



Università degli Studi di Napoli Federico II

PhD in Biotechnology - 35th cycle

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**Green Chemistry and Circular Economy as
alternative strategies for the traditional leather
manufacturing industry**

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Leather processing is an issue of extreme interest in the field of "circular economy"[1]: it mainly consists in activities of recovery and enhancement of a by-product of the food industry (raw animal skin that comes from slaughter). Today leather industry suffers of a negative ecological impact due to a heavy environmental pollution caused by tannery wastes [2]. There is, therefore, an escalating ecological apprehension concerning tanneries due to the production of large amounts of potentially toxic wastewaters containing both trivalent and hexavalent Chromium [3]. From this perspective, it is evident the necessity to explore innovative and eco-sustainable alternative methods of leather processing, in particular, by developing new approaches of finishing that contributes to add new value to the products or decrease its related ecological impact.

The present PhD project aims to develop innovative strategies for the recovery, extraction, and functionalization of collagen resulting from tannery solid wastes in order to integrate this material as a valuable reagent into the finishing processes; in parallel, the research activities are carried out to develop alternative eco-friendly processes based on the application of enzymes as affordable catalysers for leather finishing in comparison with the conventional methods in terms of quality of the finished product, efficiency, economic and environmental sustainability.

References

- [1] Sathish et al., Journal of Cleaner Production, 2016, 112: 49–58
- [2] Dixit et al., Journal of Cleaner Production, 2015, 87(C): 39–49.
- [3] Szpyrkowicz et al., Chemical Engineering Science, 2001, 56(4): 1579–86.