

## Emerging Designer Drug Monograph

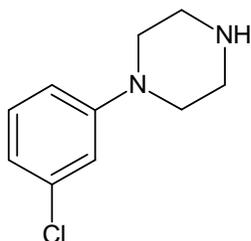
**Revision Date:** November 8, 2013

**Author(s):** Megan Record, Barry K. Logan

**Drug Name:** mCPP

**Synonyms:** meta-Chlorophenylpiperazine, 1-(3-chlorophenylpiperazine)

**Structure:**



**Formula:** C<sub>10</sub>H<sub>13</sub>ClN<sub>2</sub>

**Molecular Weight:** 196.7

**Pharmacological Drug Class:** mCPP is a derivative of piperazine designer drugs (10). mCPP does not have any addictive properties (5). mCPP is a metabolite for certain antidepressants such as nefazodone and trazodone (5). mCPP is the main ingredient 2% of the time of tablets, capsules, powders, usually in mixtures, it is not a prominent one though (3). The tablets can come in different sizes, shapes, colors, and with different logos on the tablets which are easily confused with ecstasy containing between 19 to 71 mg per tablet (5).

**Metabolism:** mCPP is a nonspecific serotonergic agonist that blocks the serotonin reuptake inhibitors that controls the impulse control (8). mCPP shows an affinity at 5-HT<sub>2C</sub> receptors (6).

**Blood Concentrations:** In a fatality case when a combination of a severe asthma attack and the treatment for the asthma attack; (which was triggered by the prior ingestion of a thought to be ecstasy tablet which actually contained mCPP) found less than 0.1 ng/g of mCPP in the deceased's hepatic blood and 15.0 ng/g in the urine. A woman died after ingesting 3 tablets containing mCPP and after taking cocaine, there was 320 ng/g of mCPP found in the woman's plasma (5). Doses of mCPP per tablet were reported as 27.6 ± 17.5 mg with the lowest dose being 1 mg and the highest of 83 mg per tablet (1).

**Effects and Toxicity:** In people that have anxiety disorders mCPP increases anxiety and panic attacks (6). Nausea and hallucinations are two of the biggest side effects from mCPP (1). mCPP has a brief anorexigenic effect related to its function at the 5-HT<sub>2C</sub> receptors (9). mCPP induces alcohol cravings which increased in people as their alcohol dependence increased (11). mCPP has been sold in the ecstasy market, mixed with MDMA and by itself claiming to be MDMA. The

mCPP and the mix of mCPP with MDMA causes a nausea effect. The mix of mCPP and MDMA also causes a less sociable and less entactogenic feelings (2). No neurotoxicity occurs because mCPP does not generate long-term depletion at cerebral levels like ecstasy does (5). Some adverse effects of mCPP are vomiting, headaches, hypomania, aggressive behavior, anxiety, dizziness, depression, and dyspnea (5).

**Analysis:** GC-NPD, GC-MS (2) GC-MS, LC-MS/MS, LC-MS/MS LC-coulometric electrochemical detection (840 mV), and LC-UV (5). UPLC/MS/MS is another technique used to detect mCPP (4). mCPP may show cross reactivity with CEDIA Amphetamine/Ecstasy assay (7).

### References:

1. Bossong, M.G., Brunt, T.M., Van Dijk, J.P., Rigter, S.M., Hoek, J., Goldschmidt, H. M. J., Niesink, R. J. M. (2010) mCPP: an undesired addition to the ecstasy market. *Journal of Psychopharmacology*, **24(9)**, 1395-1401.  
<http://www.ncbi.nlm.nih.gov/pubmed/19304863>
2. Brunt, T.M., Koeter, M.W., Niesink, R.J.M., Van den Brink, W. (2012) Linking the pharmacological content of ecstasy tablets to the subjective experiences of drug users. *Psychopharmacology*, **220**, 751-762.  
<http://www.ncbi.nlm.nih.gov/pubmed/21993879>
3. Byrska, B., Zuba, D. (2012) Prevalence and co-occurrence of active ingredients of 'legal highs'. *Proceedings of the Society of Forensic Toxicologists*, P192.  
[http://soft-tox.org/files/meeting\\_abstracts/SOFT\\_2012\\_meeting\\_abstracts.pdf](http://soft-tox.org/files/meeting_abstracts/SOFT_2012_meeting_abstracts.pdf)
4. Di Frazio, V., Wille, S. MR., Samyn, N. (2011) Simultaneous quantification of drugs of abuse in oral fluid collected with the statSure, Quantisal, or Certus device by UPLC-MS/MS. *Proceedings of the Society of Forensic Toxicologists and The International Association of Forensic Toxicologists*, O81.  
[http://soft-tox.org/files/meeting\\_abstracts/SOFT\\_2011\\_meeting\\_abstracts.pdf](http://soft-tox.org/files/meeting_abstracts/SOFT_2011_meeting_abstracts.pdf)
5. Gaillard, Y. P., Cuquel, A., Boucher, A., Romeuf, L., Bevalot, F., Prevosto, J., Menard, M. (2013) A fatality following ingestion of the designer drug meta-chlorophenylpiperazine (mCPP) in an asthmatic—HPLC-MS/MS detection in biofluids and hair. *Journal of Forensic Science*, **58(1)**, 263-269.  
<http://onlinelibrary.wiley.com/doi/10.1111/j.1556-4029.2012.02254.x/full>
6. Harvey, M.L., Swallows, C.L., Cooper, M.A. (2012) A double dissociation in the effects of 5-HT<sub>2A</sub> and 5-HT<sub>2C</sub> receptors on the acquisition and expression of conditioned defeat in Syrian hamsters. *Behavioral Neuroscience*, **126(4)**, 530-537.  
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3415988/>
7. McNamaral, S., Stokes, S., O'Byrne P., Kavanagh P. (2012) Positive CEDIA® amphetamine/ecstasy assay results arising from new psychoactive substances. *Proceedings of the Society of Forensic Toxicologists*, P17.  
[http://soft-tox.org/files/meeting\\_abstracts/SOFT\\_2012\\_meeting\\_abstracts.pdf](http://soft-tox.org/files/meeting_abstracts/SOFT_2012_meeting_abstracts.pdf)

8. Nardo, M., Casarotto, P.C., Gomes, F.V., Guimaraes, F.S.; Cannabidiol reverses the mCPP-induced increase in marble-burying behaviour; *Fundamental & Clinical Pharmacology*, October 25, 2013: 10.1111/fcp.12051  
<http://www.ncbi.nlm.nih.gov/pubmed/24118015>
9. Rivera, H.M., Santolloa, J., Nikonova, L.V., Eckela, L.A. (2012) Estradiol increases the anorexia associated with increased 5-HT<sub>2C</sub> receptor activation in ovariectomized rats. *Physiology & Behavior* **105**(2), 188-194.  
<http://www.sciencedirect.com/science/article/pii/S0031938411004033>
10. Staack, R. F., Maurer, H. H. (2005) Metabolism of designer drugs of abuse. *Current Drug Metabolism*, **6**, 259-274.  
<http://www.ncbi.nlm.nih.gov/pubmed/15975043>
11. Umhau, J.C., Schwandt, M.L., Usala, J., Geyer, C., Singley, E., George, D.T., Heilig, M. (2011) Pharmacologically induced alcohol craving in treatment seeking alcoholics correlates with alcoholism severity, but is insensitive to acamprosate. *Neuropsychopharmacology*, **36**, 1178-1186.  
<http://www.ncbi.nlm.nih.gov/pubmed/21289601>