



A multimodal approach to the study of human-derived materials in contemporary artwork

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Incorporation of unconventional, biological-related media in contemporary works of art presents novel challenges for analysis and degradation studies. The M+ Museum collection includes many objects comprised of biological materials, ranging from human fat and taxidermized bats to more commonly employed artist materials such as silk, paper, and wood. One such object, Civilization Pillar (Fig. 1), is a 3.46-meter-tall sculpture composed of a semi-translucent, waxy material derived from human fat collected from over 500 individuals via liposuction, according to the artists [1]. An accumulation of a viscous, sticky exudate at the pillar base prompted the investigation into its material profile. While there are numerous studies on analysis of animal fats and waxes in archaeological objects [2-4], there is a notable lack of research on the study of human fats in contemporary artwork to our knowledge. Thus, the focus of this work is to develop a multi-modal investigation in the original material and degradation product characterization.

ATR-FTIR investigations have been conducted on the collected exudate and the two types of wax-like repairing materials (hard and soft) provided by the artists. The soft material was previously applied by conservators during the installation of the object to fill in the gap between the pillar and the supporting metal base and in subsequent conservation treatment - for example, those areas where visitors have touched the object and created fingerprint impressions and indentations on the object's surface. Both the hard and soft repairing materials exhibited peaks in the carbonyl stretching region in their ATR-FTIR spectra, indicating the presence of ester and fatty acids. However, their profiles in the fingerprint region were distinct, while the spectrum of the exudate displayed greater similarity to that of the hard repairing material. This suggests that the hard repairing material accounts for a higher proportion of this degradation product than the soft one, despite only the soft repairing material has been applied on the pillar. This finding is significant and warrants further study of the pillar's inner material to analyze its contribution to the exudate production. As an ongoing project, sampling and analysis of the inner material will be carried out in the near future.

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In addition, chromatography coupled with mass spectrometry will be employed to differentiate the fat and wax present in the collected samples with greater precision. Proteomics and genomics will be utilized to gain a more comprehensive understanding of the artwork's materiality, cultural context, social significance, and ethical considerations. The findings of this study will have important implications for the conservation and preservation of contemporary artworks containing fat and wax components, providing a foundation for further research in this area.



Fig. 1: (Left) Civilization Pillar on display in the M+ Sigg Collection: From Revolution to Globalization in the M+ Museum, and (Right) close-up photo of the pillar covered in slabs of fat-and-wax materials.

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