The endogenous lipid messenger facilitates Fear memory and releases histamine from the basolateral amygdala (BLA)

Gustavo Provensi1, Elisabetta Baldi2, Corrado Bucherelli2, Patrizio Blandina1, Carla Ghelardini1, Maria Beatrice Passani1

1Dept. of Neurosciences, Psychology, Drug Research and Child Health, Pharmacology and Toxicology Session, University of Florence, Florence, Italy

2Dept. of Experimental and Clincal Medicine, Division of Physiology, University of Florence, Florence, Italy

Neuronal histamine participates to oleoylethanolamide hypophagic effects. Since histamine is involved in mnemonic processes, we investigated if brain histamine is also required for oleoylethanolamide-induced promnesic effects.

Wistar rats (280-300 g) were submitted to contextual fear conditioning, and immediately after received an oleoylethanolamide injection (10 mg/kg, ip). Memory was assessed 72 hours after injections. Oleoylethanolamide-treated animals showed a longer freezing time (255.3±48.5 s; n=11) as compared to saline-treated animals (176.6±34.4 s; n=8). Pretreatment with the histamine biosynthesis inhibitor alpha-fluoromethylhistidine (5 µg, i.c.v.) prevented such effect (150.7±61.3 s, n=9). A reduction of freezing time was observed in oleoylethanolamide-treated rats after intra-BLA infusions with the H1R antagonist pyrilamine (0.9 µM 142.4±35.4 s, n=7) or H2R antagonist zolantidine (0.1 µM 132.5±51.7 s, n=10) as compared with controls (247.4±55.2 s, n=10). Using microdilysis technique we observed an increase of HA release (up to 120%, basal HA release, 66.8±23.1 fmol/15min, n=5) from the BLA of freely moving rats after oleoylethanolamide i.p. injection at the same dosage used in the behavioural paradigm. But not from the hypothalamic ventromedial and paraventricular nuclei, whereas it decreased histamine release from the prefrontal cortex and nucleus accumbens. The involvement of histamine in the BLA, in oleoylethanolamid-induced promnesic is suggested.