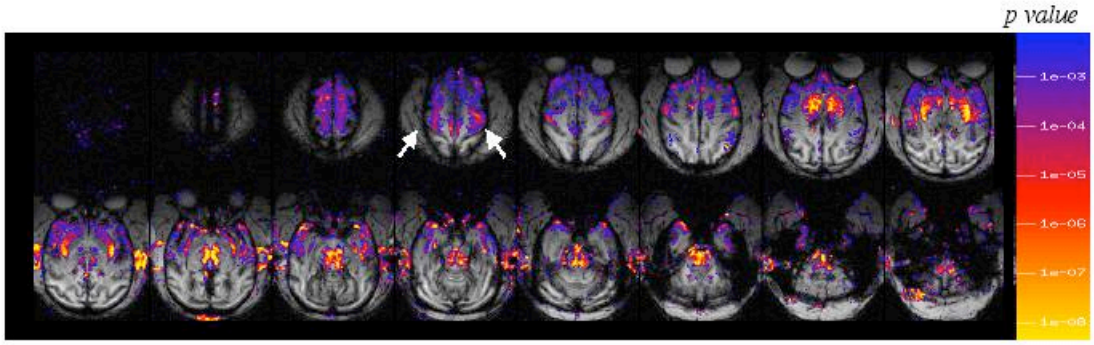
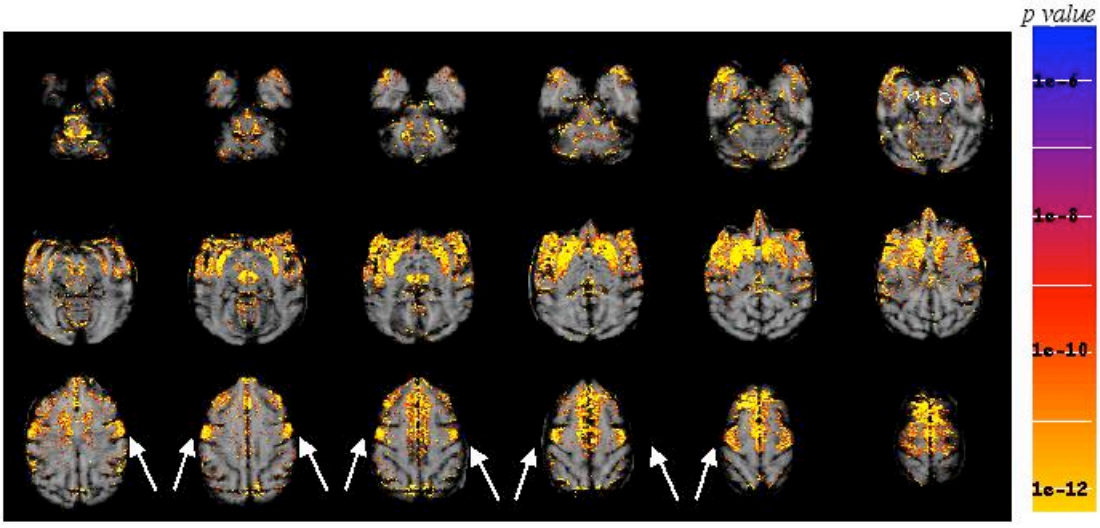
Supplementary Material

Out of the ten monkeys that were treated with MPTP, two displayed anomalous maps after amphetamine administration. The first animal did not develop overt Parkinsonian symptoms and showed a decrease in ^{11}C-CFT binding potential of only 27%. This animal maintained a robust rCBV response to amphetamine in all brain regions, but also showed increased activation in primary motor and pre-motor areas as shown in Figure S1. A second animal in spite of being Parkinsonian and having a ^{11}C-CFT binding potential decreased by 63% still showed a robust response to amphetamine as shown in Figure S2. This animal also showed a very robust behavioral response to L-DOPA. Unlike the partially lesioned animal showed in Fig. S1, this animal showed no rCBV response in the substantia nigra. These data point out the possibility that the amphetamine challenge may prove predictive of response to L-DOPA.



Supplementary Figure 1 - A statistical parametric map (t-test; top) of significant rCBV increases in a partially lesioned macaque at 2.5 mg/kg amphetamine. This animal showed only small behavioral effects and had a 27% decrease in ^{11}C-CFT binding potential. The phMRI images show increased recruitment of motor cortex (white arrows) not seen in either the control or fully-lesioned animals.



Supplementary Figure 2- A statistical parametric map (t-test; top) of significant rCBV increases in an MPTP-treated macaque at 2.5 mg/kg of amphetamine. This animal was parkinsonian (UPDRS score = 16) and had a decrease in ^{11}C-CFT binding potential of 63%. A repeat phMRI study showed a similar pattern. This animal had a large increase of CBV in the pre-motor cortex (white arrows). There was, however, a marked loss of rCBV changes in SN (white circles). Interestingly, this animal showed complete reversal of parkinsonian signs with low doses of L-DOPA suggesting that preservation of striatal rCBV changes in response to amphetamine might indicate compensatory adaptive mechanisms in the circuitry.