

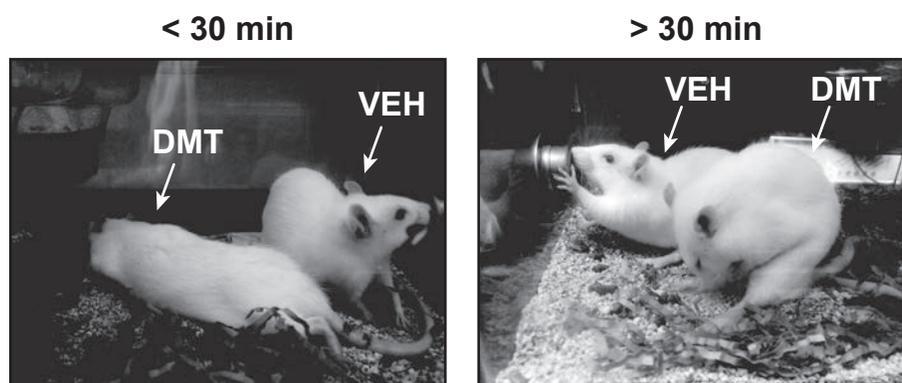
# **Effects of *N,N*-dimethyltryptamine (DMT) on rat behaviors relevant to anxiety and depression**

**Supplementary Material**  
(8 pages)

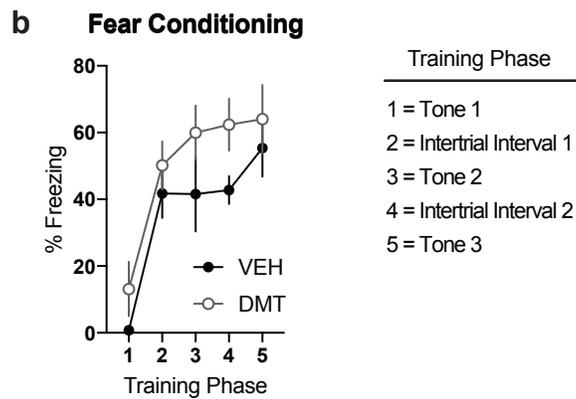
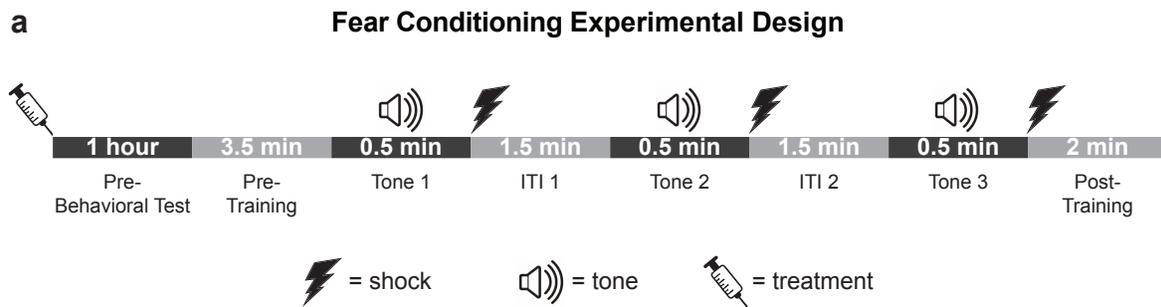
Lindsay P. Cameron, Charlie J. Benson, Lee E. Dunlap, and David E. Olson\*

*Department of Chemistry*  
*Department of Biochemistry & Molecular Medicine*  
*Center for Neuroscience*

*University of California, Davis*  
*Davis, CA 95616*



**Figure S1.** Administration of DMT (10 mg/kg) results in a rapid change in posture characterized by prostration and extension of the hind limbs (i.e., flat body posture and hind limb abduction). This phenotype is no longer apparent 1 h following drug administration, with animals resuming normal home cage behavior.



**Figure S2.** Additional information regarding the fear conditioning experiment. (a) Fear conditioning experimental design. (b) Percent freezing measured during the tone-shock pairings and intertrial intervals during fear conditioning. There were no statistical differences between the treatment groups at the indicated phases as measured by a two-way ANOVA (Sidak post-hoc test).

Reference	Ayahuasca Dose	Equivalent DMT Dose	Animal Species	Behavioral Test	Finding
<b>Pic-Taylor et al., 2015</b>	Ayahuasca	9 mg/kg	Wistar Rats (female)	Elevated Plus Maze	More time spent in closed-arms
<b>Pic-Taylor et al., 2015</b>	Ayahuasca	9 mg/kg	Wistar Rats (female)	Forced Swim Test	Reduced immobility
<b>Pic-Taylor et al., 2015</b>	Ayahuasca	9 mg/kg	Wistar Rats (female)	Open Field	Reduced locomotor activity, less time spent rearing and grooming
<b>Lima et al., 2007</b>	Ayahuasca 10 mg/kg	DMT levels unknown	Wistar Rats (male)	Forced Swim Test	Reduced immobility
<b>Lima et al., 2007</b>	Ayahuasca 10 mg/kg	DMT levels unknown	Wistar Rats (male)	Open Field	No effect on locomotor activity
<b>Lima et al., 2007</b>	Ayahuasca 10 mg/kg	DMT levels unknown	Wistar Rats (male)	Rotarod	No change in motor coordination
<b>Farzin and Mansouri 2006</b>	Harmane 10 mg/kg	N/A	Swiss-Webster Mice (male)	Forced Swim Test	Reduced immobility
<b>Farzin and Mansouri 2006</b>	Norharmane 10 mg/kg	N/A	Swiss-Webster Mice (male)	Forced Swim Test	Reduced immobility
<b>Farzin and Mansouri 2006</b>	Harmine 10 mg/kg	N/A	Swiss-Webster Mice (male)	Forced Swim Test	Reduced immobility
<b>Fortunato et al., 2009</b>	Harmine 10 mg/kg	N/A	Wistar Rats (male)	Forced Swim Test	Reduced immobility
<b>Ahlem et al., 2015</b>	Harmine 15 mg/kg	N/A	Wistar Rats (male)	Elevated Plus Maze	Larger number of open-arm entries
<b>Hilber and Chapillon, 2005</b>	Harmaline 20 mg/kg	N/A	SWISS Albino Mice (male)	Elevated Plus Maze	Larger number of open-arm entries
<b>Fortunato et al., 2010a</b>	Harmine 15 mg/kg	N/A	Wistar Rats (male)	Open Field	No affect on locomotor behavior
<b>Fortunato et al., 2010b</b>	Harmine 10 mg/kg	N/A	Wistar Rats (male)	Forced Swim Test	Reduced immonbility
<b>Fortunato et al., 2010b</b>	Harmine 15 mg/kg	N/A	Wistar Rats (male)	Open Field	No affect on locomotor behavior

**Table S1. Prior studies investigating the behavioral effects of ayahuasca or its chemical constituents.**

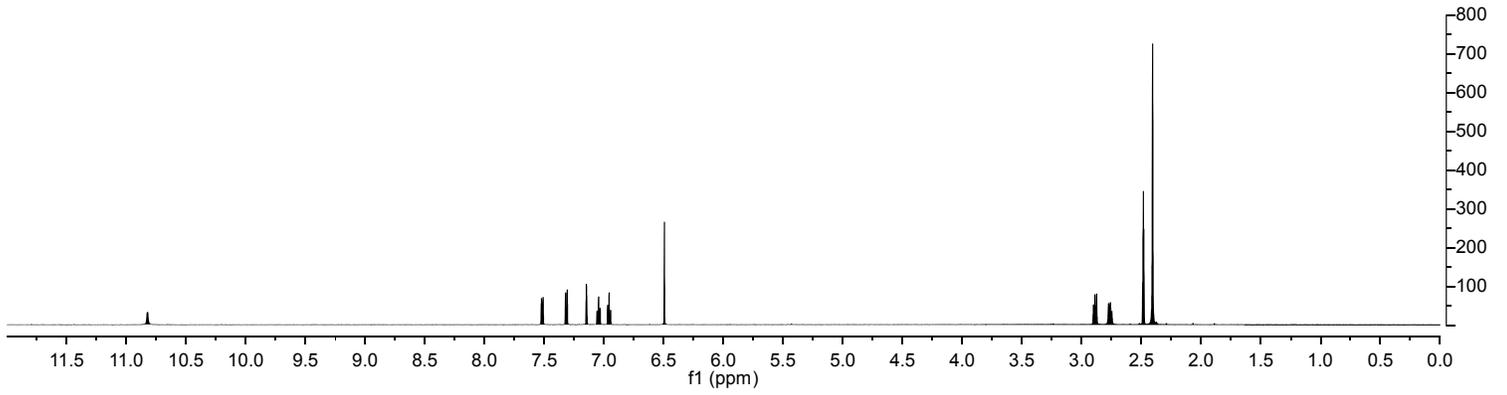
Figure	Statistical Test	Comparison	P value	F	t	df
<b>2b</b>	Two-way repeated measures ANOVA	VEH to DMT	0.0094	8.865	-	DFn = 1 DFd = 15
<b>2b</b>	Two-way repeated measures ANOVA	Time	< 0.001	10.4	-	DFn = 44 DFd = 660
<b>2c</b>	Unpaired two-tailed t test	VEH to DMT	0.0094	4.467	2.977	15
<b>2d</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (margin)	0.8465	8.229 x 10 <sup>-13</sup>	0.518	30
<b>2d</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (center)	0.8465	8.229 x 10 <sup>-13</sup>	0.518	30
<b>2e</b>	Unpaired two-tailed t test	VEH to DMT	0.0163	3.341	2.705	15
<b>2f</b>	Unpaired two-tailed t test	VEH to DMT	0.0264	5.522	2.463	15
<b>2g</b>	Unpaired two-tailed t test	VEH to DMT	0.0964	1.269	1.774	15
<b>2h</b>	Unpaired two-tailed t test	VEH to DMT	0.0240	1.001	2.511	15
<b>2i</b>	Unpaired two-tailed t test	VEH to DMT	0.0022	1.286	3.691	15
<b>2j</b>	Unpaired two-tailed t test	VEH to DMT	0.0229	1.05	2.533	15
<b>2k</b>	Unpaired two-tailed t test	VEH to DMT	0.1051	2.353	1.725	15
<b>2l</b>	Unpaired two-tailed t test	VEH to DMT	0.0833	2.754	1.855	15
<b>3b (Training)</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Pre-Training)	0.9873	3.203	0.1431	28
<b>3b (Training)</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Post-Training)	0.0473	3.203	2.388	28
<b>3b (Context)</b>	Unpaired two-tailed t test	VEH to DMT	0.2623	1.327	1.168	14
<b>3b (Cue)</b>	Unpaired two-tailed t test	VEH to DMT	0.6180	2.516	0.51	14
<b>4b</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Pre-Training)	> 0.9999	0.6571	0.007367	60
<b>4b</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Post-Training)	0.4422	0.6571	1.154	60
<b>4c</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Tone 1)	0.2477	27.11	2.121	240
<b>4c</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Tone 2)	0.9881	27.11	0.799	240
<b>4c</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Tone 3)	0.8200	27.11	1.306	240
<b>4c</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Tone 4)	0.2968	27.11	2.034	240
<b>4c</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Tone 5)	0.8880	27.11	1.179	240
<b>4c</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Tone 6)	0.2377	27.11	2.14	240

<b>4c</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Tone 7)	0.0269	27.11	2.959	240
<b>4c</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Tone 8)	0.2135	27.11	2.189	240
<b>4d</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Tone 1)	0.0898	26.93	2.541	240
<b>4d</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Tone 2)	0.1738	26.93	2.278	240
<b>4d</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Tone 3)	0.0425	26.93	2.807	240
<b>4d</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Tone 4)	0.7217	26.93	1.452	240
<b>4d</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Tone 5)	0.4848	26.93	1.761	240
<b>4d</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Tone 6)	0.6927	26.93	1.492	240
<b>4d</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Tone 7)	0.9166	26.93	1.113	240
<b>4d</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Tone 8)	0.8611	26.93	1.233	240
<b>4e</b>	Unpaired two-tailed t test	VEH to DMT	0.0288	1.238	2.296	30
<b>4g</b>	Two-way repeated measures ANOVA	Extinction Day	0.0073	4.583	-	DFn = 3 DFd = 42
<b>4h</b>	Mann-Whitney Two-Tailed Test	VEH to DMT	0.6454	-	-	-
<b>5b</b>	One-way ANOVA (Tukey Post-Hoc)	VEH to DMT (Immobility)	0.0311	6.097	-	15
<b>5b</b>	One-way ANOVA (Tukey Post-Hoc)	VEH to KET (Immobility)	0.0162	6.097	-	15
<b>5b</b>	One-way ANOVA (Tukey Post-Hoc)	DMT to KET (Immobility)	0.9413	6.097	-	15
<b>5b</b>	One-way ANOVA (Tukey Post-Hoc)	VEH to DMT (Swimming)	0.0024	9.182	-	15
<b>5b</b>	One-way ANOVA (Tukey Post-Hoc)	VEH to KET (Swimming)	0.0220	9.182	-	15
<b>5b</b>	One-way ANOVA (Tukey Post-Hoc)	DMT to KET (Swimming)	0.5178	9.182	-	15
<b>5b</b>	One-way ANOVA (Tukey Post-Hoc)	VEH to DMT (Climbing)	0.7562	2.412	-	15
<b>5b</b>	One-way ANOVA (Tukey Post-Hoc)	VEH to KET (Climbing)	0.3475	2.412	-	15
<b>5b</b>	One-way ANOVA (Tukey Post-Hoc)	DMT to KET (Climbing)	0.1118	2.412	-	15
<b>S2b</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Training Phase 1)	0.7978	7.267	1.103	70
<b>S2b</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Training Phase 2)	0.9527	7.267	0.7483	70
<b>S2b</b>	Two-way ANOVA (Sidak Post-Hoc)	VEH to DMT (Training Phase 3)	0.4236	7.267	1.646	70
<b>S2b</b>	Two-way ANOVA	VEH to DMT	0.3559	7.267	1.752	70

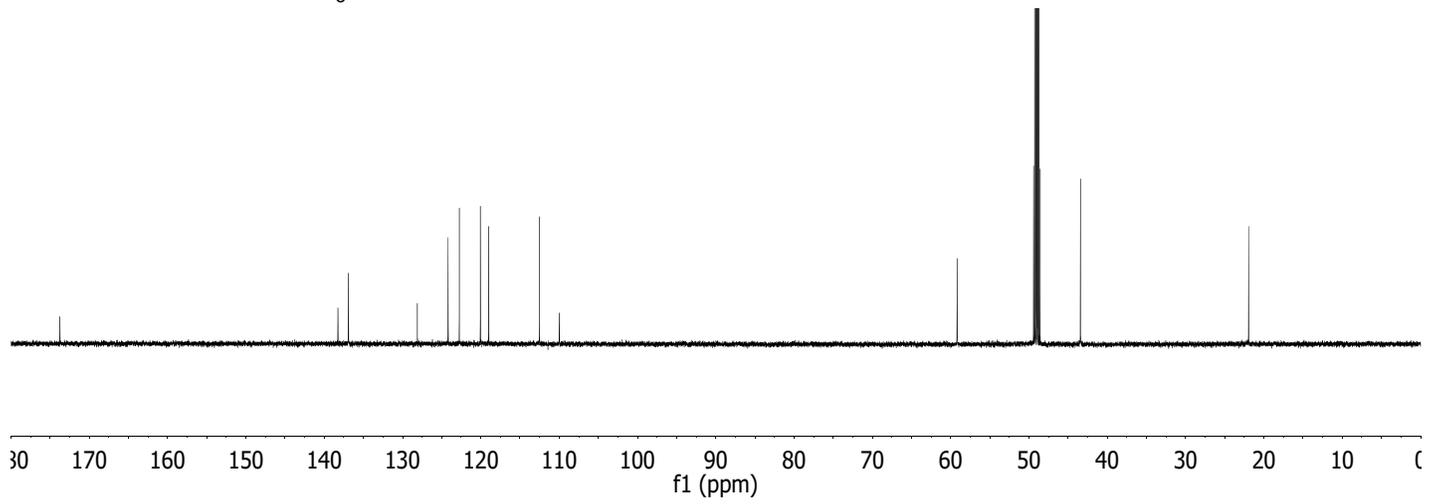
<b>S2b</b>	(Sidak Post-Hoc) Two-way ANOVA (Sidak Post-Hoc)	(Training Phase 4) VEH to DMT (Training Phase 5)	0.9443	7.267	0.7788	70
------------	-------------------------------------------------------	--------------------------------------------------------	--------	-------	--------	----

**Table S2. Parameters for all statistical tests.**

<sup>1</sup>H NMR of 2:1 DMT:fumaric acid  
600 MHz, DMSO-*d*<sub>6</sub>



<sup>13</sup>C NMR of 2:1 DMT:fumaric acid  
100 MHz, CD<sub>3</sub>OD



# LC-MS Chromatogram for DMT•fumarate (2:1)

