# Unlocking Historical and Molecular Archives

## Rendicontazione

Informazioni relative al progetto

**PALIMPSEST**

ID dell'accordo di sovvenzione: 299101

Progetto chiuso

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UNIVERSITY OF YORK
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## Questo progetto è apparso in...

# Final Report Summary - PALIMPSEST (Unlocking Historical and Molecular Archives)

Parchment is the medium of medieval Europe. Beyond the message its carries in the text, the animal skin itself holds a wealth of untapped information. Codicologists seek to study the book as a physical, cultural artefact, focusing on the materials used in its manufacture, not least the parchment pages. Questions relating to the number and type of animal skins used in manuscript production over the centuries have not only codiciological but zooarchaelogical implications. Therefore knowing the animal origin of a particular parchment can add a deeper level of understanding to the manuscript, but this has often proved difficult to decipher. Until now animal species identification of parchment has only been possible by morphological analysis of follicle patterns which is often inconclusive, leading to speculation and unresolved debate. PALIMPSEST has given me the opportunity to develop an innovative non-destructive method for parchment analysis, through mass spectrometry of minute quantities of collagen, that provides both confident species identifications as well as invaluable data on parchment ‘quality’ and methods of production.

The non-destructive sampling technique was developed thanks to close collaboration with conservation departments and has been met with widespread approval. Using materials compatible with standard surface conservation treatments we were able to make use of the residue produced as a result of cleaning, to extract minute amounts of collagen that allow us to determine the species of animal used to make the parchment. The simple procedure requires no specialist training and puts the sampling in the hands of the conservators and curators who handle these objects on a daily basis.

The non-destructive nature of the methodology has given us unprecedented access to libraries and archives and allowed us to start to reveal hidden stories. During the two years that PALIMPSEST has been running I have been able to analyse in excess of 1000 documents spanning 3 continents and over 1400 years.

Having analysed such a large dataset I have been able to assess the geographic variability of animals used in the production of parchment. I have also been able to look at the selection of animals for use in different types of documents (e.g. religious codices vs legal deeds). In addition to the species of animal used we have also developed a method to analyse the quality of the parchment sample. We can evaluate a

specific type of damage that occurs in the collagen molecule related to the quality and method of production of the parchment (i.e. time exposed to lime for dehairing) thus giving us insight into changing manufacturing processes. This discovery, initiated during the course of this project, will be further developed during a British Academy Postdoctoral Fellowship that I have been awarded, made possible by the work of PALIMPSEST.

Apart from the obvious application to manuscript studies, this project has sparked interest in a variety of different areas including genetics, rare breed organisations, economic historians and modern day parchment artisans. The potential wealth of untapped data concealed in these preserved skins has been revived as we are now in a technological position to examine and question the data that can be obtained. We are now able to tackle questions relating to livestock economies, technological advances in parchment production, early evidence for selective breeding and the impact of the introduction of competitive mediums (i.e. paper). Initial trends have been observed in specific data set but much larger and comparative sample set will be needed in the future to make further conclusions. Bringing together the expertise from the scientific, humanistic and conservation communities has made this project a pioneer in multidisciplinary research and added greater depth to the project and its ongoing research.

The project has had a large impact both nationally and internationally establishing a collaborative network with partners across Europe and the US counting Cambridge University, the John Rylands Library, the Royal Library in Copenhagen, the University of Pennsylvania, the Morgan Library, Yale and the Beinecke Library among them. The rich collections these institutions hold allow us to give a more complete picture of parchment use through the middle ages.

In addition to libraries we have relied heavily on regional archives in the UK who have vast holdings of parchment in the form of legal deeds and charters. Given that the majority of these document will be of local production it highlights the importance and need for archive research as the knowledge of production site adds value to the molecular data obtained. Archives can therefore play a key role in promoting the need to preserve parchment documents as not only historic objects but biomolecular reservoirs.

The concept of using parchment as a bioarchaeological resource has also enabled various outreach opportunities with school children, bringing together the notion of science and humanities as collaborative areas of research and engaging children with the idea of multidisciplinary careers.

Not only has the project generated a wealth of new data but it has also produced a novel non-destructive sampling technique (patent pending) with the possibility of numerous additional applications.

PALIMPSEST is not the end but rather only the beginning of a new stage in manuscript studies, it has introduced the concept of biomolecular codicology and opened the field to further analysis and interest from multidisciplinary perspectives.

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