1-(3-chlorophenyl) piperazine, or mCPP, is a piperazine metabolite of the drugs Trazodone (Desyrel®), Nefazodone (Serzone®), Mepiprazole (Psigodal®) and the discontinued drug, Etoperidone [1]. The piperazine class of drugs is a broad class of analytes that share a piperazine functional group (a six-membered ring containing two opposing nitrogen atoms). Many of these drugs act as antidepressants, antihistamines, antipsychotics, urologicals, and other recreational drugs of abuse [1]. mCPP is also a recreational drug that is available in tablet form, which is consumed orally, or powder form, which is snorted or injected [2]. Pharmacologically, mCPP acts as a serotonin receptor agonist, which leads to antidepressant and anxiolytic properties, as well as hallucinogenic side effects [3,4]. Due to its important pharmacological activity and potential abuse, the drug was added to AIT Laboratories’ comprehensive panel of drugs in 2008. In routine casework, mCPP has been detected in 266 postmortem cases and whole blood concentrations ranged from 5-1,325 ng/mL. Tissue (liver) specimen concentrations ranged from 1,722-27,831 ng/g. In every case, mCPP was detected with the presence of either Nefazodone (2 cases) or Trazodone (264 cases). Analytical reference standards can be purchased from Cerilliant Corporation (C-089), Sigma-Aldrich, Inc. (125180), and/or Toronto Research Chemicals, Inc. (C379590). A deuterated analog is also available from Toronto Research Chemicals, Inc. (C379592). mCPP is chemically related to other illicit piperazine drugs, such as BZP and TFMPP.

**General Information**

IUPAC Name: 1-(3-chlorophenyl)piperazine  
Common Name: 1-(m-chlorophenyl)piperazine; mCPP; m-CPP; 1-3-CPP  
Appearance: Research chemical is a pale orange oil or diluted in methanol  
Illicit drug is sold in tablet form in a variety of colors  
Chemical Formula: $C_{10}H_{13}ClN_2$  
Molecular Weight: 196.6 g/mol  
CAS Number: 6640-24-0  

**Pharmacology**

Half-Life: 2-7 hours  
Elimination: Eliminated in the urine as a hydroxylated metabolite and hydroxylated glucuronide conjugate [5]  
Mechanism of Action: Acts as an agonist for 5-HT receptors as well as the serotonin transporter protein; also has affinity for the $\alpha$-adrenergic receptors.

**Analytical Toxicology**

LC-ToF Screening Analysis: Following a protein precipitation extraction with acetonitrile; Limit of detection (LOD) is 1 ng/mL  
Theoretical accurate [M+H]$^+$ is 197.0846 (Figure 1)  
LC/MS/MS Confirmatory Analysis:  
 analysis: Following a protein precipitation with acetonitrile  
 Linearity 5 ng/mL – 2,000 ng/mL; Quadratic curve fit;  
 mCPP d8 as an internal standard  
 Quantitative MRM is 197.16 $\Rightarrow$ 118.20  
 Qualitative MRM is 197.16 $\Rightarrow$ 43.91 (Figure 2)  

Also can be detected by both GC/NPD & GC/MS with a routine basic drug screen:  
 Chlorobutane basic drug extraction with acidic back extraction  
 Detection on both the GC/NPD and GC/MS
NEW DRUG: meta-Chlorophenylpiperazine (mCPP)

GC/MS ions 154, 196, 156, 138 (Figure 3)
Relative retention time Buproprion, mCPP, Meperidine, Diphenhydramine
Quantitative method validation not performed

References
NEW DRUG: meta-Chlorophenylpiperazine (mCPP)

Figure 3 – EI Mass Spectra of mCPP