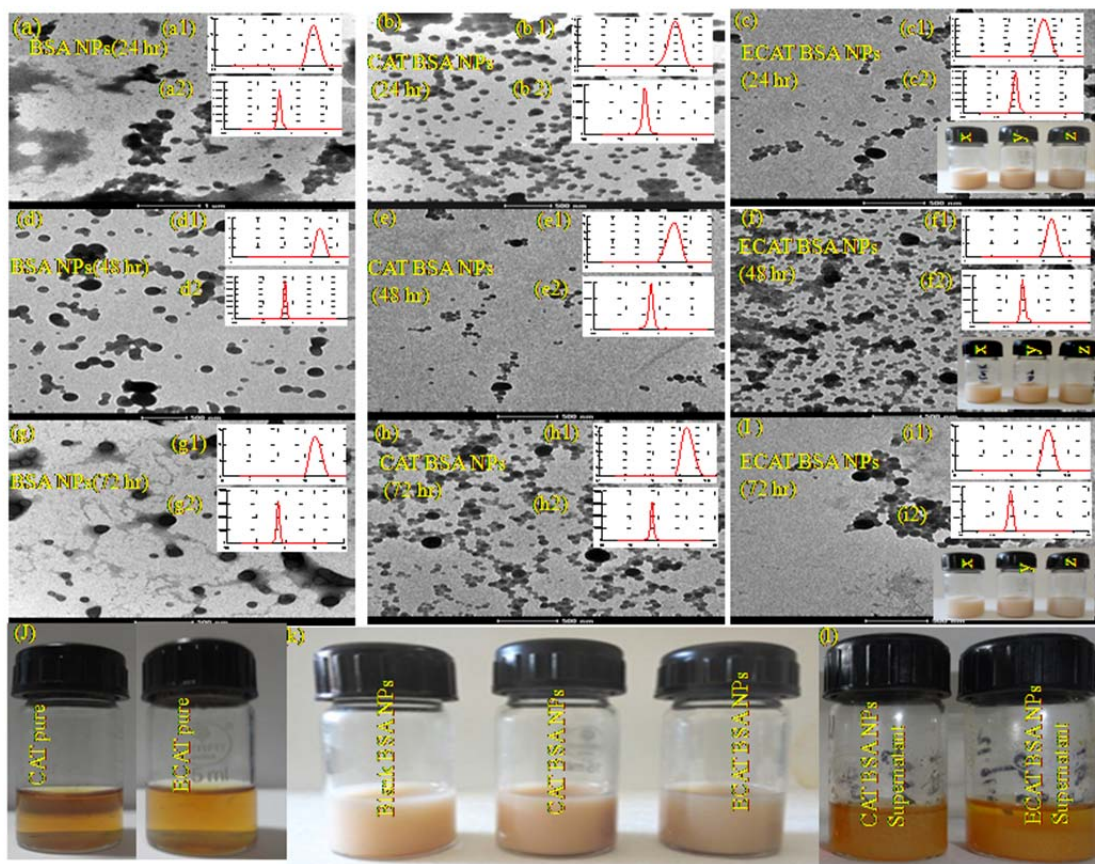


## Supplementary material to:

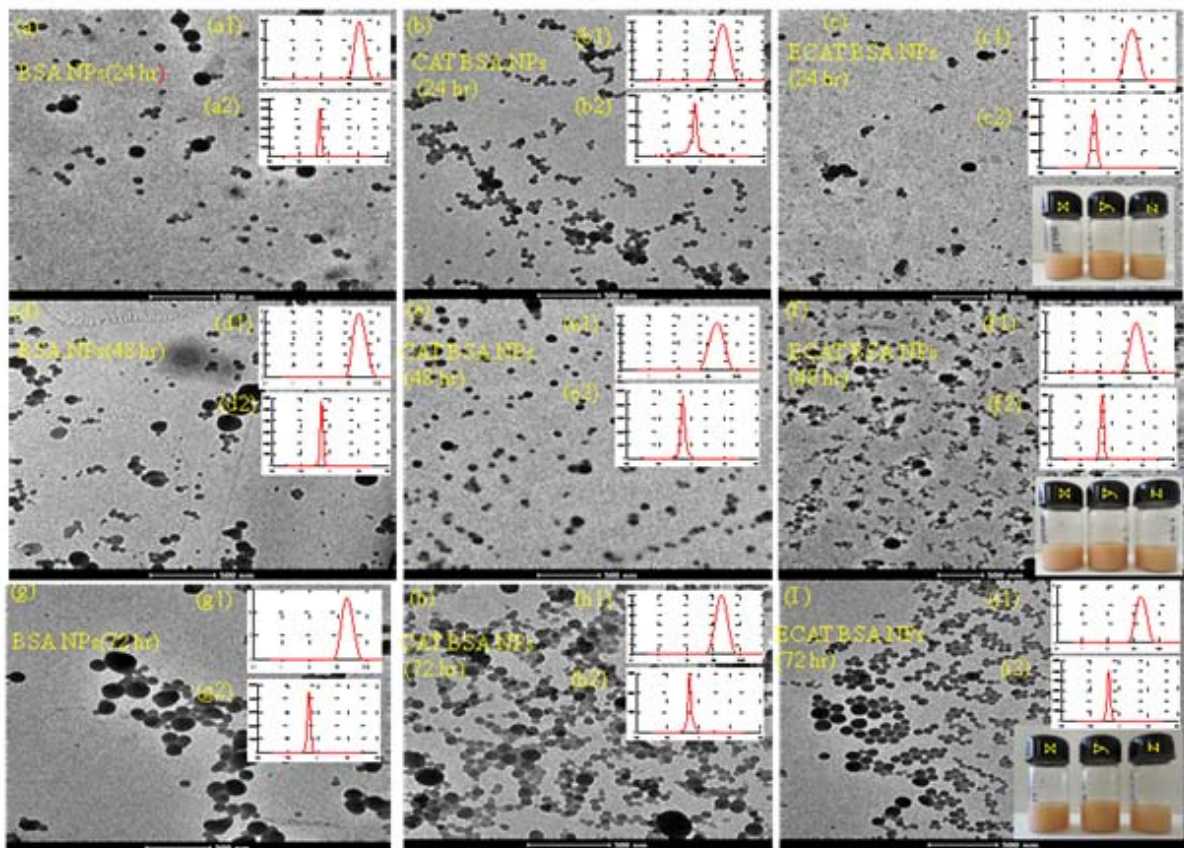
## ENCAPSULATION OF CATECHIN AND EPICATECHIN ON BSA NPS IMPROVED THEIR STABILITY AND ANTIOXIDANT POTENTIAL

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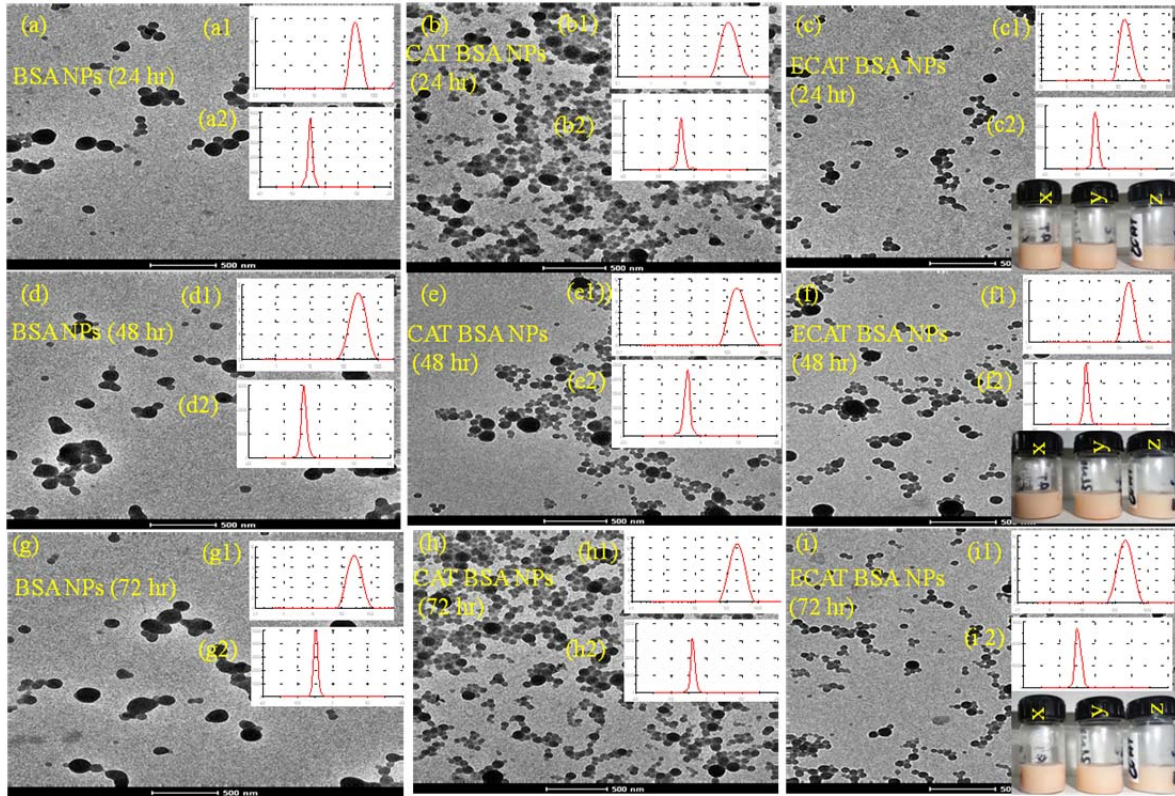


**Figure S1:** Physical stability of CAT-BSA, ECAT-BSA and BSA NPs was monitored by TEM and DLS. **(a)** TEM image of BSA NPs; Inset shows size **(a1)** and zeta potential **(a2)** of BSA NPs at 37 °C after 24 h. **(b)** TEM image of CAT-BSA NPs; Inset shows DLS size **(b1)** and zeta potential **(b2)** of CAT-BSA NPs at 37 °C after 24 h. **(c)** ECAT- BSA NPs at 37 °C after 24 hours; Inset shows DLS size **(c1)** and zeta potential **(c2)** of BSA NPs at 37 °C after 24 h. **(d)** TEM image of BSA NPs; Inset shows size **(d1)** and zeta potential **(d2)** of BSA NPs at 37 °C after 48 h. **(e)** TEM image of CAT-BSA NPs; Inset shows DLS size **(e1)** and zeta potential **(e2)** of CAT- BSA NPs at 47 °C after 48 h. **(f)** ECAT- BSA NPs at 47 °C after 48 h; Inset shows DLS size **(f1)** and zeta potential **(f2)** of BSA NPs at 37 °C after 24 h. **(g)** TEM image of BSA NPs; Inset shows size **(g1)** and zeta potential **(g2)** of BSA NPs at 37 °C after 72 h. **(h)** TEM image of CAT-BSA NPs; Inset shows DLS size **(h1)** and zeta potential **(h2)** of CAT-BSA NPs at 5 °C after 72 h. **(i)** ECAT- BSA NPs at 37 °C after 72 h; Inset shows DLS size **(i1)** and zeta potential **(i2)** of BSA NPs at 37 °C after 72 h. **(j)** Photographs of pure CAT and pure ECAT. Pure catechin got oxidised after 72 h. **(k)** Photographs of blank-BSA NPs, CAT-BSA NPs and ECAT-BSA NPs. BSA NPs protect the oxidation of CAT and ECAT. **(l)** Photograph of supernatant obtained after separation of CAT-BSA NPs and ECAT-BSA NPs.

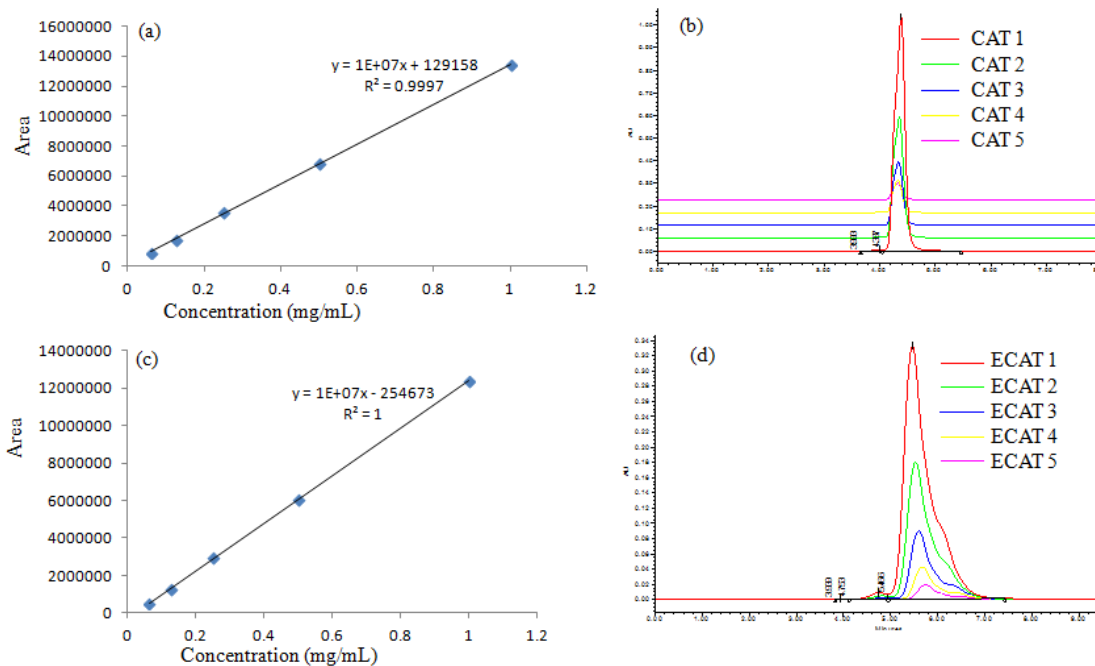


**Figure S2:** The stability study of blank-BSA NPs, CAT-BSA NPs and ECAT-BSA NPs were observed using the TEM and Zeta sizer at 47 °C. The DLS size (a1, b1, c1, d1, e1, f1, g1, h1 and i1), Zeta potential (a2, b2, c2, d2, e2, f2, g2, h2 and i2) scan was captured at preselected time (24, 48 and 72 h). NPs were analysed visually for their colour change (loaded and blank) and size (TEM picture) and recorded results were shown no degradation of NPs.

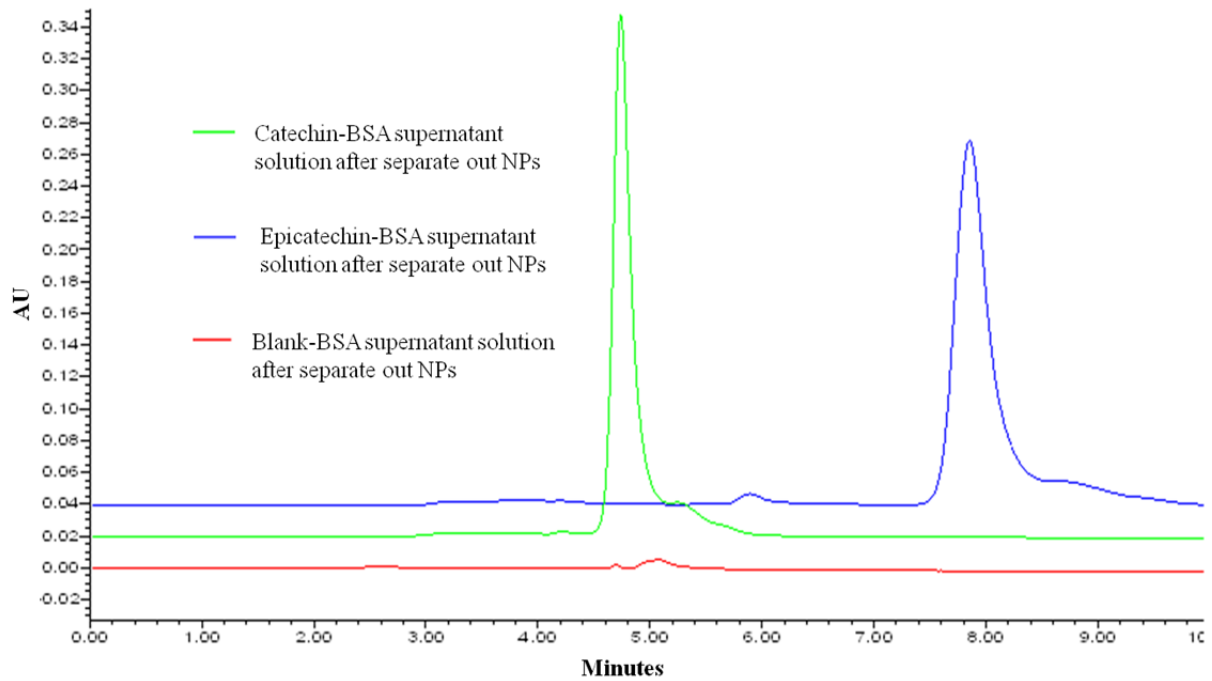




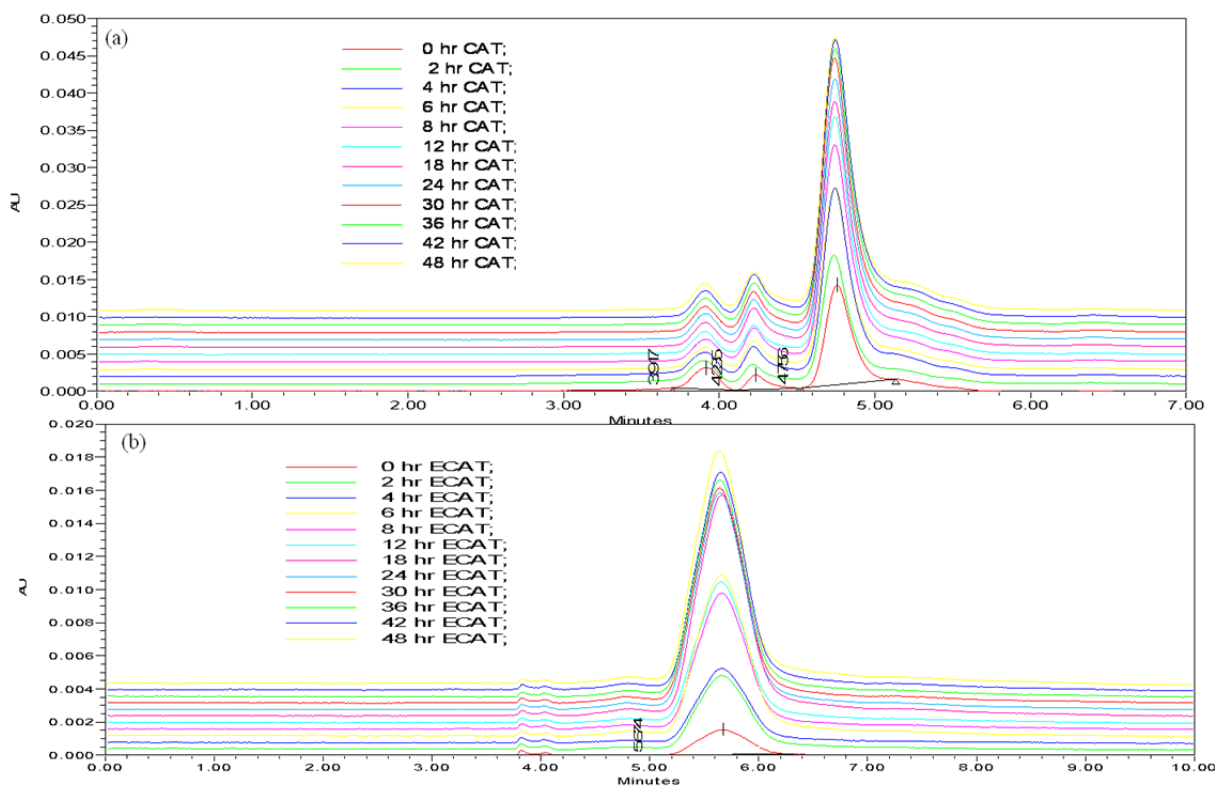
**Figure S3:** The stability study of blank-BSA NPs, CAT-BSA NPs and ECAT-BSA NPs were observed using the TEM and DLS at 57 °C. The zeta size (a1, b1, c1, d1, e1, f1, g1, h1 and i1) and zeta potential (a2, b2, c2, d2, e2, f2, g2, h2 and i2) scan were analysed. Data generated from TEM and Zeta sizer give the conformation about the stability of blank as well as loaded NPs.



**Figure S4:** Catechin (CAT) calibration curve and their HPLC chromatogram (a and b): CAT 1 (1 mg/ml); CAT 2 (0.5 mg/ml); CAT 3 (0.25 mg/ml); CAT 4 (0.125 mg/ml); CAT 5 (0.0625 mg/ml). Epicatechin (ECAT) calibration curve and their HPLC chromatogram (c and d): ECAT 1(1 mg/ml); ECAT 2 (0.5 mg/ml); ECAT 3 (0.25 mg/ml); ECAT 4 (0.125 mg/ml); ECAT 5 (0.0625 mg/ml)



**Figure S5:** HPLC chromatograms of catechin-BSA supernatant after NPs separation (green middle scan); epicatechin-BSA supernatant solution (upper blue scan); blank-BSA supernatant solution (red lower scan)



**Figure S6:** The relaxing HPLC chromatogram of CAT (a) and ECAT (b). Both the chromatogram give clear peak of CAT and ECAT.