

Kirsten I. Bos

Curriculum Vitae



Max Planck Institute for the Science of Human History
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Citizenship: Canadian

Academic Affiliation

Group Leader, Molecular Palaeopathology
Max Planck Institute for the Science of Human History, Jena, Germany

Research Interests: palaeopathology, infectious disease, ancient DNA, skeletal biology, microbiology, disease resistance

Citations since 2015: 3956
h-index since 2015: 26

Education

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| 2012 | Doctor of Philosophy, Department of Anthropology, McMaster University
Thesis title: <i>Genetic investigations into the Black Death</i>
Supervisory committee: Hendrik Poinar (advisor), D. Ann Herring, G. Brian Golding |
| 2006 | Ph.D. comprehensive examination completed, "with distinction" |

- 2004 Master of Arts, Department of Anthropology, McMaster University
 Thesis title: *Trinitapoli: a preliminary evaluation of the human skeletal material recovered from a Middle Bronze Age burial site in southern Italy*
 Supervisory committee: Shelley R. Saunders (advisor), D. Ann Herring, Anne Keenleyside
- 2002 pre-Master's year, University of Manitoba, Department of Anthropology
 Supervisor: Robert D. Hoppa
- 2001 Honours Bachelor of Science "with distinction",
 Specialized Honours Bio-medical Science,
 University of Guelph

Grants and fellowships

Currency shown in Canadian dollars unless otherwise specified

- 2018 European Research Council (ERC) Starting Grant (1,490,043 €)
- 2011 SSHRC postdoctoral fellowship (24 months) (\$81,000)
- 2009 McMaster University Graduate Student Association Travel Grant (\$500)
- 2008 McMaster University Graduate Fellowship (PhD level) (\$10,000)
- 2004 SSHRC Canada Graduate Scholarship (PhD level) (\$105,000)
- 2004 Ontario Graduate Scholarship (\$15,000), declined
- 2003 McMaster University Graduate Student Association Travel Grant (\$200)
- 2003 SSHRC Canada Graduate Scholarship (Master's level) (\$17,500)
- 2003 Ontario Graduate Scholarship (\$15,000), declined
- 2003 Italian Government "Borsa di studio" (\$1838)
- 2002 McMaster University Graduate Fellowship (\$4000)
- 2002 McMaster University Dept. of Anthropology entrance scholarship (\$2000)

Employment

2015 – present	Group Leader, Max Planck Institute for the Science of Human History
2018 – 2019	4 months part-time maternity leave
2017 – 2018	10 months full time maternity leave
2016 – 2017	12 months part-time maternity leave
2015 - 2016	6 months full-time maternity leave
2012 – 2015	Postdoctoral researcher, University of Tuebingen
2001 – 2012	Principal oboe, Guelph Symphony Orchestra
2002 – 2010	McMaster University teaching assistant, Dept. of Anthropology
2004 – 2008	Editorial assistant, International Journal of Osteoarchaeology
2001	Research assistant, University of Manitoba, Department of Anthropology
2000	National Research Council of Canada summer student

Internal funding

Current position includes a 100,000€ annual research budget

Refereed Journal Publications

*denotes corresponding author

- 2020* Head, Shoulders, Knees, and Toes: A large scale, systematic investigation of DNA preservation across medieval skeletal elements. Cody Parker, AB Rohrlach, Susanne Friederich, Sarah Nagel, Matthias Meyer, Johannes Krause, Kirsten I. Bos, Wolfgang Haak. *Scientific Reports*, doi.org/10.1101/2020.05.20.106971
- 2020* Estimating molecular preservation of the intestinal microbiome via metagenomic analyses of latrine sediments from two medieval cities. Susanna Sabin, Hui-Yuan Yeh, Aleks Pluskowski, Christa Clamer, Piers D. Mitchell, **Kirsten I. Bos**. *Philosophical Transactions for the Royal Society Series B*, doi.org/10.1098/rstb.2019.0576
- 2020* A seventeenth century *Mycobacterium tuberculosis* genome supports a Neolithic emergence of the *Mycobacterium tuberculosis* complex. Susanna Sabin, Åshild J, Vågane, Torjörn Ahlström, Gracijela Bozovic, Caroline Arcini, Denise Kühnert, and Kirsten I. Bos. *Genome Biology* **21**(201)
- 2020* A treponemal genome from an historic plague victim supports a recent emergence of yaws and its presence in 15th century Europe. Karen Giffin, Aditya Kumar Lankapalli, Susanna Sabin, Maria A. Spyrou, Cosimo Posth, Justina Kozakaitė, Ronny Friedrich, Žydrūnė Miliauskienė, Rimantas Jankauskas, Alexander Herbig, and **Kirsten I. Bos**. *Scientific Reports*, **10**(9499)
- 2020 Emergence of human-adapted *Salmonella enterica* is linked to the Neolithization process. Felix M Key, Cosimo Posth, Luis R Esquivel-Gomez, Ron Hübner, Maria A Spyrou, Gunnar U Neumann, Anja Furtwängler, Susanna Sabin, Marta Burri, Antje Wissgott, Aditya Kumar Lankapalli, Åshild J Vågane, Matthias Meyer, Sarah Nagel, Rezeda Tukhbatova, Aleksandr Khokhlov, Andrey Chizhevsky, Svend Hansen, Andrey B Belinsky, Alexey Kalmykov, Anatoly R Kantorovich, Vladimir E Maslov, Philipp W Stockhammer, Stefania Vai, Monica Zavattaro, Alessandro Riga, David Caramelli, Robin Skeates, Jessica Beckett, Maria Giuseppina Gradoli, Noah Steuri, Albert Hafner, Marianne Ramstein, Inga Siebke, Sandra Lösch, Yilmaz Selim Erdal, Nabil-Fareed Alikhan, Zhemin Zhou, Mark Achtman, **Kirsten Bos**, Sabine Reinhold, Wolfgang Haak, Denise Kühnert, Alexander Herbig, Johannes Krause. *Nature ecology & evolution* 4 (3), 324-333

- 2020* Advances in the molecular detection of tuberculosis in pre-contact Andean South America. EA Nelson, JE Buikstra, A Herbig, TA Tung, and **KI Bos**. *International Journal of Paleopathology*, online only.
- 2019 HOPS: Automated detection and authentication of pathogen DNA in archaeological remains. R Hübler, FM Key, C Warinner, **KI Bos**, J Krause, A Herbig. *Genome Biology* 20(10):1-13.
- 2019 Ancient *Yersinia pestis* genomes from across Western Europe reveal early diversification during the First Pandemic (541-750). Marcel Keller, Maria A. Spyrou, Christina L. Scheib, Gunnar U. Neumann, Andreas Kröpelin, Brigitte Haas-Gebhard, Bernd Pääffgen, Jochen Haberstroh, Albert Ribera i Lacomba, Claude Raynaud, Craig Cessford, Raphaël Durand, Peter Stadler, Kathrin Nägele, Jessica S. Bates, Bernd Trautmann, Sarah A. Inskip, Joris Peters, John E. Robb, Toomas Kivisild, Dominique Castex, Michael McCormick, **Kirsten I. Bos**, Michaela Harbeck, Alexander Herbig, and Johannes Krause. *Proceedings of the National Academy of Sciences* 116(25):12363-12372.
- 2019* Phylogeography of the second plague pandemic revealed through analysis of historical *Yersinia pestis* genomes. Maria A Spyrou, Marcel Keller, Rezeda I Tukhbatova, Christiana L Scheib, Elizabeth A Nelson, Aida Andrades Valtueña, Gunnar U Neumann, Don Walker, Amelie Alterauge, Niamh Carty, Craig Cessford, Hermann Fetz, Michaël Gourvennec, Robert Hartle, Michael Henderson, Kristin von Heyking, Sarah A Inskip, Sacha Kacki, Felix M Key, Elizabeth L Knox, Christian Later, Prishita Maheshwari-Aplin, Joris Peters, John E Robb, Jürgen Schreiber, Toomas Kivisild, Dominique Castex, Sandra Lösch, Michaela Harbeck, Alexander Herbig, **Kirsten I Bos**, Johannes Krause. *Nature Communications* 10(1): 1-13.
- 2019* **Kirsten I. Bos**, Denise Kühnert, Alexander Herbig, Luis Esquivel Gomes, et al. Paleomicrobiology: Diagnosis and Evolution of Ancient Pathogen. *Annual Review of Microbiology* (73).
- 2019 Maria A. Spyrou, **Kirsten I. Bos**, Alexander Herbig, and Johannes Krause. Ancient pathogen genomics as an emerging tool for infectious disease research. *Nature Reviews Genetics*. 20(6):323-340
- 2018* **Kirsten I. Bos**. TB's Chinese Travels. *Nature Ecology and Evolution* 2(12) 1842.

- 2018 Verena J. Schuenemann, Aditya Kumar Lankapalli, Rodrigo Barquera, Elizabeth A. Nelson, Diana Iraíz J. Hernández, Victor Acuña Alonzo, **Kirsten I. Bos**, Lourdes Márques Morfín, Alexander Herbig, and Johannes Krause. Historic *Treponema pallidum* genomes from Colonial Mexico retrieved from archaeological remains. *PLoS Neglected Tropical Diseases*. doi.org/10.1371/journal.pntd.0006447
- 2018 Sascha Knauf, Jan F. Gogarten, Verena J. Schuenemann, Hélène M. De Nys, Ariane Dux, Michal Strouhal, Lenka Mikalová, **Kirsten I. Bos**,... Sébastien Calvignac-Spencer. Nonhuman primates across sub-Saharan Africa are infected with the yaws bacterium *Treponema pallidum* subsp. *Pertenue*. *Emerging Microbes & Infection*. doi: 10.1038/s41426-018-0156-4
- 2018* Maria A. Spyrou, Rezeda I. Tukhbatova, Chuan-Chao Wang, Aida Andrades Valtueña, Aditya K. Lankapalli, Vitaly V. Kondrashin, Victor A. Tsybin, Aleksandr Khokhloc, Denise Kühnert, Alexander Herbig, **Kirsten I. Bos**, Johannes Krause. Analysis of 3800-year-old *Yersinia pestis* genomes suggests Bronze Age origin for bubonic plague. *Nature Communications* doi: 10.1038/s41467-018-04550-9
- 2018* Allison E. Mann, Susanna Sabin, Kirsten Ziesemer, Åshild J. Vågane, Hannes Schroeder, ... **Kirsten I. Bos** and Christina Warriner. Differential preservation of endogenous human and microbial DNA in dental calculus and dentin. *Scientific Reports*, doi:10.1038/s41598-018-28091-9
- 2018* Åshild J. Vågane, Alexander Herbig, Michael G. Campana, Nelly M. Robles García, Christina Warriner, Susanna Sabin, Maria A. Spyrou, Aida Andrades Valtueña, Daniel Huson, Noreen Tuross, **Kirsten I. Bos**, Johannes Krause. *Salmonella enterica* genomes from victims of a major sixteenth-century epidemic in Mexico. *Nature Ecology and Evolution* 2:520-528, doi: 10.1038/s41559-017-0446-6.
- 2017 Andrades Valtuena A, Mitnik A, Key FM, Haak W, Allmæ R, Belinskij A, Daubaras M, Feldman M, Jankauskas R, Janković I, Massy K, Novak M, Pfrengle S, Reinhold S, Šlaus M, Spyrou MA, Szécsényi-Nagy A, Törv M, Hansen S, **Bos KI**, Stockhammer PW, Herbig A, Krause J. The Stone Age Plague and Its Persistence in Eurasia. *Current Biology* 27(23):3683-3691, doi.org/10.1016/j.cub.2017.10.025.

- 2017* Felix M. Key, Cosimo Posth, Johannes Krause, Alexander Herbig, and **Kirsten I. Bos**. Mining metagenomic datasets for ancient DNA: recommended protocols for authentication. *Trends in Genetics*, dx.doi.org/10.1016/j.tig.2017.05.005.
- 2016 Alexander Immel, Adeline Le Cabec, Marion Bonazzi, Alexander Herbig, Heiko Temming, Verena J. Schuenemann, **Kirsten I. Bos**, et. al. Effect of X-ray imaging on ancient DNA in sub-fossil bones – recommendations for safe imaging. *Scientific Reports*, 6:32969, doi: 10.1038/srep32969.
- 2016 Natasha Arora, Verena J. Schuenemann, Günter Jäger, Alexander Peltzer, Alexander Seitz, Alexander Herbig, Michal Strouhal, Linda Grillová, Leonor Sánchez-Busó, Denise Kühnert, **Kirsten I Bos**, et al. Origin of modern syphilis and emergence of a contemporary pandemic cluster, *Nature Microbiology*, 2:16245, doi: 10.1038/nmicrobiol.2016.245.
- 2016* Maria A. Spyrou, Rezeda I. Tukhbatova, Michal Feldman, Joanna Drath, Sacha Kacki, Julia Beltrán de Heredia, Susanne Arnold, Airat G. Sitdikov, Dominique Castex, Joachim Wahl, Ilgizar R. Gazimzyanov, Danis K. Nurgaliev, Alexander Herbig, **Kirsten I. Bos**, and Johannes Krause. Historical *Y. pestis* Genomes Reveal the European Black Death as the Source of Ancient and Modern Plague Pandemics. *Cell Host and Microbe*, 19:874-881, dx.doi.org/10.1016/j.chom.2016.05.012.
- 2016* **Kirsten I. Bos**, Alexander Herbig, Jason Sahl, Nicholas Waglechner, Mathieu Fourment, Stephen A. Forrest, Jennifer Klunk, Verena J. Schuenemann, Debi Poinar, Melanie Kuch, G. Brian Golding, Olivier Dutour, Paul Keim, David M. Wagner, Edward C. Holmes, Johannes Krause, and Hendrik N. Poinar. Eighteenth century *Yersinia pestis* genomes reveal the long-term persistence of an historical plague focus. *eLife*, 12994, doi.org/10.7554/eLife.12994.
- 2015* **Kirsten I. Bos**, Günter Jäger, Verena J. Schuenemann, Åshild J. Vågane, Maria A. Spyrou, Alexander Herbig, Kay Nieselt, and Johannes Krause. Parallel detection of ancient pathogens via array-based DNA capture *Phil. Trans. R. Soc. B* **370** (1660) (19 January 2015) doi: 10.1098/rstb.2013.0375.
- 2015 Kelly M. Harkins, Jane E. Buikstra, Tessa Campbell, **Kirsten I. Bos**, Eric D. Johnson, Johannes Krause, and Anne C. Stone. Screening ancient tuberculosis with qPCR: challenges and opportunities *Phil. Trans. R. Soc. B* **370**(1660) (19 January 2015) doi: 10.1098/rstb.2013.0622.

- 2014* **Kirsten I. Bos**, Kelly M. Harkins, Alexander Herbig, Mireia Coscolla, Nico Weber, Iñaki Comas, Stephen A. Forrest, Josephine M. Bryant, Simon R. Harris, Verena J. Schuenemann, Tessa J. Campbell, Kerrtu Majander, Alicia K. Wilbur, Ricardo A. Guichon, Dawnie L. Wolfe Steadman, Della Collins Cook, Stefan Niemann, Marcel A. Behr, Martin Zumarraga, Ricardo Bastida, Daniel Huson, Kay Nieselt, Douglas Young, Julian Parkhill, Jane E. Buikstra, Sebastien Gagneux, Anne C. Stoneř, and Johannes Krauseř. Pre-Columbian Mycobacterial Genomes Reveal Seals as a Source of New World Human Tuberculosis. *Nature*; 514(7523):494-497.
- 2014 Iosif Lazaridis, Nick Patterson, Alissa Mittnik, Gabriel Renaud, Swapan Mallick, Karola Kirsanow, Peter H. Sudmant, Joshua G. Schraiber, Sergi Castellano, Mark Lipson, Bonnie Berger, Christos Economou, Ruth Bollongino, Qiaomei Fu, **Kirsten I. Bos**, ... , Svante Pääbo, Janet Kelso, David Reich, and Johannes Krause. Ancient human genomes suggest three ancestral populations for present-day Europeans. *Nature*; 513(7518):409-413.
- 2014 Alison M. Devault, M.A., G. Brian Golding, Ph.D., Nicholas Waglechner, M.Sc., Jacob M. Enk, M.Sc., Melanie Kuch, M.Sc., Joseph H. Tien, Ph.D., Mang Shi, M.Phil., David N. Fisman, M.D., M.P.H., Anna N. Dhody, M.F.S., Stephen Forrest, M.Sc., **Kirsten I. Bos**, Ph.D., David J.D. Earn, Ph.D., Edward C. Holmes, Ph.D., and Hendrik N. Poinar, Ph.D. Second-Pandemic Strain of *Vibrio cholerae* from the Philadelphia Cholera Outbreak of 1849. *N Engl J Med*; 370:334-340.
- 2013 Verena J. Schuenemann, Pushpendra Singh, Thomas A. Mendum, Ben Krause-Kyora, Günter Jäger, **Kirsten I. Bos**, et al... and Johannes Krause. Genome-Wide Comparison of Medieval and Modern *Mycobacterium leprae*. *Science*; 341(6142):179-183.
- 2013 Qiaomei Fu, Alissa Mittnik, Philip L.F. Johnson, **Kirsten Bos**, Martina Lari, Ruth Bollongino, Chengkai Sun, Liane Giemsch, Ralf Schmitz, Joachim Burger, Anna Maria Ronchitelli, Fabio Martini, Renata G. Cremonesi, Jiřı Svoboda, Peter Bauer, David Caramelli, Sergi Castellano, David Reich, Svante Pääbo and Johannes Krause. A revised timescale for human evolution based on ancient mitochondrial genomes. *Current Biology*; Volume 23, Issue 7: 553-559.

- 2012* **Kirsten I. Bos**, Philip Stevens, Kay Nieselt, Hendrik N. Poinar, Sharon N. DeWitte, and Johannes Krause. *Yersinia pestis*: new evidence for an old infection. *PLOS ONE*; Volume 7, Issue 11, e49803. doi:10.1371/journal.pone.0049803.
- 2011 **Kirsten I. Bos**, Verena J. Schuenemann, G. Brian Golding, Hernan A. Burbano, Nicholas Waglechner, Brian K. Coombes, Joseph B. McPhee, Sharon N. DeWitte, Matthias Meyer, Sarah Schmedes, James Wood, David J. D. Earn, D. Ann Herring, Peter Bauer, Hendrik N. Poinar & Johannes Krause. A draft genome of *Yersinia pestis* from victims of the Black Death. *Nature*; Volume 478:506 – 510. doi:10.1038/nature10549.
- 2011 Schuenemann VJ, **Bos KI**, DeWitte SN, Schmedes S, Jamieson J, Mittnik A, Forrest SA, Coombes B, Wood JW, Earn D, White Wi, Krause, and Poinar HN (2011). Targeted enrichment of ancient pathogens yielding the pPCP1 plasmid of *Yersinia pestis* from victims of the Black Death. *Proceedings of the National Academy of Sciences*; doi/10.1073/pnas.1105107108.
- 2010 John BA Okello, Linda Rodriguez, Debi Poinar, Kirsten Bos, Andrew L. Okwi, Gabriel S Bimenya, Nelson K Sewankambo, Kenneth R Henry, Hendrik N Poinar. Quantitative Assessment of the Sensitivity of Various Commercial Reverse Transcriptases Based on Armored HIV RNA. *PLoS ONE*; Volume 5, Issue 11, e13931. doi:10.1371/journal.pone.0013931.
- 2009 Linda Y. Rutledge, **Kirsten I. Bos**, Robert J. Pearce, Bradley N. White. Genetic and morphometric data from 16th century skull fragments support the eastern wolf as a distinct species from the gray wolf. *Conservation Genetics*; Volume 11, Issue 4:1273-1281
- 2009 Hendrik Poinar, Stuart Fiedel, Christine E. King, Alison M. Devault, **Kirsti Bos**, Melanie Kuch, Regis Debruyne. Commenton "DNA from Pre-Clovis Human Coprolites in Oregon, North America". *Science*; Volume 325 Issue 5937:148.
- 2008 Regis Debruyne, Genevieve Chu, Christine E. King, **Kirsti Bos**, Melanie Kuch, Carsten Schwarz, Paul Szpak, Darren R. Gröcke, Paul Matheus, Grant Zazula, Dale Guthrie, Duane Froese, Bernard Buigues, Christian de Marliave, Clare Flemming, Debi Poinar, Daniel Fisher, John Southon, Alexei N. Tikhonov, Ross D.E. MacPhee and Hendrik N. Poinar. Out of America: Ancient DNA Evidence for a New World Origin of Late Quaternary Woolly Mammoths. *Current Biology*; Volume 18, Issue 17:1320-1326.

Non-Refereed Manuscripts

Marcel Keller, Maria A. Spyrou, Michael McCormick, **Kirsten I. Bos**, Alexander Herbig, and Johannes Krause. Ancient *Yersinia pestis* genomes provide no evidence for the origin of spread of the Justinianic Plague. *bioRxiv*, 819698

A Herbig, F Maixner, **KI Bos**, A Zink, J Krause, DH Huson. MALT: Fast alignment and analysis of metagenomic DNA sequence data applied to the Tyrolean Iceman, *bioRxiv*, 050559.

Manuscripts in preparation

**denotes corresponding author*

*Geographically dispersed zoonotic tuberculosis in pre-contact New World human populations. Åshild J. Vågane, Tanvi P. Honap, Kelly M. Harkins, Michael S. Rosenberg, Karen Giffin, Felipe Cárdenas-Arroyo, Laura Paloma Leguizamón, Judith Arnett, Jane E. Buikstra, Alexander Herbig, Anne C. Stone, Kirsten I. Bos and Johannes Krause.

Published Abstracts/Professional Meeting Presentations

- 2018 Elizabeth A. Nelson, Aditya Kumar Lankalipalli, Maria Spyrou, Åshild Vågane, Alexander Herbig, Tiffany A. Tung, and Kirsten Bos. Tuberculosis and the Decline of the Wari Empire. Talk delivered at the 87th annual meeting of the American Association for Physical Anthropologists, Austin, Texas.
- 2017 Felix M. Key, Ron Hübler, Christina Warriner, **Kirsten I. Bos**, Wolfgang Haak, Johannes Krause, and Alexander Herbig. High-throughput pathogen detection in ancient metagenomic data. Presented at the 2017 meeting for the Society of Molecular Biology and Evolution, Austin, Texas.

- 2017 Allison E. Mann, Susanna Sabin, Kirsten Ziesemer, Krithivasan Sankaranarayanan, Andrew Ozga, Menno Hoogland, Corrine Hoffman, Åshild J. Vågene, James Fellow-Yates, Christopher Read, Alexander Herbig, Johannes Krause, **Kirsten I. Bos**, and Christina Warriner. Differential preservation of endogenous human and microbial DNA in dental calculus and dentin. Poster presented at the 87th annual meeting for the American Association for Physical Anthropology, New Orleans, LA.
- 2017 Åshild J, Vågene, Michael G. Campana, Nelly Robles García, Christina Warriner, Daniel Huson, Noreen Tuross, Alexander Herbig, **Kirsten I. Bos**, and Johannes Krause. Searching for pathogens in the earliest known colonial epidemic burial in Mexico, Teposcolula-Yucundaa. Poster presented at the 87th annual meeting for the American Association for Physical Anthropology, New Orleans, LA.
- 2017 **Kirsten I. Bos**, Åshild J. Vågene, Tanvi Honap, Frank Maixner, Albert Zink, Jane E. Buikstra, Anne C. Stone, Daniel Huson, Alexander Herbig, and Johannes Krause. Needles in haystacks: bacterial profiling and pathogen identification in ancient DNA. Presented at the 44th annual meeting for the Paleopathology Association, New Orleans, LA.
- 2017 **Kirsten I. Bos**, Åshild Vågene, Tanvi Honap, Alexander Herbig, Jane E. Buikstra, Anne C. Stone, and Johannes Krause. Tuberculosis in Past Peruvian Populations. Presented at the 82nd annual meeting of the Society for American Archeology, Vancouver, BC.
- 2017 **Kirsten Bos**, Åshild Vågene, Tanvi Honap, Alexander Herbig, Hane Buikstra, Anne Stone, and Johannes Krause. Zoonotic infections of *Mycobacterium tuberculosis* in the precontact New World. Presented at the One Past Health zoonosis conference in Plön, Germany.
- 2016 **Kirsten I. Bos**, Maria Spyrou, Rezeda I. Tukhbatova, Ilgizar R. Gazimzyanov, Airat G. Sitdikov, Danis K. Nurgaliev, Alexander Herbig, and Johannes Krause. A 14th-century *Yersinia pestis* genome from Tatarstan: tracing the aftermath of the Black Death. Presented at 21st meeting of the European Paleopathology Association, Moscow, Russia
- 2016 **Kirsten I. Bos**, Maria Spyrou, Rezeda Tukhbatova, Joachim Wahl, Alexander Herbig, and Johannes Krause. Tracing the aftermath of the Black Death through analyses of ancient genomes. Presented at the 2016 meeting for the Society of Molecular Biology and Evolution, Gold Coast, Australia.

- 2016 **Kirsten Bos**, Alexander Herbig, Daniel H. Huson, Noreen Tuross and Johannes Krause. Searching for Pathogens in a New World Colonial Epidemic Burial. Presented at the 81st annual meeting for the Society of American Archeology, Orlando, FL.
- 2016 Johannes Krause, Maria A. Spyrou, Michal Feldman, Alexander Herbig and **Kirsten I. Bos**. Genome Analysis of Medieval Yersinia Pestis Suggests an Ancient European Source Population for the Majority Of Modern Plague Strains. Presented at the 81st meeting for the Society of American Archeology, Orlando FL.
- 2015 Johannes Krause, **Kirsten Bos**, Alexander Herbig, Sebastien Gagneux, Jane Buikstra, and Anne C. Stone. Ancient *Mycobacterium tuberculosis* genomes suggest re-adaptation to pre-Columbian human populations. Invited talk presented at the 2015 meeting for the Society for Molecular Biology and Evolution, Vienna, Austria.
- 2015 Maria Spyrou, Åshild Vågane, Luca Bondioli, Alessandra Sperduti, **Kirsten I. Bos**, and Johannes Krause. Investigation of mitochondrial DNA diversity in early medieval Southern Italy. Poster presented at the 2015 meeting for the Society of Molecular Biology and Evolution, Vienna, Austria.
- 2015 Alexander Herbig, Frank Maixner, **Kirsten Bos**, Benjamin Buchfink, Chao Xie, Albert Zink, Johannes Krause, and Daniel Huson. Ultra-fast alignment and analysis of metagenomic DNA sequence data from the Tyrolean Iceman. Poster presented at the 2015 meeting of the Society for Molecular Biology and Evolution, Vienna, Austria.
- 2015 **Kirsten I. Bos**, Kelly M. Harkins, Alexander Herbig, Sebastien Gagneux, Jane E. Buikstra, Anne C. Stone, and Johannes Krause. Mycobacterium tuberculosis genomes from the pre-Columbian New World suggest a marine route of disease transmission. Presented at the 42nd annual meeting of the Paleopathology Association, St. Louis Missouri, United States.
- 2014 **Kirsten I. Bos**, Kelly M. Harkins, Alexander Herbig, Jane E. Buikstra, Sebastien Gagneux, Anne C. Stone, and Johannes Krause. Analyses of *Mycobacterium tuberculosis* genomes from the pre-contact New World using high throughput sequencing. Presented at the 20th Paleopathology Association Meeting, Lund, Sweden.

- 2014 **Kirsten I. Bos**, Kelly M. Harkins, Alexander Herbig, Jane E. Buikstra, Sebastien Gagneux, Anne Stone, and Johannes Krause. A preliminary evaluation of *Mycobacterium tuberculosis* in the pre-contact New World using high throughput sequencing. Presented at the 83rd annual meeting of the American Association for Physical Anthropologists, Calgary, Alberta.
- 2013 **Kirsten I. Bos**, Johannes Krause. Palaeopathology in the era of high throughput sequencing. Presented at the 15th annual conference for the British Association for Biological Anthropology and Osteoarchaeology, York, United Kingdom.
- 2013 **Kirsten I. Bos**, Johannes Krause. Genetic investigations of *Y. pestis* from archaeological populations. Presented at Cold Spring Harbor Asia, Yersinia 11, Suzhou, China.
- 2013 **Kirsten I. Bos**, Johannes Krause. Ancient pathogen DNA: protocols, progress, and possibilities. Presented at the 78th annual meeting for the Society of American Archeology, Honolulu, Hawaii.
- 2013 **Kirsten I. Bos**, Johannes Krause. The evolutionary history of *Yersinia pestis*. Presented at the 82nd annual meeting of the American Association for Physical Anthropologists, Knoxville, Tennessee.
- 2012 **Kirsten I. Bos**, Verena J. Schuenemann, Sharon N. DeWitte, Hendrik N. Poinar, and Johannes Krause. A draft genome of *Yersinia pestis* from victims of the Black Death. Presented at the European Meeting of the Paleopathology Association, Lille, France.
- 2012 **Kirsten I. Bos**, Verena J. Schuenemann, G. Brian Golding, Hernàn A. Burbano, Nicholas Waglechner, Brian K. Coombes, Joseph B. McPhee, Sharon N. DeWitte, Hendrik N. Poinar, and Johannes Krause. A draft genome of *Yersinia pestis* from victims of the Black Death. Presented at the 81st annual meeting of the American Association for Physical Anthropologists, Portland, Oregon.
- 2011 **Bos KI**, Schuenemann VJ, Krause J, and Poinar HN. Fishing for ancient pathogens: reconstruction of the virulence-associated pPCP1 plasmid of *Y. pestis* from victims of the Black Death. Talk presented at the 39th annual meeting for the Canadian Association for Physical Anthropology, Montreal, Q.C.

- 2011 **Kirsten I. Bos**, "Fishing for ancient pathogens: *Yersinia pestis* DNA from victims of the medieval plague in London, England". Talk presented at the "Archéologie des épidémies" Workshop in Bordeaux, France.
- 2009 **Bos KI**, Forrest SA, and Poinar HN "Metagenomics and Ancient Human Disease: efficient targeted retrieval of ancient pathogen DNA for high-throughput sequencing applications". Talk presented at the 37th annual meeting for the Canadian Association for Physical Anthropology, Vancouver B.C.
- 2008 **Bos KI**, DeWitte SN, and Poinar HN. "Metagenomics and disease in past human populations". Talk presented at the 36th conference for the Canadian Association of Physical Anthropology, Hamilton, Ontario.
- 2007 Poinar HN, **Bos KI**, Sobolik K. "Metagenomics in Archaeology: the palaeofaecal record". Talk presented at the 72nd meeting for the Society of American Archaeology, Austin, Texas.
- 2002 Hoppa RD, Pletcher S and **Bos K**. "Mutation Accumulation and Reduced Mortality in Human Populations". Poster presented at the 71st Annual Meeting of the American Association of Physical Anthropologists, Buffalo, New York.

Theses

- 2011 **Bos KI**. Genetic Investigations into the Black Death. Ph.D. thesis. McMaster University, Department of Anthropology.
- 2004 **Bos KI**. Trinitapoli: a preliminary evaluation of the human skeletal material recovered from a Middle Bronze Age burial site in southern Italy. M.A. thesis. McMaster University, Department of Anthropology.

Invited talks

+denotes keynote or plenary lecture

- 2020 "Infections during human evolution". Invited talk delivered at the Akademie der Wissenschaften in Hamburg Infektionen and Gesellschaft conference in Hamburg Germany, October 30th, 2020.
- 2020+ "Genomic reconstructions of ancient zoonotic pathogens". Keynote lecture delivered at the International Symposium on Zoonosis Research in Berlin, Germany, October 16th, 2020.
- 2020 "Evolution of pathogens as revealed through ancient microbial genomes". Invited talk delivered at the Journée François Jacob Paleobiology meeting at the Collège de France in Paris, France, September 28, 2020.
- 2020 "Past zoonotic events revealed from ancient DNA". Invited talk delivered at the annual Veterinary Epidemiology training session in Warendorf, Germany, March 5th, 2020.
- 2019+ "Genomic reconstructions of ancient pathogens". Keynote lecture delivered at the Genome Science conference in Edinburgh, Scotland, September 5, 2019
- 2019+ "What ancient DNA can tell us about zoonoses in the past". Keynote lecture delivered at the EPIZONE meeting, Berlin, Germany, August 26th, 2019
- 2019+ "*Ancient pathogen genomics: and emerging tool for paleopathology*". Keynote lecture delivered at the Paleopathology Association in South America meeting held in São Paulo, Brazil, August 15, 2019-08-21
- 2019 "*Infectious disease history as revealed through ancient pathogens*". Invited talk delivered at the Applied and Environmental Microbiology meeting held in Holyoke College, Massachusetts, July 2019.
- 2019 "*Ancient pathogen genomics of medieval plagues*". Invited talk delivered at the Medieval History conference in Lisbon, Portugal, June 27th, 2019.
- 2019 "*Genomic reconstruction of ancient pathogens*". Invited talk delivered at the Reconstructing the Human Past conference in Heidelberg, Germany, April 3, 2019.

- 2019 *"Genomic analyses of historical pathogens: what ancient DNA can tell us about the diseases of our past"*. Invited talk delivered at the University of Rzeszków, Poland, March 27, 2019.
- 2019 *"Ancient pathogens: making a big deal about (almost) nothing!"* Invited talk delivered at the Visualizing Biological Data (VIZBI) meeting held in Heidelberg, Germany, March 15, 2019.
- 2019 *"Sickness and sedentism: an ecological approach to disease transmission"*. Lecture delivered at the University of Munich, as part of a lecture series in the Department of Archaeology, January 16, 2019.
- 2018+ *"Molecular detection of ancient pathogens in the era of "big data"*. Keynote lecture for the European Paleopathology Meeting, Zagreb, Croatia.
- 2018+ *"Yersinia pestis through the ages: perspectives from ancient DNA"* Keynote lecture for the European *Yersinia pestis* meeting, Jena, Germany.
- 2016 *"Ancient bacterial genomics: what we learn from historical pandemics"*. Invited talk given at the Réunion Interdisciplinaire de Chimiothérapie et Anti-Infectieuse conference in Paris, France, December 12, 2016
- 2016 *"Genomic analyses of historical pathogens"* Invited talk delivered at the European Molecular Biology Laboratory symposium on New Model Systems for Linking Evolution and Ecology, Heidelberg, Germany.
- 2015 *"Genomic analyses of ancient pathogens"* Invited talk delivered at Ancient DNA: A Window to the Past and Future symposium in Thessaloniki, Greece.
- 2015 *"Genomic analyses of historical pathogens"* Invited talk delivered at the 2015 meeting for the European Society for Human Genetics in Glasgow, Scotland, United Kingdom.
- 2015 *"Genomics analyses of historical pathogens"*. Invited talk delivered at the Institute for Evolutionary Biology, University of Zurich, Switzerland.
- 2014 *"The great plagues of Europe and their biological legacies"*. Delivered at the University of Leuven, Belgium.

- 2014 *"Plagues of our ancestors as revealed through ancient DNA"*.
Delivered at the Genetic Genealogy Conference 2014 in Dublin,
Ireland.
- 2014 *"Genomic Investigations of Tuberculosis in the Precontact New
World"*. Delivered at the Institute for Archaeological Sciences,
University of Tuebingen, Germany.
- 2014 *"Reconstructing Ancient Pathogen Genomes from Historical
Bone"*. Invited talk delivered at the 2014 Forensica conference,
Prague, Czech Republic.
- 2014 *"Genetic Investigations into the Black Death"*. Invited public talk
delivered at the Who Do You Think You Are convention, London,
England.
- 2013 *"Ancient pathogen genomics: what we learn from historical
diseases"*. Invited talk delivered at the University of Leiden, the
Netherlands.
- 2013 *"A draft genome of Yersinia pestis from victims of the Black
Death"*. Invited public talk delivered at the European Molecular
Biology Laboratory (EMBL), Heidelberg, Germany.
- 2013 *"A draft genome of Yersinia pestis from victims of the Black
Death"*. Invited public talk delivered at the Institute of Forensic
Medicine, Bern, Switzerland.
- 2012+ *"Human health in the past as revealed through the genomes of
ancient pathogens"*. Plenary lecture delivered at the McMaster
Life Sciences Interdisciplinary Research Symposium.
- 2011 *"Fishing for ancient pathogens and the genome of the Black
Death"*. Talk delivered at the Hamilton Science Cafe.

Internal Symposia presentations

- 2007 McMaster Ancient DNA Centre laboratory seminar: *"Molecular
approaches to ancient pathogens: the case of the Black Death"*
- 2006 McMaster University Anthropology departmental seminar:
*"Unlocking the bowels of history: the secrets that coprolites hold
with special reference to the peopling of the Americas"*

Teaching

- 2020 Guest interviewee for "Sick: 10,000 years of health and disease", ANTHRO 1270 at Harvard University
- 2019 "Genomic reconstructions of ancient pathogens". Lecture delivered as part the "Human History" lecture series for the Master's program "Evolution, Ecology, and Systematics" at Friedrich Schiller Universität, Jena.
- 2018 "Molecular Detection of Ancient Pathogens in the era of Big Data". Lecture delivered at the Host and Microbes Master's course, École Normale Supérieure (ENS) Lyon, France
- 2017 "*Genomic Analyses of Historical Pathogens*". Invited graduate lecture delivered at the Host and Microbe Master's course, École Normale Supérieure (ENS), Lyon, France
- 2016 "*Genomic Analyses of Ancient Pathogens*". Invited graduate lecture given at the BioSciences Masters Symposium at the École Normale Supérieure (ENS), Lyon, France
- 2015 Special topics in Palaeogenetics, doctoral level course, University of Tuebingen
- 2015 "*Ancient pathogen genomics*". Invited lecture delivered as part of the European course on Comparative Genomics, École Normale Supérieure (ENS), Lyon, France
- 2011 "*Genetic Investigations into the Black Death*" McMaster University undergraduate level course lecture, ANTH 2U03.
- 2010 "*Plagues in Ancient Populations*", talk delivered for the McMaster University Medical School.
- 2009 "*Secrets of 'Secrets of the Dead'*", McMaster University undergraduate lecture level course lecture, ANTH 2E03.
- 2009 "*The Black Death from a Molecular Perspective*", McMaster University undergraduate level course lecture, ANTH 2U03.
- 2009 "*Medieval Mysteries meet Modern Technologies*", McMaster University undergraduate level course lecture, ANTH 2U03.
- 2009 "*Medieval Mysteries meet Modern Technologies: the case of the Black Death*", McMaster University Alumni Association.

- 2008 "Ancient DNA and disease", McMaster University undergraduate level course lecture, ANTH 4J03.
- 2006 "The anthropology of health and the contributions of ancient DNA data", McMaster University graduate level course lecture.

Mentoring Experience

Informal supervisor to the following doctoral candidates:

- Åshild Vågane (University of Tuebingen, 2018)
 Maria Spyrou (University of Tuebingen, 2018)
 Elizabeth Nelson (University of Tuebingen)
 Cody Parker (Friedrich Schiller Universität Jena)
 Susanna Sabin (Friedrich Schiller Universität Jena, 2019)
 Karen Giffin (Friedrich Schiller Universität Jena)

Advisor and thesis reviewer to the following Master's student:

- Susanna Sabin (University of Tuebingen, 2016)

External thesis reviewer and oral defense examiner for the following doctoral candidate:

- Thomas Collin (University College Dublin, 2019)

Public Outreach

- 2018 **Kirsten I. Bos.** Digging for Ancient Pathogens. Invited contribution to Cell "Voices", CELL 172(6):1155
- 2017 Maria A. Spyrou and **Kirsten I. Bos.** Tracking Ancient Plagues. Invited article for Natural History Magazine. September 2017.
- 2017 **Kirsten I. Bos,** Elizabeth Nelson, and Maria Spyrou. "Identifying plague through ancient DNA analysis". In Crossrail Archaeology. The New Churchyard: from Moorfields Marsh to Bethlem Burial Ground, Brookers Row, and Liverpool Street. In press.
- 2014 **Kirsten I. Bos.** "Tales from a plague pit: what caused the Black Death?". Article written for the Science in School journal issued by the European Molecular Biology Laboratory.
- 2013 "The Mystery of Rome's X Tomb" filming for BBC documentary on a Roman catacomb, television programme aired July 2013.

2013 "Secrets in the Bones: the Hunt for the Black Death Killer"
filming for CBC programme special edition of The Nature of
Things, aired January 16, 2014

Peer Reviewer for:

Science

Molecular Biology and Evolution

PNAS

Science Advances

Nature Ecology and Evolution

PLOS pathogens

Nature Communications

Giga Science

Proceedings of the Royal Society Series B

Philosophical Transactions of the Royal Society b

International Journal of Paleopathology

American Journal of Physical Anthropology

European Research Council Consolidator Grants

Deutsche Forschungsgemeinschaft Grants (DFG)

Leaky Grants

Marsden Grants (New Zealand)

Scientific Reports

PLOS ONE

Clinical Microbiology and Infection

Journal of Microbiology

Trends in Evolution and Ecology

Molecular Ecology Resources

International Journal of Osteoarchaeology

Nexus (McMaster University)

Service

2018 Organizational Committee for the 8th International Conference on Biomolecular Archaeology (ISBA)

2014 AERES departmental review, AMIS, Anthropologie Moléculaire et Imagerie de Synthèse, Toulouse, France

2009 – 2011 Hiring committee, Guelph Symphony Orchestra Artistic Director

2008 – 2011 Guelph Symphony Orchestra Board Member (player representative)

2007 – 2010 Joint Health and Safety Committee member for Science, McMaster University

2009 Hiring committee for tier 1 Canada Research Chair in skeletal biology, McMaster University

2008 Department of Anthropology Graduate Student Representative

2003 Forensic consultant, City of Hamilton Police Dept.

Professional organisations:

American Association of Physical Anthropologists

Paleopathology Association

Society for American Archeology