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Session 359 - Comparative Anatomy: Development and Evolution

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# 359.01 / D4 - A comparison of cannabinoid receptor 1-immunoreactive axon density in the amygdala among nine primate species

November 14, 2022, 1:00 PM - 5:00 PM | SDCC Halls B-H

**Presenter at Poster**
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***D. N. JONES**[1], K. N. HIRTER[1], E. L. MUNGER[1], C. C. SHERWOOD[2], W. D. HOPKINS[3], P. R. HOF[4], M. RAGHANTI[1]; [1]Dept. of Anthrop., Kent State Univ., Kent, OH; [2]Dept. of Anthrop., George Washington Univ., Washington, DC; [3]Dept. of Comparative Med. Michael E. Keeling Ctr. for Comparative Med. and Res., Univ. of Texas, Bastrop, TX; [4]Nash Family Dept. of Neurosci. and Friedman Brain Inst., Icahn Sch. of Med. at Mount Sinai, New York, NY. A comparison of cannabinoid receptor 1-immunoreactive axon density in the amygdala among nine primate species. Program No. 359.01. 2022 Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience, 2022. Online.

**Authors**
***D. N. JONES**[1], K. N. HIRTER[1], E. L. MUNGER[1], C. C. SHERWOOD[2], W. D. HOPKINS[3], P. R. HOF[4], M. RAGHANTI[1];
[1]Dept. of Anthrop., Kent State Univ., Kent, OH; [2]Dept. of Anthrop., George Washington Univ., Washington, DC; [3]Dept. of Comparative Med. Michael E. Keeling Ctr. for Comparative Med. and Res., Univ. of Texas, Bastrop, TX; [4]Nash Family Dept. of Neurosci. and Friedman Brain Inst., Icahn Sch. of Med. at Mount Sinai, New York, NY

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**Abstract**
The amygdala is a sensory integration center that plays an important role in emotional learning, behavior, and motivation. Cannabinoid signaling in the amygdala modulates aspects of anxiety, aggression, and fear in rodents via cannabinoid receptor 1, however little is known about cannabinoid signaling in the amygdala of humans and nonhuman primates. Primates are behaviorally diverse, with closely related species often displaying distinct social styles characterized by varying degrees of social tolerance and agonistic tendencies. Such behavioral differences are thought to be associated with neurochemical differences among species. Given what is known about the functional role of cannabinoid signaling in the amygdala, we tested whether relatively tolerant species, such as humans, bonobos, and marmosets, possess relatively higher cannabinoid receptor 1-immunoreactive (CB1R-ir) axon density in the basolateral amygdala. We used immunohistochemistry and stereological methods to compare CB1R-ir axon density among 47 primates representing nine species: humans (n=5), chimpanzees (n=6), bonobos (n=2), baboons (n=6), rhesus macaques (n=5), Japanese macaques (n=6), pigtail macaques (n=6), marmosets (n=5), and capuchins (n=6). The basolateral amygdala is comprised of the lateral, basal, and accessory basal nuclei. Stereological data for each nucleus was collected separately. After ruling out sex differences within each species, we used repeated measures ANOVA to evaluate species differences. The interaction ($F_{16,76}$ = 5.061, p<.001) and main effects of species ($F_{8,38}$ = 8.007, p<.001) and area ($F_{2,76}$ = 59.616, p<.001) were all significant. However, the observedspecies differences did not support our hypothesis related to social tolerance nor did the data conform to a phylogenetic pattern. Instead, we found that while some closely related species differed from each other in a nucleus-dependent manner, some distantly related species shared unexpected similarities. Our results highlight the need for additional comparative work on the cannabinoid system from a molecular and genetic perspective. We discuss the implications of our observations with special focus on primate brain evolution and its connection to primate social style.