

## FIXLAB

### Dating and Material Characterization of Artworks and Archaeological and Paleontological objects.

#### Description

The laboratory for the dating and material characterization of heritage objects, including archaeological and paleontological materials, aims to globally study issues related to the knowledge of cultural activities based on the information that can be obtained from their material characteristics including composition, structure and, singularly, the temporal location through dating.

Thus, the purpose is to study sites as a whole or collections of works related to each other, determining the material characteristics that contribute, together with the rest of the information available from other perspectives, to understand the cultural or evolutionary fact of which they are testimony.

Studies of sets whose potential age is between contemporary and 30,000 years are proposed.

For this study, most of the atomic, molecular, and chromatographic analysis techniques are available, which can be optimized according to the nature of the samples and also the type of information needed. A mobile X-ray Fluorescence team is also available. Dating can be based on radioactive methods or other stable characteristics.

#### Fields of application

Cultural heritage, archaeology and paleontology  
Painting, Sculptures, Manuscripts and  
archaeological and paleontological remains

#### Materials

inorganic  
organic

#### Equipment

Most instrumental analysis techniques: atomic, molecular, chromatographic. Alpha and beta emitter detectors. Microscopes and portable X-ray fluorescence equipment.

#### Potential Results

The material aspects of heritage objects include information about their origin and vicissitudes.

The analysis of the objects (including dating) will contribute to the knowledge of their composition and structure. The subsequent discussion of these results and their integration into the whole study on the site or set of works will allow progress in the global knowledge of the investigated fact.

#### References

- Magkanas, G.; Bagán, H.; Sistach, M.C.; García, J.F.  
*Artomics: A holistic approach to the study of artworks integrating their compositional and formal characteristics. Application on the Liber Feudorum Maior*  
Microchemical Journal, 185-art.num. 108276 (2022).
- Torralba, I.; Bagán, H.; Esisenhofer, J.; Tarancón, A.; Garcia, J.F.  
*Benin sculptures dating: Contribution of scintillation techniques to the restitution of cultural heritage objects.*

- Lluch, E.; Barrera, J.; Tarancón, A.; Bagán H.; García, J.F.  
*Analysis of  $^{210}\text{Pb}$  in water samples with plastic scintillation resins.*  
Analytical Chimica Acta 94', 38-45 (2016)
- Bischoff, J.L; Ludwing, K.R.; García, J.F.; Carbonell, E.; Vaquero, M.; Stafford, T.W.; Jull, A.J.T.  
*Dating of Basal Aurignacian at Abric Romani (Catalunya, Spain) by Radiocarbon and Uranium-Series*  
Journal of Archaeological Science 21, p.541-551 (1994)

### Requisites/needs for the service

- Discussion of the problem
- Access to objects/Samples

### Provider

Depart. Chemical Engineering and Analytical Chemistry.  
Universitat de Barcelona.  
C/ Martí I Franqués 1-10  
08009 Barcelona

Contact:

José F. Garcia, jfgarcia@ub.edu  
+34 934033702