

CURRICULUM VITAE

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

Part A. PERSONAL INFORMATION		CV date	8/04/2023
First name	Colin		
Family name	Smith		
Gender (*)	Male	Birth date (dd/mm/yyyy)	
Social Security, Passport, ID number			
e-mail	cismith@ubu.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)	0000-0001-5901-8780		

(*) Mandatory

A.1. Current position

Position	Senior Research Fellow (Beatriz Galindo)		
Initial date	Feb 2021		
Institution	Universidad de Burgos		
Department/Center	History, Geography and Communication / Faculty of Humanities	Laboratorio de Evolución Humana	
Country	Spain	Teleph. number	947259545
Key words	Stable Isotopes, Taphonomy, Amino Acid, Biomolecular Archaeology		

A.2. Previous positions (research activity interruptions, see call)

Period	Position/Institution/Country/Interruption cause
2014-2020	Associate Professor/ La Trobe University/ Australia
2010-2014	ARC Future Fellow/ La Trobe University/ Australia
2009-2010	Postdoctoral Researcher/ Max Planck Institute for Evolutionary Anthropology/ Germany
2007-2009	Marie Curie Research Fellow (FP6)/ Max Planck Institute for Evolutionary Anthropology/ Germany
2005-2006	Postdoctoral research associate/ University of Durham/ UK
2004-2005	Postdoctoral research assistant/ University of Uppsala/ University of Stockholm/ Sweden.
2002-2004	Marie Curie Research Fellow (FP5)/ Museo Nacional de Ciencias Naturales (CSIC)/ Spain.

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD	University of Newcastle-upon-Tyne	2002
MSc	University of Huddersfield	1996
BSc	Bradford University	1994

Part B. CV SUMMARY

I am a biomolecular archaeologist with interests in stable isotopes, bone diagenesis, ancient proteins and DNA. I am interested in developing and pioneering novel techniques for dietary and palaeoenvironmental reconstruction using stable isotopes. I am also currently interested in dietary and genetic transitions in later prehistory, especially in Europe. **I have held research roles at the Natural History Museum in Spain, Stockholm University and Uppsala Universities in Sweden, Durham**



University in the UK, and the Max Planck Institute for Evolutionary Anthropology (MPI-EVA) and as an ARC Future Fellow at La Trobe University, where I directed the La Trobe Molecular Archaeology Laboratory.

Through my research I have made a number of significant contributions to the field of biomolecular archaeology, ancient biomolecules and stable isotope analysis. One strand of my research has been in archaeological bone chemistry and improving our understanding of how archaeological and fossil bones degrade or are preserved. Through my own research and in collaboration with colleagues **I have been able to contribute to a body of work that represents some of the most important publications on bone diagenesis, published in esteemed journals, *Archaeometry* and *Journal of Archaeological Science*.** My work has emphasized the use of measuring diagenetic parameters in defining the state of preservation of bone. **Published between 2002-2007, this work is widely cited (Google Scholar: 9 Papers with >2100 citations).** Work that I continued when I first moved to Spain to work at the Natural History Museum.

A related aspect to this is my research on ancient DNA studies including preservation of ancient DNA and applications. Along with my PhD supervisor (Prof. Matthew Collins) I developed the ‘Thermal Age’ model for ancient DNA degradation. This work is widely cited (Google Scholar: 2 papers with 580 citations) and adopted in ancient DNA studies and **continues to be regarded as a useful authentication indicator by the ancient DNA community. My own work and collaborations with ancient DNA researchers have also led to publications in prestigious journals such as *Nature*, *Science*, *PNAS* and the *Journal of Human Evolution*.**

More recently I have focused my research on **stable isotope analysis of ancient and modern proteins, using Liquid Chromatography-Isotope ratio Mass Spectrometry (LC-IRMS).** My initial research, by necessity, has been in developing a stable chromatographic technique for the analysis of carbon isotopes of amino acids that has since been applied by other authors. **One of my main aims has been to develop a diverse range of applications so that the technique can be applied to different samples and fields of study.** So far this has been applied to archaeological bone protein, modern coral proteins, keratin from mummy hair, chitinous stygofaunal exoskeletons and organic matter trapped in stalagmites, having an impact in various disciplines such as oceanography, geochemistry, ecology and archaeology. This work has produced 15 publications with more than 500 citations (Google Scholar).

My research is well cited for my field (over 5700 citations, Google Scholar) and continues to be so, with over 400 citations each year for the last 7 years (Google Scholar), demonstrating the relevance and impact of my work. I am in the top 20 most cited people who have self-identified as researching archaeological science on Google scholar, with an H-index of 27 (Scopus). In Spain my research output has been recognized by the award of three sexenios.

Part C. RELEVANT MERITS

C.1. Publications

- 1) Mora, A. ^(CA), Pacheco, A., Roberts, C. A. & **Smith, C.** (2021) Palaeopathology and amino acid $\delta^{13}\text{C}$ analysis: Investigating pre-Columbian individuals with tuberculosis at Pica 8, northern Chile (1050-500 BP). *Journal of Archaeological Science*, 129 <https://doi.org/10.1016/j.jas.2021.105367> (Author: 4/4)
- 2) Saccò, M. ^(CA), Blyth, A., Humphreys, W. H., Kuhl, A., Mazumder, D., **Smith C. I.** & Grice., K. (2019) Elucidating stygofaunal trophic web interactions via isotope ecology. *PLoS One*, 14 (10) Article number e0223982, <https://doi.org/10.1371/journal.pone.0223982> (Author: 6/7)
- 3) Roberts, G.L. ^(CA), Towers, J., Gagan, M. K., Cosgrove, R. & **Smith, C.** (2019) Isotopic variation within Tasmanian bare-nosed wombat tooth enamel: Implications for archaeological and palaeoecological research. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 523, 97-115. <https://doi.org/10.1016/j.palaeo.2019.03.003> (Author: 5/5)



- 4) Valdiosera, C.^(CA), Günther, T.^(CA), Vera-Rodríguez, J. C.^(CA),& Jakobsson, M.^(CA). (2018) At the far end of prehistoric Eurasian migrations – demographic changes during four millennia of Iberian biomolecular prehistory. *Proceedings of the National Academy of Science (USA)*, 115 (13) 3428-3433. (19/20) DOI: 10.1073/pnas.1717762115 (Author: 19/20)
- 5) Mora, A.^(CA), Pacheco, A., Roberts, C. and **Smith C.**, (2018) Pica 8: Refining dietary reconstruction through amino acid $\delta^{13}\text{C}$ analysis of tendon collagen and hair keratin. *Journal of Archaeological Science*, 93, 94-109. <https://doi.org/10.1016/j.jas.2018.03.002> (Author: 4/4)
- 6) Blyth, A. J.^(CA), **Smith, C.** & Drysdale R. N. (2013). A new perspective on the $\delta^{13}\text{C}$ signal preserved in speleothems using LC-IRMS analysis of bulk organic matter and compound specific stable isotope analysis. *Quaternary Science Reviews*, **75**, 143-149. (Author: 2/3)
- 7) **Smith, C. I.**^(CA), Fuller, B. T., Choy, K., Richards, M. P. (2009). A three-phase liquid chromatographic method for $\delta^{13}\text{C}$ analysis of amino acids from biological protein hydrolysates using LC-IRMS. *Analytical Biochemistry*, **390**, 165-172. <https://doi.org/10.1016/j.ab.2009.04.014> (Author: 1/4)
- 8) Richards, M.^(CA), Harvati, K., Grimes, V., **Smith, C.**, Smith, T., Hublin, J-J., Karkanas, P. & Panagopoulou, E. (2008). Strontium isotope evidence of Neanderthal mobility at the site of Lakonis, Greece using laser-ablation PIMMS. *Journal of Archaeological Science*, **35**, 1251-1256. <https://doi.org/10.1016/j.jas.2007.08.018> (Author:4/8)
- 9) **Smith, C. I.**^(CA), Nielsen-Marsh, C. M., Jans, M. M. E. & Collins, M. J. (2007). Bone diagenesis in the European Holocene I: Patterns and Mechanisms. *Journal of Archaeological Science*, **34**, 1485-1493. <https://doi.org/10.1016/j.jas.2006.11.006> (Author: 1/4)
- 10) **Smith, C. I.**, Chamberlain, A. T., Riley, M. S., Cooper, A., Stringer, C. B. & Collins, M. J.^(CA) (2001). Neanderthal DNA: Not just old but old and cold? *Nature*, **410**, 771-772. (1/6) <https://doi.org/10.1038/35071177> (Author: 1/6)

C.2. Congress

The following includes first author oral presentations at conferences only. Keynote presentations are noted.

- 1) **Colin Smith**, Jillian Garvey, Alice Mora, *Investigating Late Quaternary palaeoenvironment in the Central Murray River Valley using amino acid stable isotopic data from freshwater mussel shells (Alathyria jacksoni)*, UK Archaeological Science Conference, University of Aberdeen, Aberdeen, UK, 2022
- 2) **Colin Smith**, *Investigating Ancient Proteins Using LC-IRMS*, Gordon Research Conference on Scientific Methods in Cultural Heritage Research, Probing Hierarchically Complex Historical Materials and Their Modes of Characterization and Alteration, Newry, ME, USA, 2016
- 3) **Colin Smith, Keynote: LC-IRMS of Amino-acids and Archaeological Application**, 12th Australian Environmental Isotope Conference, Perth, Australia, 2013
- 4) **Colin Smith**, Alice Mora, Benjamin Fuller, Olaf Nehlich, Mike Richards, *Investigating archaeological bone collagen at the amino acid level using liquid chromatography-isotope ratio mass spectrometry*, UK Archaeological Science, Reading, UK, 2011. **Also session Chair:** Mobility, Migration and Culture Contact 1
- 5) **Colin Smith, Keynote: Ancient proteins in palaeontology: more than just bone collagen**, Conference on Australasian Vertebrate Evolution Palaeontology and Systematics, Perth, Australia, 2011



- 6) **Colin Smith**, Olaf Nehlich, Vaughan Grimes Holley Martlew, Yannis Tzedakis, Philip Betancourt, Mike Richards, *A multi-isotopic approach to mobility and diet in Minoan Crete*, Society for American Archaeology, Vancouver, Canada, 2008.
- 7) **Colin Smith**, Christina Nielsen-Marsh, Matthew Collins, Miranda Jans, *What can dead Europeans tell us about bone diagenesis?*, Bone Diagenesis IV, Albarracin, Spain, 2000.

C.3. Research projects

My total research funding amounts to (~€1.85M), unless otherwise stated I was PI or CoPI on all of these grants.

- 1) Colin Smith (**Researcher/Stable Isotopes**), *Geology, Geochronology and Palaeobiology of the Pleistocene sites of the Sierra de Atapuerca, VIII*. PID2021-122355NB-C31, Ministerio de Ciencia e Innovación. Universidad Complutense de Madrid. (€330K), 2022-2025.
- 2) Colin Smith (**PI**), *Improving Molecular Stable Isotope fingerprinting of solid, liquid and gaseous samples*. Subprograma Estatal de Infraestructuras de Investigación y Equipamiento Científico-Técnico (Plan Estatal I+D+I 2017-2020) (EQC2021-007637-P), University of Burgos, 2021, **€65,000**
- 3) Colin Smith (**PI**), Beatriz Galindo Fellowship (BGS220-461AA-69201), University of Burgos, 2021-2025, **€360,000**
- 4) **Co PIs**: Cosgrove, Dr Richard F; **Smith, Dr Colin**; Co Investigators: Roebroeks, Prof Wil; Pike-Tay, Prof Anne, *Forty-two degrees of latitude: comparative archaeologies of southwest Tasmania and southwest France during the last Ice Age*. Australian Research Council Discovery Project (DP120100580), La Trobe University, 2012-2015, **AUS\$232,500**
- 5) Colin Smith (**PI**), *Molecular Archaeology: Carbon isotope analysis of amino acids as a means to investigate diets, physiology, metabolism and palaeoenvironment*, Australian Research Council Future Fellowship (FT 0992258), La Trobe University, 2010-2014, **AUS\$683,000**
- 6) Colin Smith (**PI**), *Tracking Minoan mobility using a multi-isotopic approach*, Marie Curie Research Fellowship (FP6 MEIF-CT-2006-041074), MPI-EVA -Leipzig, 2007-2009, **€203,913**
- 7) Colin Smith (**PI**), *Biomolecules and bone taphonomy of the earliest fossil Europeans*. Marie Curie Research Fellowship (FP5 785 HPMF-CT-2002 01605), Museo Nacional de Ciencias Naturales (CSIC), 2002-2004 **€119,408**

C.4. Contracts, technological or transfer merits

I am the project coordinator for the University of Burgos' participation in the European Horizon Twinning grant "Nurturing Heritage Science with Novel Bioarchaeological Methods in the Eastern Baltics" *Paleomix*. HORIZON-WIDERA-2021-ACCESS-03, (€1.3M) **2023-2025** <https://cordis.europa.eu/project/id/101079396>. The Twinning exercise consolidates the research and innovation capabilities of the internationally acknowledged research centres – BioArCh (University of York, UK) and GLOBE Institute: Evo and Eco Genomics Sections (University of Copenhagen, DK) and Laboratory of Human Evolution, isoTOPIK Lab (University of Burgos, ES) – to the Coordinator, University of Tartu (EE), allowing the establishment of a dedicated Research-Innovation (R&I) Hub on Tangible Heritage Studies.

The project will train students and staff from Estonia in best practice of scientific management and laboratory technical skills effecting transfer of knowledge from the other centres of excellence to Estonia and includes a small collaborative research project. I am on the steering committee for the project, leading input on how compound specific isotope measurements are made at Burgos (especially LC-IRMS and GC-IRMS) and management and transferable skills.