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Upregulation of HDAC2 in Laser Capture Nigral Microglia in Parkinson's Disease.

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## 20 **Abstract**

21 Histone deacetylase (HDAC) inhibitors have been widely reported to have considerable  
22 therapeutic potential in a host of neurodegenerative diseases. However, HDAC inhibitor  
23 selectivity and specificity in specific cell classes has been a source of much debate. In order to  
24 address the role of HDAC2 in specific cell classes, and in disease, we examined glial protein and  
25 mRNA levels in substantia nigra (SN) of Parkinson's disease (PD) and normal controls (NC) by  
26 immunohistochemistry, and laser captured microdissection followed by qRT-PCR. Differential  
27 expression analysis in immunohistochemically defined laser capture microglia revealed  
28 significant up-regulation of HDAC2 in PD SN compared to NC subjects. Complementary *in*  
29 *vivo* evidence reveals significant upregulation of HDAC2 protein levels in PD SN microglia  
30 compared to NC subjects. Correspondingly, human telencephalic/mesencephalic immortalized  
31 microglial cells reveal significant up-regulation of HDAC2 in the presence of the potent  
32 microglial activator lipopolysaccharide (LPS). These data provide evidence that selective

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