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Innovative approaches for immunodetection of proteic binders in art

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Abstract

The characterization and identification of the proteinaceous compounds in a complex and multi-layered painting is crucial for studying the technique used by the artist and for conservation and restoration purposes. These organic compounds, such as animal glues, milk and egg, have a particular importance since they are widely used as binders and adhesives in paintings. Proteins are typically detected by methods like chromatographic and proteomic techniques. However, the immunodetection approach shows to be a powerful method in protein analysis. In this study immunologic techniques, based on enzyme-linked immunosorbent assay (ELISA), were used in order to identify different proteic binders used in easel paintings. The methodology based on indirect ELISA allows the detection of the target antigen in paint models microsamples. These approach is very promising with regard to the possibility of apply these methodology in the detection of proteinaceous binders in real samples.

1. Introduction

Paintings are an expression of art widely used since antiquity. Its techniques and all associated materials have evolved from cave art to contemporary paintings [1].

Mural or easel paintings contain a diversity of components, such as support materials, emulsifiers and binding agents that are easily degraded by microorganisms causing structural and aesthetic damage. This interaction leads to discoloration, stains or biofilms on the painting surface, degradation of the support and adhesive polymers, resulting in cracking and detachment of the layers ink [2-4]. The binding materials used are