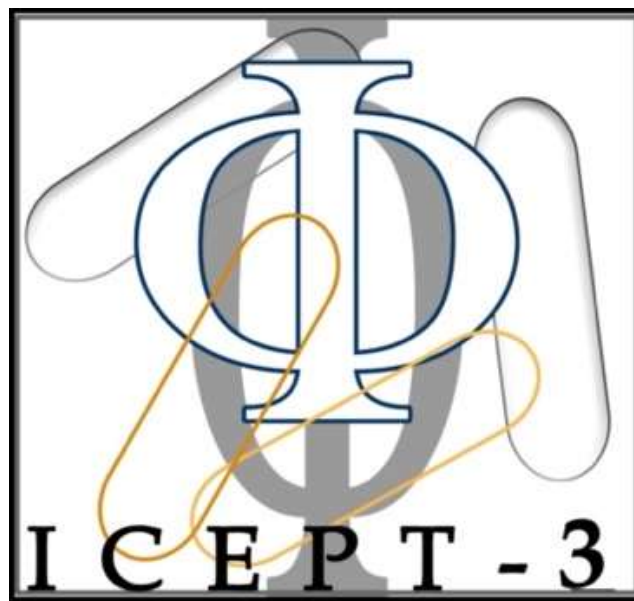


International Congresses on the Evolution and Paleoepidemiology of Infectious Diseases (ICEPID)

Coordinators of the ICEPID series: Olivier DUTOUR (France) & György PÁLFI (Hungary)

International Conference on the Evolution and Paleoepidemiology of Tuberculosis (ICEPT)

ICEPT-3 TB Evolution Meeting, Szeged, Hungary / ICEPID-7



ICEPT-3 Meeting – Tuberculosis in Evolution

5th–6th July 2022, Szeged, Hungary

Institute of Biology, University of Szeged

<https://www2.bio.u-szeged.hu/icept-3>

ICEPT-3 e-mail: icept3.tb.meeting@gmail.com

ICEPT-3 Meeting – Tuberculosis in Evolution

5th–6th July 2022, Szeged, Hungary



ICEPT-3 International Organizing Committee

Pálfi, György (head) – Szeged, Hungary
Dutour, Olivier – Paris/Bordeaux, France
Zink, Albert – Bolzano, Italy
Sola, Christophe – Paris, France
Coqueugniot, Hélène – Bordeaux/Paris, France
Hajdu, Tamás – Budapest, Hungary

ICEPT-3 Local Organizing Committee (University of Szeged, Hungary)

Spekker, Olga (head)
Molnár, Erika; Bereczki, Zsolt; Tihanyi, Balázs; Kis, Luca; Gara, Barbara; Nagy, Réka;
Király, Kitty; Paja, László; Váradi, Orsolya Anna; Homolya, Ernő; Rovó, János;
Vereczkei-Mócza, Krisztina

ICEPT-3 International Scientific Committee

Co-presidents of the Scientific Committee

Brosch, Roland – Paris, France
Pap, Ildikó – Szeged/Budapest, Hungary

Members

Buikstra, Jane – Tempe, USA	Mokrousov, Igor – St. Petersburg, Russia
Buzhilova, Alexandra – Moscow, Russia	Molnár, Erika – Szeged, Hungary
Comas, Iñaki – Valencia, Spain	Niemann, Stefan – Borstel, Germany
Coqueugniot, Hélène – Bordeaux/Paris, France	Pálfi, György – Szeged, Hungary
Donoghue, Helen D. – London, UK	Refrégier, Guislaine – Paris, France
Dutour, Olivier – Paris/Bordeaux, France	Santos, Ana Luisa – Coimbra, Portugal
Hajdu, Tamás – Budapest, Hungary	Schultz, Michael – Göttingen, Germany
Hershkovitz, Israel – Tel-Aviv, Israel	Sola, Christophe – Paris, France
Jankauskas, Rimantas – Vilnius, Lithuania	Spigelman, Mark – Sydney, Australia
Maixner, Frank – Bolzano, Italy	Wirth, Thierry – Paris, France
Merker, Matthias – Borstel, Germany	Zink, Albert – Bolzano, Italy

ICEPT-3 Funding

The conference is supported by the K 125561 ('Tuberculosis and Evolution') research grant of the National Research, Development and Innovation Office (NKFIH – Hungary) & the Department of Biological Anthropology, University of Szeged, Hungary

ICEPT-3 Meeting – Tuberculosis in Evolution

5th–6th July 2022, Szeged, Hungary



Introduction

A quarter of century after the first international 'ICEPT' meeting on the evolution of tuberculosis (1997, Szeged, Hungary) and ten years after 'ICEPT-2', 'ICEPT-3' – a new international TB evolution meeting – will be held in Szeged. This third conference will review the latest results of research on TB evolution and TB paleopathology again.

The main questions of ICEPT-3 are the same as previously:

- What is the oldest evidence of this infection on human and animal remains?;
- When did specific mutation(s) of the modern strains arise?;
- What was the relative importance of the different pathogenic species of the *Mycobacterium* genus in past populations?;
- Did the pre-contact American TB differ from the Old World infection?;
- How can we explore the dynamics of the host-pathogen co-evolution in the case of TB infection?;
- Can we reconstruct a consensual phylogeny of the *Mycobacterium* genus?;
- What do we know about the evolution of susceptibility/resistance patterns among human populations?;
- How can paleopathology and paleomicrobiology contribute to the research of TB evolution?;
- What are the main strategies to stop or moderate the re-emergence of TB?; and
- How can molecular phylogenetics contribute to the global fight against TB?.

The ICEPT-3 'Tuberculosis in Evolution' Meeting will be held in a **HYBRID format**, allowing for both in-person and online participation.

The in-person conference venue will be the Institute of Biology, University of Szeged, Közép fasor 52, H-6726 Szeged, Hungary:

<https://www.google.com/maps/place/Szeged,+SZTE+biol%C3%B3giai+%C3%A9p%C3%BClet%C3%A9ben,+K%C3%B6z%C3%A9p+fasor+52,+6726/@46.2457013,20.1658849,17z/data=!3m1!4b1!4m5!3m4!1s0x4744884487866375:0xdc248190153d973b!8m2!3d46.2457013!4d20.1680736>

For online attendees, a Zoom link is provided for the first (5th July 2022, Tuesday: <https://us02web.zoom.us/j/89598324839?pwd=z90HppQVjojJSQ-Z0AfTINyVnWThYa.1;> Meeting ID: 895 9832 4839; Passcode: 725973) and second (6th July 2022, Wednesday: https://us02web.zoom.us/j/83499663729?pwd=VX_TLwF_gDiEAVDxBP2BodRCOxsrG7.1; Meeting ID: 834 9966 3729; Passcode: 291127) day of the meeting.

Any person who wishes to attend the conference, in-person or online, is welcome and does not have to pay registration fees.

Because of the very tight conference schedule, the speakers are kindly asked to respect the 20-minute time limit (preferably, 15-minute talk and 5-minute discussion).

Similar to the ICEPT-2 conference proceedings (Szeged, Hungary, 2012; https://www.academia.edu/16403178/Tuberculosis_in_Evolution_Supplement_Issue_YTU_BE_95_S1), the ICEPT-3 conference proceedings will be published in a special issue of *Tuberculosis*.

ICEPT-3 Meeting – Tuberculosis in Evolution

5th–6th July 2022, Szeged, Hungary



PROGRAM

VENUE: Institute of Biology, University of Szeged

Közép fasor 52, H-6726 Szeged, Hungary

Szent-Györgyi Albert Room

Moderators: Zsolt BEREZKI & László PAJA (University of Szeged)

5TH JULY 2022, TUESDAY

(<https://us02web.zoom.us/j/89598324839?pwd=z90HppQVjojJSQ-Z0AftINyVnWThYa.1>; Meeting ID: 895 9832 4839; Passcode: 725973)

09:30–10:00 REGISTRATION

10:00–12:30 OPENING SESSION

10:00–10:20 WELCOME ADDRESSES

- ‘Greetings’ by Attila GÁCSER, head of the Institute of Biology, University of Szeged
- ‘The ICEPID series’ by Olivier DUTOUR
- ‘Three ICEPT meetings in Szeged’ by György PÁLFI

10:20–10:40 (in-person)

Albert ZINK, Heidi Y. JÄGER, Guido VALVERDE, Ildikó PAP, Ildikó SZIKOSSY, György PÁLFI, Frank MAIXNER: Tuberculosis in mummies – New findings, perspectives and limitations

10:40–11:00 (online)

Kara L. HOLLOWAY-KEW, Maciej HENNEBERG: Dynamics of tuberculosis infection in various populations during the 19th and 20th century: The impact of conservative and pharmaceutical treatments on epidemiological observations

11:00–11:20 (in-person)

Frank MAIXNER, Heidi Y. JÄGER, Mohamed S. SARHAN, Guido VALVERDE, Albert ZINK: *Mycobacterium tuberculosis* DNA extraction from mummified and skeletal human remains using Linear Polyacrylamide (LPA)

11:20–11:40 COFFEE BREAK

11:40–12:00 (online)

Heidi Y. JÄGER, Frank MAIXNER, Albert ZINK: A leap in the dark – How intra-bone variability of pathogen load affects metagenomic detection in ancient *Mycobacterium tuberculosis* DNA in skeletal human remains

12:00–12:20 (online)

Andrei SOFICARU, Mihai CONSTANTINESCU, Luminița ADREICA: Cases of tuberculosis from the St. Sava cemetery (Bucharest) and comments over a sample from the 20th century

12:20–12:40 (online)

Ana Luisa SANTOS, Bruno M. MAGALHÃES, Cinzia ROGGIO: Changes in mortality by TB in non-industrialized Coimbra (Portugal): Trends between 1861 and 1914

12:40–13:00 (online)

Jenna M. DITTMAR, Piers D. MITCHELL, Sarah A. INSKIP, Craig CESSFORD, John E. ROBB: Diseased cities: An examination of tuberculosis and other chronic respiratory diseases surrounding the time of the Black Death in Cambridge, England

13:00–13:20 (online)

Françoise LE MORT, Oussama BAKER, **Bérénice CHAMEL**, Hélène COQUEUGNIOT, Olivier DUTOUR: Oldest evidence of tuberculosis in the Mediterranean islands: From the mainland to Cyprus

13:20–14:40

LUNCH BREAK

14:40–15:00 (in-person)

Anett GÉMES, Antónia MARCSIK, Katalin Éva GYENESEI, Tamás SZENICZEY, Krisztián KISS, Kitti KÖHLER, **Tamás HAJDU**: Tuberculosis in prehistory in Eastern Central Europe – Chronological and geographical distribution

15:00–15:20 (in-person)

Krisztián KISS, Antónia MARCSIK, Erika MOLNÁR, György PÁLFI, Mónika MERCZI, Ivett KŐVÁRI, Orsolya LÁSZLÓ, Sándor ÉVINGER, Csilla LIBOR, Katalin Éva GYENESEI, Csilla Emese NÉMETH, Ágota MADAI, Anett GÉMES, István JÁNOS, Tamás HAJDU, Tamás SZENICZEY: One millennium (2nd–12th century AD) of the White Plague in the Carpathian Basin – New cases, expanding knowledge

15:20–15:40 (in-person)

Csilla LIBOR, Tamás HAJDU, Loránd O. KOVÁCS, László KUNOS, Orsolya MATEOVICS-LÁSZLÓ: "TB on the spot" – Discussion on an atypical extra-spinal presentation of tuberculosis from a Late Medieval Hungarian cemetery

15:40–16:00

COFFEE BREAK

16:00–16:20 (in-person)

Olga SPEKKER, David R. HUNT, Erika MOLNÁR, György PÁLFI, Michael SCHULTZ: New insights into the palaeopathological diagnosis of tuberculous meningitis

16:20–16:40 (online)

Tanvi P. HONAP, Áshild J. VÅGENE, Kelly M. HARKINS, Michael S. ROSENBERG, Karen GIFFIN, Felipe CÁRDENAS-ARROYO, Laura Paloma LEGUIZAMÓN, Judith ARNETT, Jane E. BUIKSTRA, Alexander HERBIG, Johannes KRAUSE, Kirsten I. BOS, Anne C. STONE: Ancient *Mycobacterium pinnipedii* genomes recovered from non-coastal peoples from pre-contact era South America highlight the complexity of tuberculosis transmission in the past

16:40–17:00 (online)

Elizabeth A. NELSON, Aditya Kumar LANKALIPALLI, Maria SPYROU, Áshild VÅGENE, Susanna SABIN, Tiffany A. TUNG, Alexander HERBIG, Kirsten I. BOS: Imperial decline, drought, and disease: Contextualizing tuberculosis in pre-Hispanic Peru

17:00–17:20 (online)

Kelly E. BLEVINS, Elizabeth A. NELSON, Alexander HERBIG, Johannes KRAUSE, Jane E. BUIKSTRA, Josefina MANSILLA LORY, Kirsten I. BOS, Anne C. STONE: Combining paleopathology and ancient DNA to infer the paleoepidemiology and evolutionary history of the *Mycobacterium tuberculosis* complex in pre-conquest Mesoamerica

17:20–17:40 (online)

Qingyun LIU: Evolutionary dynamics and local adaptation of *Mycobacterium tuberculosis* encountering different host populations

17:40–18:00 (online)

Jorge A. SUBY: Following the trail of tuberculosis in Argentina: From hunter-gatherers and pastoralists to industrialized populations

The program continues on the next page with the schedule of the second day of ICEPT-3.

6TH JULY 2022, WEDNESDAY

(https://us02web.zoom.us/j/83499663729?pwd=VX_TLwF_gDiEAVDxBP2BodRCOxsrG7.1; Meeting ID: 834 9966 3729; Passcode: 291127)

10:00–10:20 (online)

Roland BROSCHE: Evolution of tubercle bacilli, from recombinogenic to clonal populations

10:20–10:40 (online)

Christophe SOLA, Gaëtan SENELLE, Muhammed Rabiou SAHAL, Kevin LA, Typhaine BILLARD-POMARES, Julie MARIN, Antoine BRIDIER-NAHMIAS, Guislaine REFRÉGIER, Etienne CARBONNELLE, Emmanuelle CAMBAU, Christophe GUYEUX: *Mycobacterium tuberculosis* genomics and Big Data

10:40–11:00 (online)

Christophe GUYEUX, Gaëtan SENELLE, Guislaine REFRÉGIER, Christophe SOLA: A deeper understanding of the evolutionary phylogeny of *M. tuberculosis*

11:00–11:20 (in-person)

Adrien LE MEUR, Rima ZEIN EDDINE, Christophe GUYEUX, Gaëtan SENELLE, Christophe SOLA, Fiona HAK, Charlotte GENESTET, Oana DUMITRESCU, Noémie BOZIER, Amaury PIERRARD, Stéphane SKOULOUBRIS, Hannu MYLLYKALLIO, **Guislaine REFRÉGIER**: The paradoxes of *Mycobacterium tuberculosis* molecular evolution and consequences for the inference of past molecular diversity

11:20–11:40

COFFEE BREAK

11:40–12:00 (in-person)

Olga SPEKKER, Orsolya Anna VÁRADI, András SZEKERES, Heidi Y. JÄGER, Albert ZINK, Margit BERNER, Doris PANY-KUCERA, Liesa STRONDL, Paul KLOSTERMANN, Levente SAMU, Kitty KIRÁLY, Zsolt BERECHKI, Erika MOLNÁR, György PÁLFI, Balázs TIHANYI: The first reported archaeological case with calvarial tuberculosis from the present-day territory of Hungary

12:00–12:20 (online)

Alexandra BUZHILOVA, Natalia BEREZINA: Tuberculosis in the daily life of the ancient Eastern European pastoralists (environmental aspects)

12:20–12:40 (in-person)

Ildikó PAP, Ildikó SZIKOSSY, György PÁLFI: 25 years of international TB research on the Vác Mummy Collection

12:40–13:00 (in-person)

Hélène COQUEUGNIOT, György PÁLFI, Bernard GÉLY, Olivier DUTOUR: Paleoimaging of Azilian human remains from Les Iboussières (France) as evidence of possible Upper Paleolithic tuberculosis

13:00–13:20 (in-person)

Olivier DUTOUR: The paleopathology and paleoepidemiology of Upper Paleolithic tuberculosis: Facts and theories

13:20–14:40

LUNCH BREAK

14:40–15:00 (online)

Igor MOKROUSOV: Pathobiology and phylogenomics of *M. tuberculosis* Beijing and LAM genotypes in Russia

15:00–15:20 (online)

Stefan NIEMANN: Using genomic approaches to understand drug resistance evolution of *Mycobacterium tuberculosis*

15:20–15:40 (online)

Matthias MERKER, Jean-Philippe RASIGADE, Maxime BARBIER, Helen COX, Silke FEUERRIEGEL, Thomas A. KOHL, Egor SHITIKOV, Kadri KLAOS, Cyril GAUDIN, Rudy ANTOINE, Roland DIEL, Sonia BORRELL, Sebastien GAGNEUX, Vladyslav NIKOLAYEVSKYY, Sönke ANDRES, Valeriu CRUDU, Ulrich NÜBEL, Philip SUPPLY, Stefan NIEMANN, Thierry WIRTH: Transcontinental spread and evolution of an MDR *M. tuberculosis* clade over five decades

15:40–16:00 (online)

Álvaro CHINER-OMS, Mariana Gabriela LÓPEZ, Miguel MORENO-MOLINA, Victoria FURIÓ, Iñaki COMAS: Gene evolutionary trajectories in *Mycobacterium tuberculosis* reveal temporal signs of selection

16:00–16:20

COFFEE BREAK

16:20–16:40 (in-person)

Thierry WIRTH, Emilie ROUSSEAU, Nour GHARBI, Matthias MERKER, Stefan NIEMANN: Tracking clock variations, contrasted demographies and selection signatures in *Mycobacterium tuberculosis* lineages: From simulations to the field

16:40–18:40

DAVID E. MINNIKIN'S MEMORIAL SESSION

16:40–17:00

A brief tribute to David Minnikin's oeuvre

17:00–17:20 (online)

Helen D. DONOGHUE: Tuberculosis in historical material using ancient DNA and cell wall lipids

17:20–17:40 (in-person)

Houdini H.T. WU, Oona Y-C. LEE, David E. MINNIKIN, Gurdyal S. BESRA: An era of mycobacterial cell wall lipid biomarkers

17:40–18:00 (in-person)

György PÁLFI, Olga SPEKKER, Erika MOLNÁR, Zsolt BEREZKI, Hélène COQUEUGNIOT, Olivier DUTOUR, Anna-marie TILLIER, Zsolt MESTER, Enikő SZVÁK, Wilfried ROSENDAHL, Antal SKLÁNITZ, Frank MAIXNER, Albert ZINK, David E. MINNIKIN, Ildikó PAP: Re-examination and possible TB infection of the Subalyuk Neanderthal remains (Subalyuk Cave, Hungary)

18:00–18:20 (in-person)

Oona Y-C. LEE, Houdini H.T. WU, David E. MINNIKIN, Gurdyal S. BESRA, Gareth LLEWELLYN, Christopher M. WILLIAMS, Heidi Y. JÄGER, Frank MAIXNER, Albert ZINK, Mihály GASPARIK, Ildikó PAP, György PÁLFI: Sensitive detection of mycobacterial cell wall lipid biomarkers in Neanderthal skeletons from Subalyuk, Hungary

18:20–18:40 (in-person)

Orsolya Anna VÁRADI, Olga SPEKKER, Heidi Y. JÄGER, Frank MAIXNER, Albert ZINK, Dávid RAKK, Csaba VÁGVÖLGYI, Gabriella TERHES, Enikő SZVÁK, Ildikó PAP, Ildikó SZIKOSSY, György PÁLFI, András SZEKERES, David E. MINNIKIN: The development, verification and objectives of a mycocerosic acid based HPLC-HRMS method for TB diagnostics in paleopathology

18:40–18:50

CLOSING REMARKS by the Organizers of ICEPT-3