



Tiziana Rubino

 UNIVERSITY OF INSUBRIA



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Contact data

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Biography

Dr. Tiziana Rubino is an Assistant Professor of Pharmacology at the University of Insubria. She received her degree in Biology in 1988 from the University of Milan with a thesis on opioid receptor alterations in morphine tolerance. In 1989 she was awarded the "Premio Gamba" for the best experimental thesis in the pharmacological field for the past year. In 1992 she was visiting scientist at the Immunology laboratory of the "Istituto Scientifico dei Tumori" in Genoa, with a project on monoclonal antibodies production, and received her Ph.D. in Applied Biotechnology at the University of Milan. From 1995 to 1998 she received a fellowship from the Italian Ministry of Health on "Involvement of drug abuse in HIV progression". From 1999 to 2002 she received a postdoctoral fellowship from the University of Insubria on "Neurobiology of cannabinoids: behavioral and biochemical evidences underlying tolerance and dependence". From 2003 until the present she is researcher at the University of Insubria, School of Sciences. She is member of the Italian Society of Pharmacology and the International Cannabinoid Research Society.

Qualifications and awards

1988 Degree in Biological Sciences
1989 She was awarded "Premio Gamba"
1992 PhD in Applied Biotechnology

Research interests

Dr. Rubino's career-long interest is represented by drugs of abuse. Her degree dissertation was about opioid receptor alterations in morphine tolerance. Since then her attention is focused on the molecular mechanisms underlying tolerance and dependence to different drugs of abuse. At the beginning she studied opioid tolerance and showed that modifications in the amount of G proteins after chronic morphine treatment or the continuous infusion of selective opioid peptides represents part of the molecular underpinnings of opioid tolerance. A further change in G protein amounts that paralleled the behavioral manifestations of the abstinence syndrome was observed during opioid withdrawal strengthening the key role of G proteins in adaptation events following chronic treatment. She began working in the cannabinoid field in 1994 publishing on cannabinoid/opioid interaction at the CNS level. Then she focused her attention on the cellular effects in the CNS of in vivo chronic administration of natural and synthetic cannabinoids. Besides the demonstration of the occurrence of

behavioral tolerance and physical dependence to natural, synthetic and endogenous cannabinoids, she focused her attention on the cellular mechanisms underlying these phenomena, showing the relevance in specific brain areas of the alterations in receptor number and efficiency, and in cyclic AMP cascade. Recently, with a double approach (genetic and pharmacological) she demonstrated the relevance of the Ras/ERK cascade in the molecular events occurring after chronic THC treatment. Finally, she focused her attention on a more clinically relevant topic, that is to clarify the possible role that the cannabinoid system plays in the neurobiology of anxiety, in order to have new insights for the potential therapeutic use of cannabinoid compounds in anxiety treatment.

Teaching experience and appointments

Since 2001 she acts as a teacher for "Laboratory of Toxicology" for the undergraduate degree in Biology of Health.

Since 2005 she acts as a co-teacher for "Pharmacogenomics" for the graduate degree in Biology

She is a member of the Center of Neuroscience, University of Insubria, Busto Arsizio (VA)

She is member of the internship committee for the undergraduate in Health Biology and the second level Degree in Biology Applied to Biomedical Research

Representative publications

1. Vigano D, Rubino T, Parolaro D.

Molecular and cellular basis of cannabinoid and opioid interactions. *Pharmacol Biochem Behav.* 2005, 81: 360-368

2. Rubino T, Forlani G, Vigano D, Zippel R, Parolaro D.

Ras/ERK signalling in cannabinoid tolerance: from behaviour to cellular aspects. *J Neurochem.* 2005 May;93(4):984-91.

3. Vaccani A, Massi P, Colombo A, Rubino T, Parolaro D.

Cannabidiol inhibits human glioma cell migration through a cannabinoid receptor-independent mechanism. *Br J Pharmacol.* 2005 Apr;144(8):1032-6.

4. Vigano D, Rubino T., Vaccani A, Bianchessi S, Marmorato P, Castiglioni C, Parolaro D.

Molecular mechanisms involved in the asymmetric interaction between cannabinoid and opioid systems. *Neuropsychopharmacol.* 2005 vol. 182:527-536

5. Vigano D, Valenti M, Cascio MG, Di Marzo V, Parolaro D, Rubino T.

Changes in endocannabinoid levels in a rat model of behavioural sensitization to morphine. *Eur J Neurosci.* 2004 Oct;20(7):1849-57.

6. Valenti M, Vigano D, Casico MG, Rubino T, Steardo L, Parolaro D, Di Marzo V.

Differential diurnal variations of anandamide and 2-arachidonoyl-glycerol levels in rat brain. *Cell Mol Life Sci.* 2004 Apr;61(7-8):945-50

7. Rubino T, Forlani G, Vigano D, Zippel R, Parolaro D.

Modulation of extracellular signal-regulated kinases cascade by chronic delta 9-tetrahydrocannabinol treatment. *Mol Cell Neurosci.* 2004

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8. Rubino T., Viganò D., Massi P. and Parolaro D.

Cellular mechanisms of Delta 9-tetrahydrocannabinol behavioural sensitization". *Eur. J. Neurosci.* 2003 17 (2), 325-330.

9. Viganò D., Cascio M., Rubino T., Fezza F., Vaccani A., Di Marzo V. and Parolaro D.

Chronic morphine modulates the contents of the cannabinoid, 2-arachidonoyl glycerol, in rat brain. *Neuropsychopharmacol.* 2003, 28 (6), 1160-1167,.

10. Viganò D., Rubino T., Di Chiara G., Ascari I., Massi P. and Parolaro D.

Mu opioid receptor signaling in morphine sensitisation. *Neuroscience*, 117 (4), 921-929, 2003.

11. Massi P, Vaccani A, Rubino T, Parolaro D.

Cannabinoids and opioids share cAMP pathway in rat splenocytes. *J Neuroimmunol.* 2003 Dec;145(1-2):46-54,.

12. Parolaro D, Rubino T.

Is cannabinoid transmission involved in rewarding properties of drugs of abuse? *Br J Pharmacol.* 2002, 136(8):1083-4.

13. Parolaro D, Massi P, Rubino T, Monti E.

Endocannabinoids in the immune system and cancer. *Prostaglandins Leukot Essent Fatty Acids.* 2002 Feb-Mar;66(2-3):319-32.

14. Ponti W, Rubino T, Bardotti M, Poli G, Parolaro D.

Cannabinoids inhibit nitric oxide production in bone marrow derived feline macrophages. *Vet Immunol Immunopathol.* 2001 Oct;82(3-4):203-14.

15. Rubino T, Viganò D, Massi P, Parolaro D.

The psychoactive ingredient of marijuana induces behavioural sensitization. *Eur J Neurosci.* 2001 Sep;14(5):884-6

16. Rubino T, Viganò D, Costa B, Colleoni M, Parolaro D.

Loss of cannabinoid-stimulated guanosine 5'-O-(3-[(35)S] Thiotriphosphate) binding without receptor down-regulation in brain regions of anandamide-tolerant rats. *J Neurochem.* 2000 Dec;75 (6):2478-84.

17. Rubino T, Viganò D, Massi P, Parolaro D.

Changes in the cannabinoid receptor binding, G protein coupling, and cyclic AMP cascade in the CNS of rats tolerant to and dependent on the synthetic cannabinoid compound CP55,940. *J Neurochem.* 2000 Nov;75(5):2080-6.

18. Rubino T, Massi P, Viganò D, Fuzio D, Parolaro D.

Long-term treatment with SR141716A, the CB1 receptor antagonist, influences morphine withdrawal syndrome. *Life Sci.* 2000 Apr 21;66

(22):2213-9.

19. Rubino T, Vigano' D, Massi P, Spinello M, Zagato E, Giagnoni G, Parolaro D.
Chronic delta-9-tetrahydrocannabinol treatment increases cAMP levels and cAMP-dependent protein kinase activity in some rat brain regions. *Neuropharmacology*. 2000 Apr 27;39(7):1331-6.
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In vivo characterization of the specific cannabinoid receptor antagonist, SR141716A: behavioral and cellular responses after acute and chronic treatments. *Synapse*. 2000 Jan;35(1):8-14.
21. Bianchi M, Maggi R, Pimpinelli F, Rubino T, Parolaro D, Poli V, Ciliberto G, Panerai AE, Sacerdote P.
Presence of a reduced opioid response in interleukin-6 knock out mice. *Eur J Neurosci*. 1999 May;11(5):1501-7.
22. Massi P, Sacerdote P, Ponti W, Fuzio D, Manfredi B, Vigano D, Rubino T, Bardotti M, Parolaro D.
Immune function alterations in mice tolerant to delta9-tetrahydrocannabinol: functional and biochemical parameters. *J Neuroimmunol*. 1998 Dec 1;92(1-2):60-6.
23. Garcia-Gil L, Ramos JA, Rubino T, Parolaro D, Fernandez-Ruiz JJ.
Perinatal delta9-tetrahydrocannabinol exposure did not alter dopamine transporter and tyrosine hydroxylase mRNA levels in midbrain dopaminergic neurons of adult male and female rats. *Neurotoxicol Teratol*. 1998 Sep-Oct;20(5):549-53.
24. Rubino T, Patrini G, Massi P, Fuzio D, Vigano D, Giagnoni G, Parolaro D.
Cannabinoid-precipitated withdrawal: a time-course study of the behavioral aspect and its correlation with cannabinoid receptors and G protein expression. *J Pharmacol Exp Ther*. 1998 May;285(2):813-9.
25. Rubino T, Tizzoni L, Vigano D, Massi P, Parolaro D.
Modulation of rat brain cannabinoid receptors after chronic morphine treatment. *Neuroreport*. 1997 Oct 20;8(15):3219-23.
26. Massi P, Patrini G, Rubino T, Fuzio D, Parolaro D.
Changes in rat spleen cannabinoid receptors after chronic CP-55,940: an autoradiographic study. *Pharmacol Biochem Behav*. 1997 Sep;58(1):73-8.
27. Rubino T, Patrini G, Parenti M, Massi P, Parolaro D.
Chronic treatment with a synthetic cannabinoid CP-55,940 alters G-protein expression in the rat central nervous system. *Brain Res Mol Brain Res*. 1997 Mar;44(2):191-7.
28. Rubino T, Parenti M, Patrini G, Massi P, Parolaro D.
Morphine withdrawal syndrome and G protein expression: a study of the time course in the rat central nervous system. *Eur J Neurosci*. 1995

Nov 1;7(11):2334-40.

29. Rubino T, Massi P, Patrini G, Venier I, Giagnoni G, Parolaro D. Chronic CP-55,940 alters cannabinoid receptor mRNA in the rat brain: an in situ hybridization study. *Neuroreport*. 1994 Dec 20;5(18):2493-6.

30. Rubino T, Massi P, Patrini G, Venier I, Giagnoni G, Parolaro D. Effect of chronic exposure to naltrexone and opioid selective agonists on G protein mRNA levels in the rat nervous system. *Brain Res Mol Brain Res*. 1994 Jun;23(4):333-7.

Clinical interests

The potential clinical relevance of the completed research lies in possible applications for the therapy of drug dependence and of some psychiatric disorders such as anxiety