.](#)

Transbound Emerg Dis. 2021 Aug 4. doi: 10.1111/tbed.14277. Online ahead of print. PMID: 34347393

Cutler K, Taylor B, Boyes G, Todd D, Reader A.(2021)

[Changes to Johne's disease testing regime.](#)

Vet Rec. 2021 Jun;188(11):438. doi: 10.1002/vetr.621. PMID: 34086321

Davis, W.C., Abdellrazeq, G.S., Mahmoud, A. H., Park, K., Elnaggar, M. M., Donofrio, G., Hulubei, V., Fry, L.(2021)

[Advances in Understanding of the Immune Response to Mycobacterial Pathogens and Vaccines through Use of Cattle and Mycobacterium avium subsp. paratuberculosis as a Prototypic Mycobacterial Pathogen](#)

Vaccines (Basel). 2021 Sep 7;9(9):997. doi: 10.3390/vaccines9090997. PMID: 34579234

Didkowska A, Krajewska-Wędzina M, Klich D, Prolejko K, Orłowska B, Anusz K.(2021)

[The Risk of False-Positive Serological Results for Paratuberculosis in Mycobacterium bovis-Infected Cattle.](#)

Pathogens. 2021 Aug 19;10(8):1054. doi: 10.3390/pathogens10081054. PMID: 34451518

Dow CT.(2021)

[Warm, Sweetened Milk at the Twilight of Immunity - Alzheimer's Disease - Inflammaging, Insulin Resistance, M. paratuberculosis and Immunosenescence.](#)

Front Immunol. 2021 Aug 5;12:714179. doi: 10.3389/fimmu.2021.714179. eCollection 2021. PMID: 34421917

Elmagzoub WA, Adam NM, Idris SM, Mukhtar ME, Abdelaziz SA, Okuni JB, Ojok L, Abd El Wahed A, Eltayeb E, Gameel AA, Eltom KH.(2020)

[Seroprevalence of Mycobacterium avium subsp. paratuberculosis in Dairy Cattle in Khartoum State, Sudan.](#)

Vet Sci. 2020 Dec 21;7(4):209. doi: 10.3390/vetsci7040209.

Garg A, Singhal N, Kumar M.(2021)

[Discerning novel drug targets for treating Mycobacterium avium ss. paratuberculosis-associated autoimmune disorders: an in silico approach.](#)

Brief Bioinform. 2021 May 20;22(3):bbaa195. doi: 10.1093/bib/bbaa195. PMID: 32895696

Gavey L, Citer L, More SJ, Graham D.(2021)

[The Irish Johne's Control Programme.](#)

Front Vet Sci. 2021 Aug 27;8:703843. doi: 10.3389/fvets.2021.703843. eCollection 2021. PMID: 34513971

Gschaidner S, Köchler J, Spergser J, Tichy A, Mader C, Vill M, Ortner P, Kössler J, Khol JL.(2021)

[Individual faecal and boot swab sampling to determine John's disease status in small cattle herds.](#)

Vet Ital. 2021 May 11;57(1):19-27. doi: 10.12834/VetIt.1389.7584.2. PMID: 34313095

- Gupta S, Chaubey KK, Agarwal P, Kuenstner JT, Parashar D, Singh SV.(2021)
[Therapeutic management of Mycobacterium avium subspecies paratuberculosis infection with complete resolution of symptoms and disease in a patient with advanced inflammatory bowel syndrome.](#)
 Mol Biol Rep. 2021 Oct;48(10):7013-7020. doi: 10.1007/s11033-021-06615-3. Epub 2021 Aug 12. PMID: 34383243
- Hayashi F, Isobe N, Cossu D, Yokoyama K, Sakoda A, Matsushita T, Hattori N, Kira JI.(2021)
[Elevated mycobacterium avium subsp. paratuberculosis \(MAP\) antibody titer in Japanese multiple sclerosis.](#)
 J Neuroimmunol. 2021 Aug 25;360:577701. doi: 10.1016/j.jneuroim.2021.577701. Online ahead of print. PMID: 34507015
- Hosseini Porgham S, Biet F, Ganneau C, Bannantine JP, Bay S, Sechi LA.(2021)
[A Comparative Study on the Efficiency of Two Mycobacterium avium subsp. paratuberculosis \(MAP\)-Derived Lipopeptides of L3P and L5P as Capture Antigens in an In-House Milk ELISA Test.](#)
 Vaccines (Basel). 2021 Sep 7;9(9):997. doi: 10.3390/vaccines9090997. PMID: 34579234
- Howard, L.L., Metzler, S., Witte, C.L.(2021)
[THIRTY YEARS OF JOHNE'S DISEASE \(Mycobacterium avium subsp. paratuberculosis\) SURVEILLANCE AT THE SAN DIEGO ZOO SAFARI PARK](#)
 Proceedings 2021 Joint AAZV EAZWV Conference, 2021
- Jackson RB, Kennedy DJ, Sergeant E. (2021)
[Investigation of Johne's disease in Tasmanian fallow deer \(Dama dama\).](#)
 Aust Vet J. 2021 Jan;99(1-2):44-45. doi: 10.1111/avj.13030. Epub 2020 Oct 15. PMID: 33063317
- Jain M, Kumar A, Polavarapu R, Gupta S, Aseri GK, Sharma D, Sohal JS.(2021)
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