

Supporting Information

Imaging Nicotine in Rat Brain Tissue Using Nanospray Desorption Electrospray Ionization Mass Spectrometry

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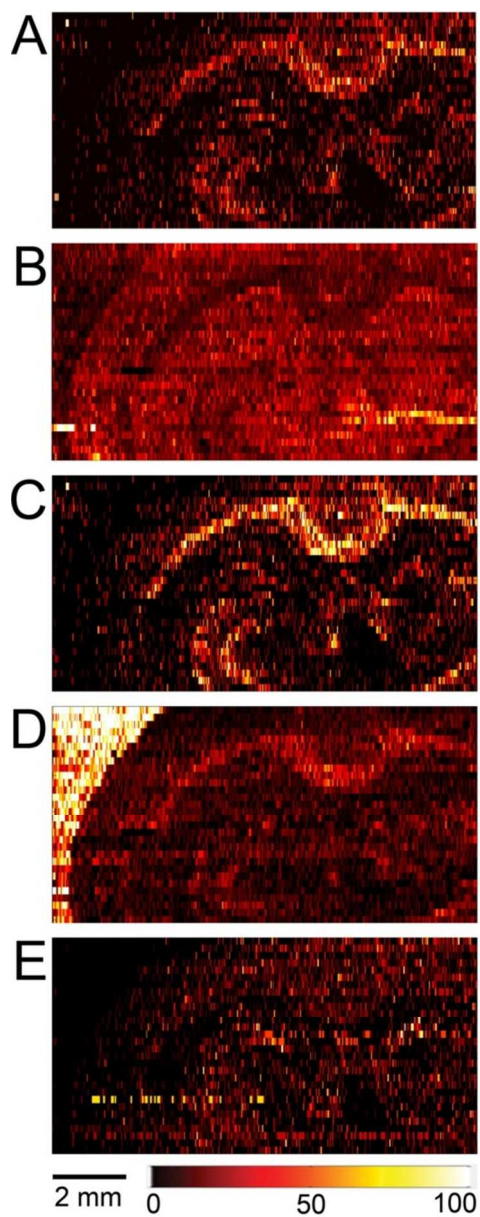


Figure S1. Ion images obtained from one coronal section of brain tissue from rat number 1 following *in vivo* administration of nicotine. A) $[M+H]^+$ ion of nicotine (m/z 163.1235); B) Total ion current (TIC) (m/z 120–2000); C) $[M+H]^+$ ion of nicotine (m/z 163.1235) normalized to TIC; D) Deuterated $[M+H]^+$ ion of nicotine (m/z 166.1420); E) $[M+H]^+$ ion of nicotine (m/z 163.1235) normalized to deuterated $[M+H]^+$ ion of nicotine (m/z 166.1420). Color bar shows signal from low (left) to high (right). Note how normalization to the TIC image increases the matrix effects

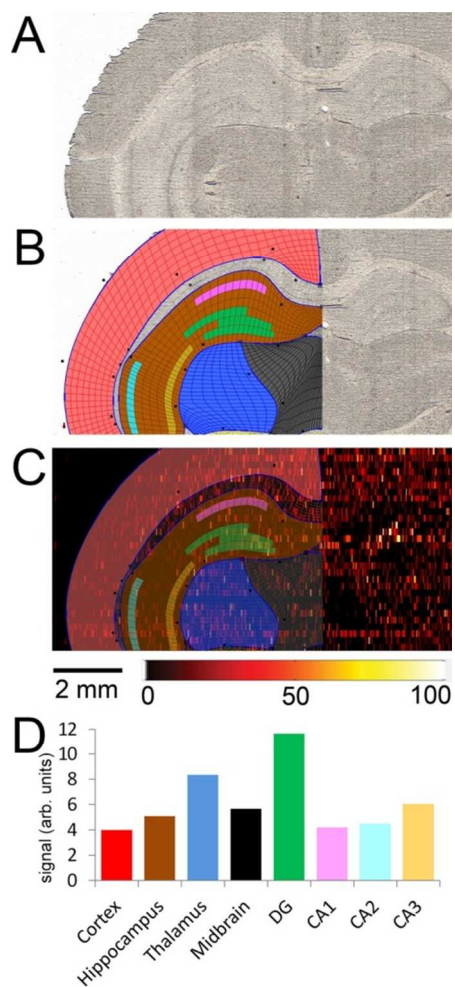


Figure S2. Atlas-based analysis of regional levels of nicotine using results from brain tissue from rat number 1. A) Optical image of the nicotine *in vivo* dosed brain tissue section before nano-DESI analysis. B) Atlas mesh deformed to match external and internal region boundaries of the optical image. Major regions explicitly defined are cortex (red), hippocampus (brown), thalamus (blue), and midbrain (black). Hippocampus subregions associated with mesh are DG (green), CA1 (pink), CA2 (light blue), and CA3 (yellow). (C) The atlas mesh displayed in relation to the ion image of nicotine normalized to deuterated nicotine showing the localization to the regions and subregions. The color bar below indicates signal from low to high. (D) Plot of mean nicotine signal by region and subregion.

Table S1. Obtained data from sections of nicotine dosed rat brain # 2

Sample #	1	2	3	4	5	Average
Weight (mg)	2.58	2.28	2.39	2.3	2.32	2.4 ± 1.2
μM in sample	0.31	0.28	0.33	0.33	0.30	
# spectra used for error bars	274	246	211	309	304	
pmole / section	61.6	56.0	66.6	66.0	59.6	62 ± 4.4
μg nicotine/g brain tissue	3.9	4.0	4.5	4.7	4.2	4.2 ± 0.3

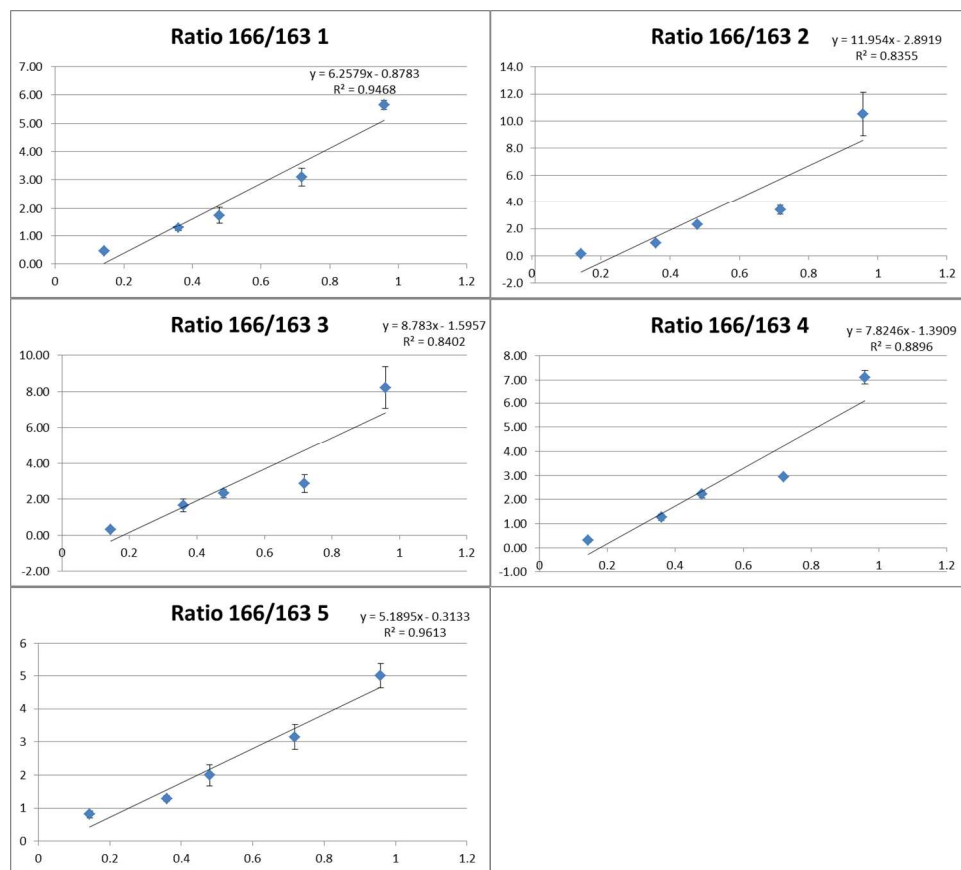


Figure S3 – Linear regression plots for 5 brain tissue sections from rat #2. Intensity ratio of the $[M+H]^+$ ion of d-nicotine over the $[M+H]^+$ ion of nicotine plotted against the concentration of d-nicotine. Error bars represent standard deviation, n=3.