**Project Title**  
The application of sedaDNA to landscape archaeology

**Host University**  
University of Warwick

**Supervisory team**  
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**Project Highlights:**

- The opportunity to establish a methodology for sedimentary DNA (sedaDNA) as a viable technique for landscape archaeological investigations
- The opportunity to assist in the study of a potentially new class of monument associated with the “super” henge at Durrington Walls
- The potential to add significantly to our knowledge of the World Heritage landscape at Stonehenge

**Overview:**

The application of sedaDNA within landscape archaeology is a largely untested method. The current application provides an opportunity to consider sedaDNA methodology, against a series of proxy palaeoenvironmental methods, within a strategic and high profile project.

The Stonehenge Hidden Landscapes Project undertook one of the largest terrestrial multi-sensor, archaeo-geophysical surveys in Britain. Covering c. 10 square kilometres around one of Britain’s iconic archaeological monuments, this survey has generated thousands of potential archaeologic features and these have been described in a series of articles and are currently being prepared for a comprehensive publication. Whilst most features identified are interpretable or conform to known comparators several exceptional features remain unexplained and are, potentially of considerable importance. These include a series of massive geophysical anomalies related to one of the largest monuments in the region – the Durrington Wall Henge.
Figure 1 The Stonehenge Hidden Landscapes survey area.
Initially interpreted as modern dewponds, a recent excavation identified 3 similar anomalies and interpreted these as, potentially, natural sinkholes with prehistoric fills. Further research identified no fewer than 15 similar features with a distribution essentially circling the later Neolithic Henge. These anomalies, and their suggestive distribution, were of sufficient interest to mount a separate exploratory campaign of high-resolution survey and coring proving that the magnetic anomalies represent pits 18 metres diameter and up to 4.8 metres deep. Coring also suggests that the position of some of these monuments on the Avon river terraces may provide conditions to test the boundaries of sedaDNA applications, whilst also seeking to assess the function of these peculiar, massive archaeological features.

**Methodology:**

The proposed programme of work will enhance and extend our knowledge of these massive features and will include re-survey of all available features and coring across a series of features for palaeoenvironmental study and a broader dating programme. It is also intended to work within the landscape, and the Avon river terraces specifically, to provide a broader context to data from archaeological features. The PhD candidate will retrieve sedaDNA from samples of cores to assess taphonomy in the context of the monuments, and based on these findings determine to what extent sedaDNA can reveal about them in terms of their use and the depositional environment. Ancient DNA techniques for sedaDNA developed at Warwick will be followed using dedicated ancient DNA facilities and a world class research group. Next generation sequencing will be applied, combined with bioinformatic protocols to analyse data.

**Training and skills:**

Students will be trained in ancient DNA techniques, next generation sequencing techniques as well as computer programming skills required to analyse data. Students will be awarded CENTA2 Training Credits (CTCs) for participation in CENTA2-provided and ‘free choice’ external training. One CTC equates to 1/2 day session and students must accrue 100 CTCs across the three years of their PhD.

**Partners and collaboration:**

Dr Martin Bates, University of Wales Trinity Saint David

Dr Richard Bates, University of St Andrews

Dr Christopher Gaffney University of Bradford

Professor Vincent Gaffney, University of Bradford

Mr Eamonn Baldwin, University of Birmingham

**Possible timeline:**
Year 1: Initial data generation from preliminary coring. SedaDNA extraction from preliminary samples, generation of ancient DNA sequence. Basic taphonomic profiling.

Year 2: Secondary coring mission. Responsive to initial data generation.

Year 3: Large scale data analysis and publication of findings.

Further reading:

Publications:


*Putting Stonehenge in its place*. Scientific American. March 2nd 2011.


*Reports held by Historic England, the National Trust and Wiltshire Historic Environment Record*


**Stonehenge Hidden Landscapes Project 2012 Interim Geophysical Survey Report Field Season 2 2011–2012.** (Unpublished) Interim report for the National Trust and English Heritage, University of Birmingham

**Stonehenge Hidden Landscapes Project 2013 Interim Geophysical Survey Report Field Season 3 2012–2013.** (Unpublished) Interim report for the National Trust and English Heritage, University of Birmingham

Stonehenge Hidden Landscapes Project: Lesser Cursus, Wiltshire – Section 42 report of geophysical survey, April 2012

Stonehenge Hidden Landscapes Project: Cursus Barrow Ridge, Wiltshire – Section 42 report of geophysical survey, September 2012


Further details:

For further information about this project please contact Prof. Robin Allaby, School of Life Sciences, R.G.Allaby@warwick.ac.uk