Disorder and quantum size effects on Kondo interactions and magnetic correlation in CePt$_2$ Y.Y. CHEN, T.K. LEE, Institute of Physics, Academia Sinica, Taipei, Taiwan, J.M. LAWRENCE, Department of Physics and Astronomy, University of California, Irvine, California, C.H. BOOTH, Chemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, California — Measurements of specific heat $C(T)$ and magnetic susceptibility $\chi(T)$ on a series of CePt$_2$ nanoparticles with size $d= 3.1$, 22 and 26 nm are compared to those of bulk CePt$_2$ to determine the size effects on Kondo interactions and magnetic correlation therein. Kondo interactions ($T_K=5.6$ K) and an antiferromagnetic correlation ($T_N=1.6$ K) coexist in CePt$_2$ with $\sim60\%$ and $\sim40\%$ of Ce magnetic ions involved in respectively. While the antiferromagnetism is diminished by size reduction, Kondo behaviour predominates, with a Sommerfeld constant $\gamma$ increasing from 460 mJ/f.u. K$^2$ for the bulk to 3000 mJ/f.u. K$^2$ for 3.1 nm. Meanwhile, a decrease of Kondo temperature $T_K$ from 5.6 to 0.42 K is observed with the size reduction. The consequences were explained by structural disorders, however for $d < 10$ nm electronic quantum size effect play a more significant role.