

## Supplementary information:

### Self-assembled lipase nanosphere templated one-pot biogenic synthesis of silica hollow spheres in Ionic Liquid [Bmim][PF<sub>6</sub>]

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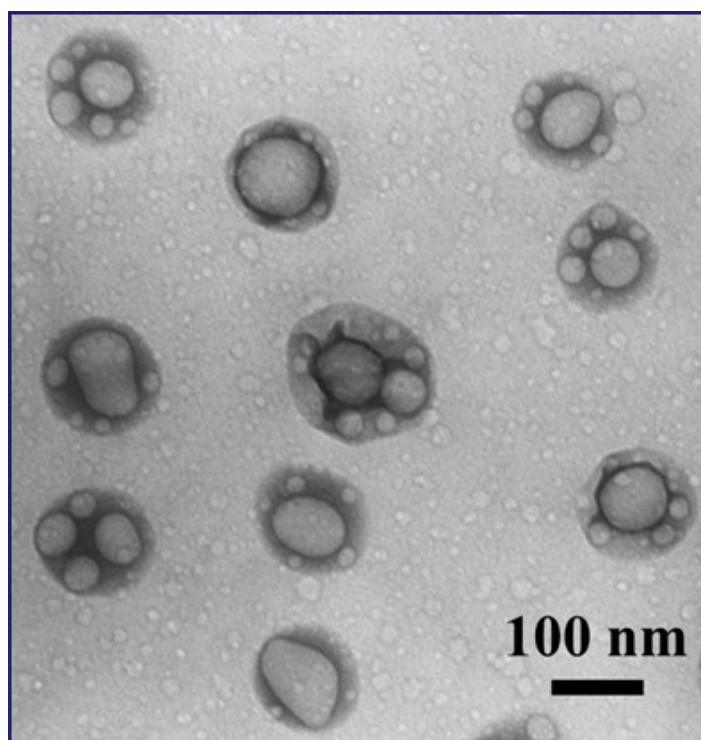
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**Table S1**

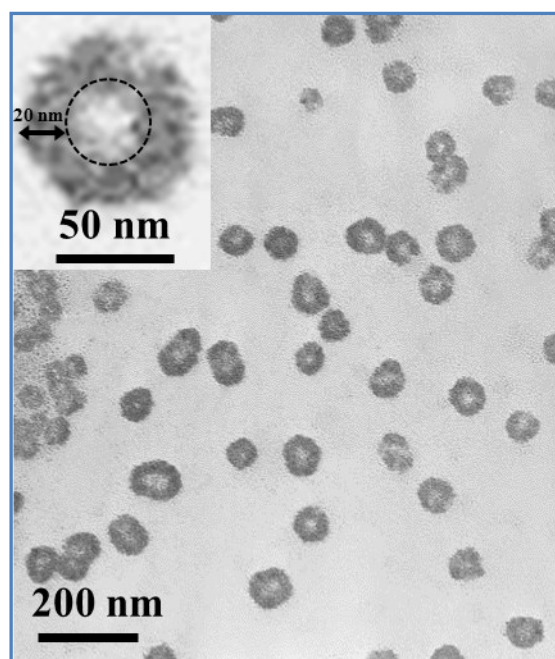
<b>Enzymes</b>	<b>% Conversion in 2 hours</b>	<b>Relative activity</b>
Lipase in de-ionized water	<b>65</b>	<b>79</b>
Lipase in Butanol	<b>69</b>	<b>84</b>
Lipase in [Bmim][BF <sub>4</sub> ]	<b>25</b>	<b>30</b>
Lipase capsules in [Bmim][PF <sub>6</sub> ],	<b>48</b>	<b>58</b>
Solid silica nano spheres with immobilized Lipase in [Bmim][BF <sub>4</sub> ]	<b>37</b>	<b>45</b>
Hollow silica nanocapsules with immobilized lipase in [Bmim][PF <sub>6</sub> ]	<b>82</b>	<b>100</b>

**Table S2**

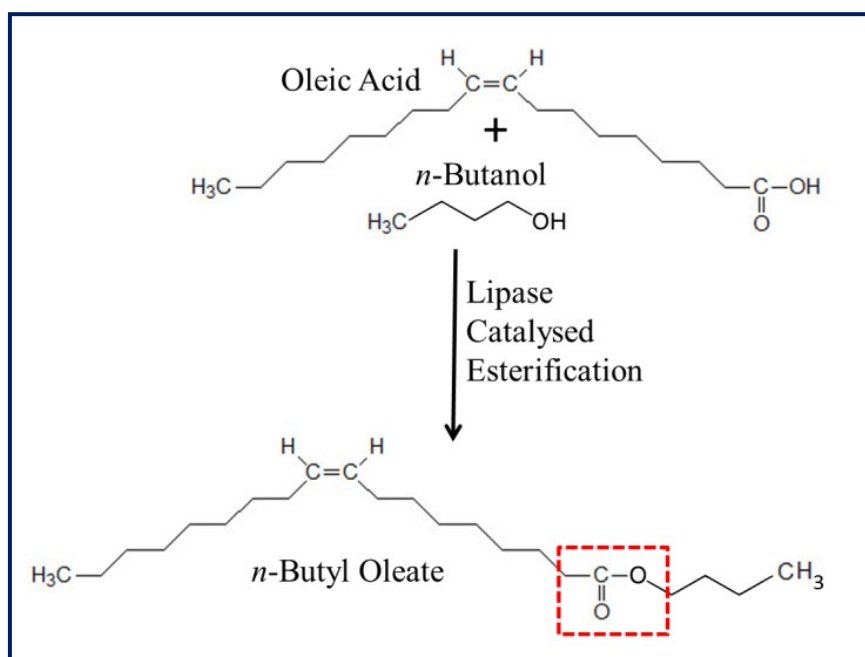
<b>Time (min)</b>	<b>Conversion (%)</b>	<b>Relative Conversion (%)</b>
<b>15</b>	<b>.8</b>	<b>1</b>
<b>30</b>	<b>4</b>	<b>5</b>
<b>45</b>	<b>20</b>	<b>25</b>
<b>60</b>	<b>43</b>	<b>52</b>
<b>75</b>	<b>67</b>	<b>82</b>
<b>90</b>	<b>76</b>	<b>93</b>
<b>105</b>	<b>80</b>	<b>98</b>
<b>120</b>	<b>82</b>	<b>100</b>



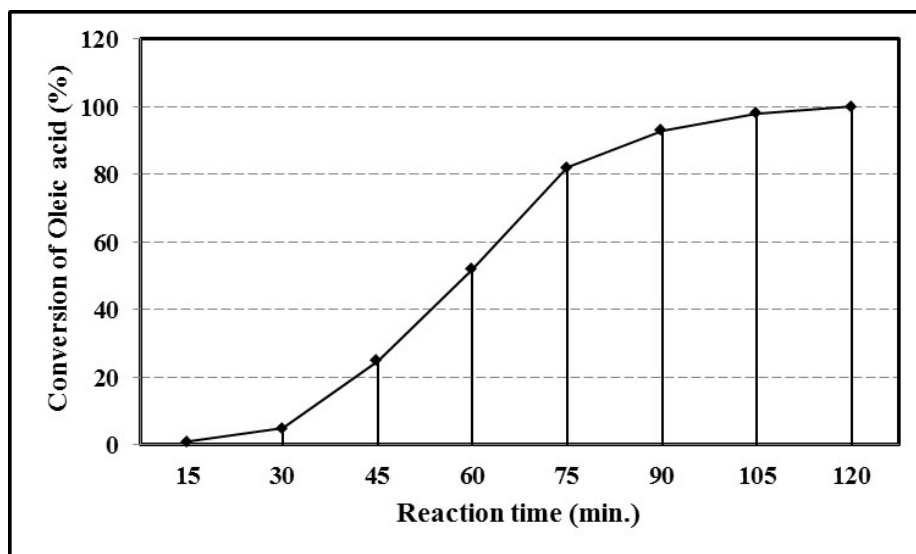
**Fig. S1** TEM images of self-assembled lipase ( $10\ \mu\text{g mL}^{-1}$ ) capsules synthesized in ionic liquid [Bmim][PF<sub>6</sub>]



**Fig. S2** Silica hollow spheres synthesized by  $20 \mu\text{g mL}^{-1}$  Papain (Protease) Enzyme (21 KDa) in hydrophilic ionic liquid [Bmim][BF<sub>4</sub>]



**Fig. S3** Lipase catalysed esterification of oleic acid and n-butanol to n-butyl oleate



**Fig. S4** Time dependent kinetics of esterification by lipase immobilized hollow silica nanocapsules in [Bmim][PF<sub>6</sub>]