



**Figure 1.** Distribution and metabolism of cytosine modifications within genes in ES cells and neurons. (A) TET-mediated oxidation of 5mC followed by base excision repair (BER)-mediated removal of 5caC keeps promoters and enhancers free of methylation in ES cells. It is also possible that oxidation of 5mC blocks maintenance methylation at these regions. MeCP2 binds both 5mC (B) and 5hmC (C) in neuronal gene bodies, where the cytosine modification state correlates with the level of expression.