**Supplementary Materials**

# Modulation Of The Catalytic Properties Of Lipase B From *Candida Antarctica* By Immobilization On Tailor-Made Magnetic Iron Oxide Nanoparticles: The Key Role Of Nanocarrier Surface Engineering.

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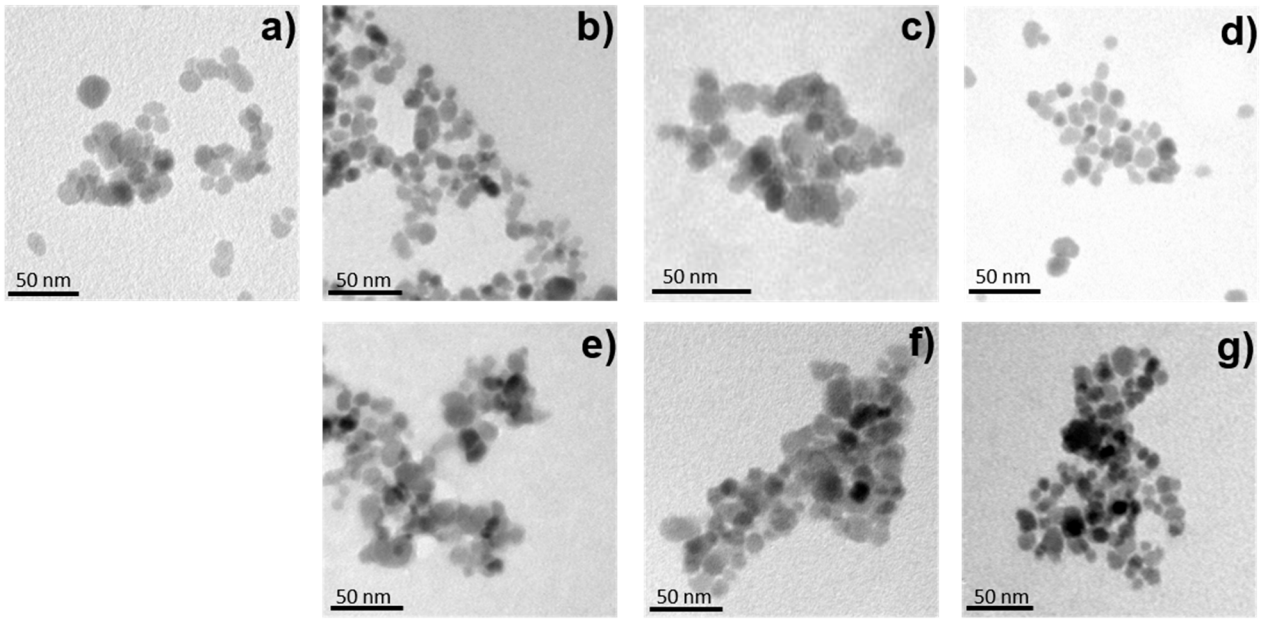


**Figure S1**: TEM micrographs of a) pristine nanoparticles, b) CA-coated NPs. c) SA-coated NPs. d) OA-coated NPs. e) $CALB_{EDA}$@CA-NPs. f) $CALB_{EDA}$@SA-NPs. g) $CALB_{EDA}$@OA-NPs.

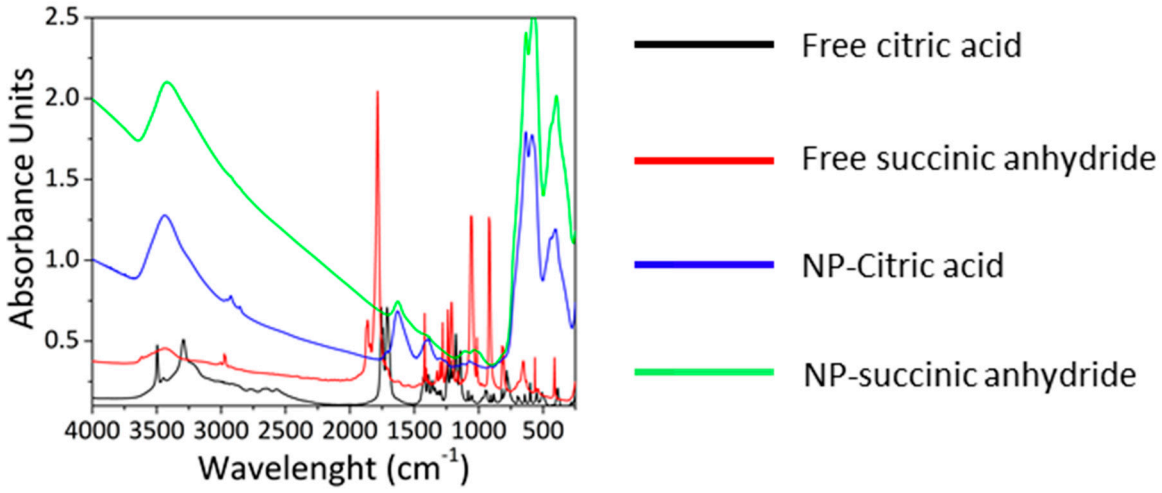


**Figure S2:** FTIR spectra of citric acid and succinic anhydride-coated NP compared to free citric acid and succinic anhydride molecules.

FTIR spectra of hydrophilic coated-NPs compared with the respective free molecules (citric acid and succinic anhydride) are reported in Figure S2. The peaks at around 1800-1700 $cm^{-1}$ in the free molecules, corresponding to asymmetric and symmetric COO- stretching, have been shifted to the right when conjugated to the NPs. The intensity of the peaks between 1500-750 $cm^{-1}$ was attenuated in the case of coated NPs due to the high amount of iron oxide nanoparticles respect to the mass of coating in the sample.

**Table S1.** Recyclability assessment of enzyme nanoderivatives.[a]

| | **$CALB_{EDA}$@CA-NPs** | | **$CALB_{EDA}$@SA-NPs** | | **$CALB_{EDA}$@OA-NPs** | |
|---|---|---|---|---|---|---|
| **Cycle** | **Specific Activity ($IU/mg_{lip}$)[b]** | ***E*** | **Specific Activity ($IU/mg_{lip}$)[b]** | ***E*** | **Specific Activity ($IU/mg_{lip}$)[b]** | ***E*** |
| 1 | 32 | 27 | 34.6 | 28 | 46.6 | 9 |
| 2 | 30 | 26.5 | 32.4 | 27.5 | 40 | 9 |
| 3 | 29.5 | 26.7 | 31 | 26.5 | 37 | 8 |

[a] Hydrolysis of 2 mM methyl DL-mandelate (R,S-**1**) in MeCN-10 mM phosphate buffer, pH 7 (5:95) at 45°C.

[b] The specific activity is expressed as IU/mg of lipase immobilized on each support. IU = μmol of substrate hydrolyzed x minute x amount of lipase.