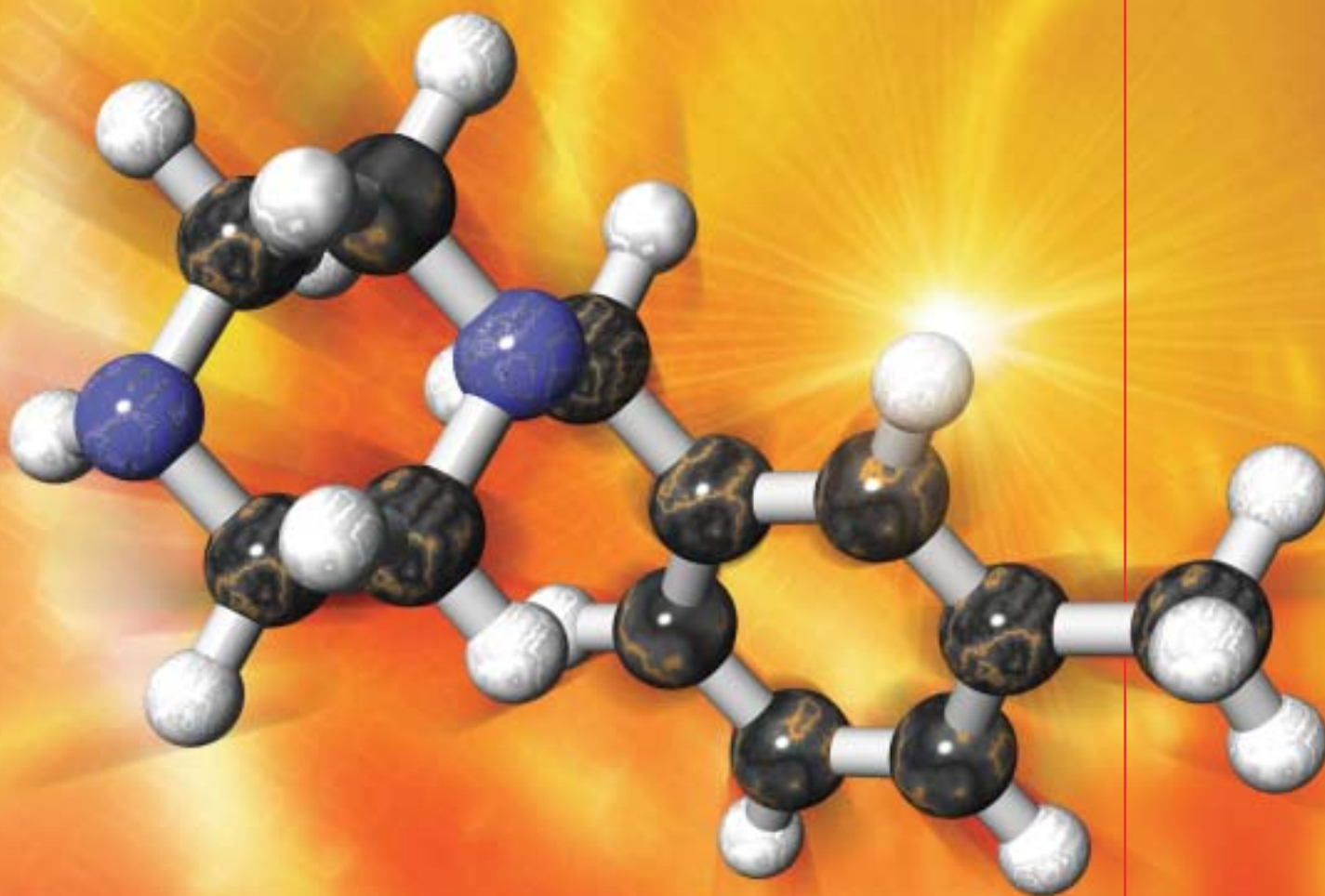


Privileged Structures for Lead
Discovery and Optimization

Piperazines



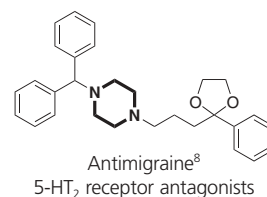
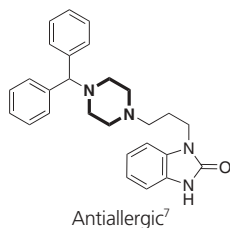
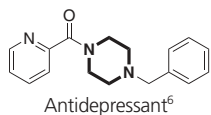
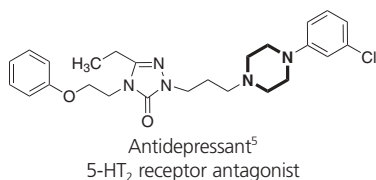
Introduction

Sigma-Aldrich is pleased to offer the third installment of our Privileged Structures *ChemFiles*. This piece will focus on the piperazine scaffold. We will discuss application data, Sigma-Aldrich building blocks that have been highlighted in the recent literature, and the piperazine products that Sigma-Aldrich offers. If you do not see a particular product listed or have a product suggestion, please email us at DrugDiscovery@sial.com. If you did not receive the previous installments of the Privileged Structures *ChemFiles*, you may download a copy at sigma-aldrich.com/chemfiles.

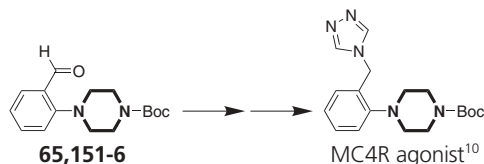
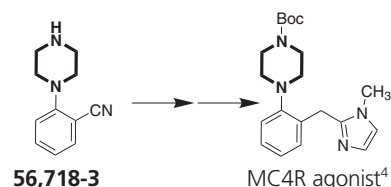
Privileged Structures are defined as molecules that are capable of binding to multiple receptors with high affinity. In order for a scaffold to be considered privileged, a substructure needs to represent a molecule's core element and make up a significant portion of its total mass. The main function of privileged structures is to provide a way for medicinal chemists to build a library based on one core scaffold and screen it against an assortment of different receptors.¹

The piperazine scaffold has been classified as a privileged structure and is frequently found in biologically active compounds across a number of different therapeutic areas.² Some of these therapeutic areas include antifungals, antidepressants, antiviral, and serotonin receptor (5-HT) antagonists/agonists.

The therapeutic area that is the subject of intense research is the 5-HT receptors. These receptors belong to the G-protein-coupled receptor (GPCR) superfamily and represent the molecular target for over 45% of all marketed drugs. It is estimated that one-third of all pharmaceutical research is focused on these receptors. This selectivity of piperazines towards GPCRs has been attributed to its basicity.³ Recent SAR studies by Richardson et al. also demonstrated that increasing the size of the ortho substituent resulted in an increase in binding affinity and functional potency.⁴



Recent literature has highlighted piperazine building blocks that are available from Sigma-Aldrich. Two examples are 1-(2-cyanophenyl)piperazine⁴ (Cat No **56,718-3**) and 1-Boc-4-(2-formylphenyl)piperazine¹⁰ (Cat No **65,151-6**). Both compounds have been used in the synthesis of melanocortin subtype-4 receptor (MC4R) agonists. MC4R is located in the hypothalamus and helps to regulate metabolism, feeding and reproductive behavior. Agonists to these receptors have shown to decrease feeding behaviors.⁹



Sigma-Aldrich has a large selection of piperazine compounds that can be used as building blocks for organic synthesis and medicinal chemistry. Listed on the following pages are some of the piperazines that are available from Sigma-Aldrich. For a complete list of piperazines, please visit our Web site at sigma-aldrich.com/drugdiscovery.

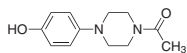
References

1. D. A. Horton et al. *Chem. Rev.* **2003**, *103*, 893–930.
2. M. Berkheij et al. *Tetrahedron Lett.* **2005**, *15*, 2369–2371.
3. A. O. Stewart et al. *J. Med. Chem.* **2004**, *47*, 2348–2355.
4. T. I. Richardson et al. *J. Med. Chem.* **2004**, *47*, 744–755.
5. Mead Johnson and Company, US-4338317 **1982**.
6. EGYT, US-3865828 **1975**.
7. Janssen Pharmaceutica N.V., US-4250176 **1981**.
8. Ferrer Internacional, S.A., US-4883797 **1989**.
9. C. Fotsch et al. *Bioorg. Med. Chem. Lett.* **2005**, *15*, 1623–1627.
10. B. Dyck et al. *Bioorg. Med. Chem. Lett.* **2003**, *13*, 3793–3796.

TO ORDER: Contact your local Sigma-Aldrich office (see back cover), call 1-800-325-3010 (USA), or visit sigma-aldrich.com.

1-Acetyl-4-(4-hydroxyphenyl)piperazine, 98%

C₁₂H₁₆N₂O₂
FW 220.27
[67914-60-7]



511943-25G	25 g
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1-Acetyl piperazine, 99%

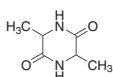
C₆H₁₂N₂O
FW 128.17
[13889-98-0]



359513-5G	5 g
359513-25G	25 g

Alanine anhydride, mixture of DL and meso, 99%

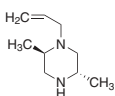
C₆H₁₀N₂O₂
FW 142.16
[5625-46-7]



362557-5G	5 g
362557-25G	25 g

(±)-trans-1-Allyl-2,5-dimethylpiperazine, 97%

C₉H₁₈N₂
FW 154.25
[155766-33-9]



578118-1G	1 g
578118-5G	5 g

1-Allylpiperazine, 96%

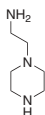
C₇H₁₄N₂
FW 126.2
[13961-36-9]



566888-1G	1 g
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1-(2-Aminoethyl)piperazine, 99%

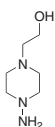
C₆H₁₅N₃
FW 129.2
[140-31-8]



A55209-5G	5 g
A55209-100G	100 g
A55209-500G	500 g

1-Amino-4-(2-hydroxyethyl)piperazine, 96%

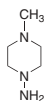
C₆H₁₅N₃O
FW 145.2
[3973-70-4]



122963-1G	1 g
122963-5G	5 g

1-Amino-4-methylpiperazine, 97%

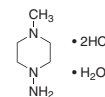
C₅H₁₃N₃
FW 115.18
[6928-85-4]



255688-25G	25 g
255688-100G	100 g

1-Amino-4-methylpiperazine dihydrochloride monohydrate, 97%

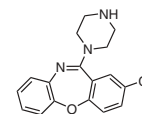
C₅H₁₃N₃ · 2HCl · H₂O
FW 206.11
[40675-60-3]



A65131-1G	1 g
A65131-10G	10 g

Amoxapine

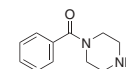
C₁₇H₁₆ClN₃O
FW 313.78
[14028-44-5]



A129-100MG	100 mg
A129-500MG	500 mg
A129-5G	5 g

1-Benzoylpiperazine, 97%

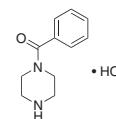
C₁₁H₁₄N₂O
FW 190.24
[73754-38-6]



571083-1G	1 g
571083-5G	5 g

1-Benzoylpiperazine hydrochloride, 97%

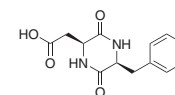
C₁₁H₁₄N₂O · HCl
FW 226.7
[56227-55-5]



592714-1G	1 g
592714-5G	5 g

(2S-cis)-(-)-5-Benzyl-3,6-dioxo-2-piperazineacetic acid, 99%

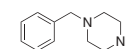
C₁₃H₁₄N₂O₄
FW 262.26
[5262-10-2]



421650-250MG	250 mg
421650-1G	1 g

1-Benzylpiperazine, 98%

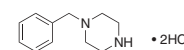
C₁₁H₁₆N₂
FW 176.26
[2759-28-6]



B3059-5G	5 g
B3059-100G	100 g
B3059-1KG	1 kg

1-Benzylpiperazine dihydrochloride, 95%

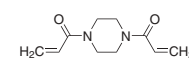
C₁₁H₁₆N₂ · 2HCl
FW 249.18
[5321-63-1]



B2934-5G	5 g
B2934-100G	100 g
B2934-1KG	1 kg

1,4-Bis(acryloyl)piperazine, 99+%

C₁₀H₁₄N₂O₂
FW 194.23
[6342-17-2]



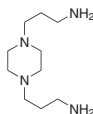
542350-1G	1 g
542350-5G	5 g



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1,4-Bis(3-aminopropyl)piperazine, 99+%

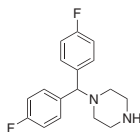
C₁₀H₂₄N₄
FW 200.32
[7209-38-3]



239488-10ML	10 mL
239488-50ML	50 mL

1-Bis(4-fluorophenyl)methylpiperazine, 97%

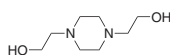
C₁₇H₁₈F₂N₂
FW 288.34
[27469-60-9]



552402-1G	1 g
552402-5G	5 g

1,4-Bis(2-hydroxyethyl)piperazine, 99%

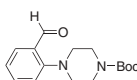
C₈H₁₈N₂O₂
FW 174.24
[122-96-3]



B45402-5G	5 g
B45402-25G	25 g
B45402-100G	100 g

1-Boc-4-(2-formylphenyl)piperazine, 97%

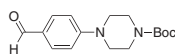
C₁₆H₂₂N₂O₃
FW 290.36
[174855-57-3]



651516-1G	1 g
651516-5G	5 g

1-Boc-4-(4-formylphenyl)piperazine, 97%

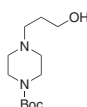
C₁₆H₂₂N₂O₃
FW 290.36
[197638-83-8]



651427-1G	1 g
651427-5G	5 g

1-Boc-4-(3-hydroxypropyl)piperazine, 97%

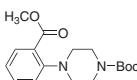
C₁₂H₂₄N₂O₃
FW 244.33



643467-5G	5 g
643467-25G	25 g

1-Boc-4-(2-Methoxycarbonylphenyl)piperazine

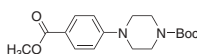
C₁₇H₂₄N₂O₄
FW 320.38



652377-1G	1 g
652377-5G	5 g

1-Boc-4-(4-methoxycarbonylphenyl)piperazine, 97%

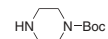
C₁₇H₂₄N₂O₄
FW 320.38
[158985-36-5]



652385-1G	1 g
652385-5G	5 g

1-Boc-piperazine, 97%

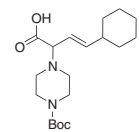
C₉H₁₈N₂O₂
FW 186.25
[57260-71-6]



343536-1G	1 g
343536-5G	5 g
343536-25G	25 g

(E)-2-(4-Boc-piperazin-1-yl)-4-cyclohexyl-3-butenic acid, 97%

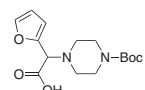
C₁₉H₃₂N₂O₄
FW 352.47



654906-1G	1 g
654906-5G	5 g

2-(4-Boc-piperazin-1-yl)-2-(furan-2-yl)acetic acid, 97%

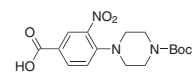
C₁₅H₂₂N₂O₅
FW 310.35



653330-1G	1 g
653330-5G	5 g

4-(Boc-piperazin-1-yl)-3-nitrobenzoic acid, 97%

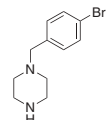
C₁₆H₂₁N₃O₆
FW 351.35



651923-1G	1 g
651923-5G	5 g

1-(4-Bromobenzyl)piperazine, 97.0%

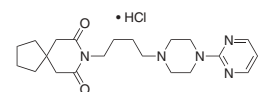
C₁₁H₁₅BrN₂
FW 255.15
[91345-62-9]



04695-1G	1 g
04695-5G	5 g

Buspirone hydrochloride

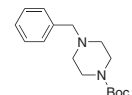
C₂₁H₃₁N₅O₂ · HCl
FW 421.96
[33386-08-2]



B7148-1G	1 g
B7148-5G	5 g

1-Boc-(4-benzyl)piperazine

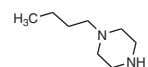
C₁₆H₂₄N₂O₂
FW 276.37
[57260-70-5]



374830-1G	1 g
374830-5G	5 g

1-Butylpiperazine, 97.0%

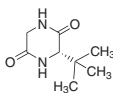
C₈H₁₈N₂
FW 142.24
[5610-49-1]



77887-5G	5 g
77887-25G	25 g

(S)-3-tert-Butyl-2,5-piperazinedione, 99.0%

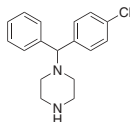
C₈H₁₄N₂O₂
FW 170.21
[65050-07-9]



20550-250MG	250 mg	
20550-1G	1 g	

1-(4-Chlorobenzhydryl)piperazine, 90%

C₁₇H₁₉ClN₂
FW 286.8
[303-26-4]

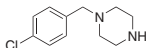


C24507-250MG	250 mg	
C24507-1G	1 g	

1-(4-Chlorobenzyl)piperazine, 98%

NEW

C₁₁H₁₅ClN₂
FW 210.7
[23145-88-2]

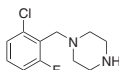


650218-1G	1 g	
650218-5G	5 g	

1-(2-Chloro-6-fluorobenzyl)piperazine, 98%

NEW

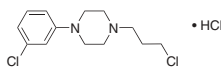
C₁₁H₁₄ClFN₂
FW 228.69
[215655-20-2]



650156-1G	1 g	
650156-10G	10 g	

1-(3-Chlorophenyl)-4-(3-chloropropyl)piperazine monohydrochloride, 97%

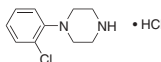
C₁₃H₁₈Cl₂N₂ · HCl
FW 309.66
[52605-52-4]



363464-25G	25 g	
363464-100G	100 g	

1-(2-Chlorophenyl)piperazine monohydrochloride, 98%

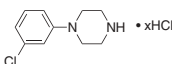
C₁₀H₁₃ClN₂ · HCl
FW 233.14
[41202-32-8]



C67605-10G	10 g	
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1-(3-Chlorophenyl)piperazine hydrochloride

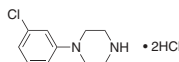
C₁₀H₁₃ClN₂ · xHCl
FW 196.68
[65369-76-8]



125180-5G	5 g	
125180-25G	25 g	

1-(3-Chlorophenyl)piperazine dihydrochloride

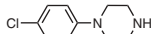
C₁₀H₁₃ClN₂ · 2HCl
FW 269.6
[51639-49-7]



S014-1G	1 g	
S014-5G	5 g	

1-(4-Chlorophenyl)piperazine, 98.0%

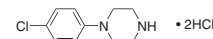
C₁₀H₁₃ClN₂
FW 196.68
[38212-33-8]



73659-1G	1 g	
73659-5G	5 g	

1-(4-Chlorophenyl)piperazine dihydrochloride, 95%

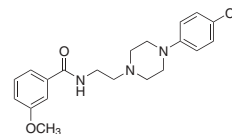
C₁₀H₁₃ClN₂ · 2HCl
FW 269.6
[38869-46-4]



C68008-5G	5 g	
C68008-25G	25 g	

N-[2-(4-(4-Chlorophenyl)piperazin-1-yl)ethyl]-3-methoxybenzamide

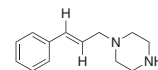
C₂₀H₂₄N₃O₂
FW 373.88



C7230-5MG	5 mg	
C7230-25MG	25 mg	

trans-1-Cinnamylpiperazine, 97%

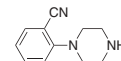
C₁₃H₁₈N₂
FW 202.3
[87179-40-6]



404470-10G	10 g	
404470-50G	50 g	

1-(2-Cyanophenyl)piperazine, 99%

C₁₁H₁₃N₃
FW 187.24
[111373-03-6]

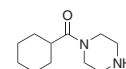


567183-1G	1 g	
567183-5G	5 g	

1-(Cyclohexylcarbonyl)piperazine, 97%

NEW

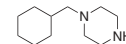
C₁₁H₂₀N₂O
FW 196.29
[27561-62-2]



647128-1G	1 g	
647128-5G	5 g	

1-(Cyclohexylmethyl)piperazine, 97%

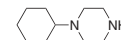
C₁₁H₂₂N₂
FW 182.31
[57184-23-3]



566535-1G	1 g	
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1-Cyclohexylpiperazine, 97.0%

C₁₀H₂₀N₂
FW 168.28
[17766-28-8]

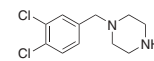


75475-5G	5 g	
75475-25G	25 g	

1-(3,4-Dichlorobenzyl)piperazine, 97%

NEW

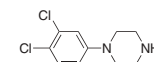
C₁₁H₁₄Cl₂N₂
FW 245.15
[55513-17-2]



644269-1G	1 g	
644269-5G	5 g	

1-(3,4-Dichlorophenyl)piperazine, 99.0%

C₁₀H₁₂Cl₂N₂
FW 231.12
[57260-67-0]



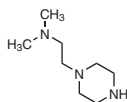
55927-5G	5 g	
55927-25G	25 g	



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1-[2-(Dimethylamino)ethyl]piperazine, 98.0%

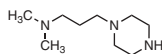
C₈H₁₉N₃
FW 157.26
[3644-18-6]



74328-1G	1 g
74328-5G	5 g

1-[3-(Dimethylamino)propyl]piperazine, 98.0%

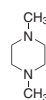
C₉H₂₁N₃
FW 171.28
[877-96-3]



94663-1G	1 g
94663-5G	5 g

1,4-Dimethylpiperazine, 98%

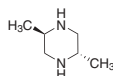
C₆H₁₄N₂
FW 114.19
[106-58-1]



D179302-5G	5 g
D179302-100G	100 g

trans-2,5-Dimethylpiperazine, 98%

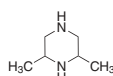
C₆H₁₄N₂
FW 114.19
[2815-34-1]



D179604-1G	1 g
D179604-5G	5 g

2,6-Dimethylpiperazine, predominantly cis, 97%

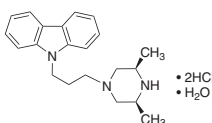
C₆H₁₄N₂
FW 114.19
[108-49-6]



D179809-1G	1 g
D179809-5G	5 g
D179809-25G	25 g

9-[3-(cis-3,5-Dimethyl-1-piperazinyl)propyl]carbazole dihydrochloride monohydrate, 97%

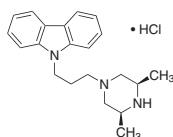
C₂₁H₂₇N₃ · 2HCl · H₂O
FW 412.4
[207233-98-5]



346438-1G	1 g
346438-5G	5 g

9-[3-(cis-3,5-Dimethyl-1-piperazinyl)propyl]carbazole monohydrochloride, 90%

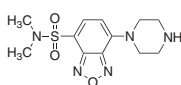
C₂₁H₂₇N₃ · HCl
FW 357.92
[75859-05-1]



361208-1G	1 g
361208-5G	5 g

4-(N,N-Dimethylsulfamoyl)-7-piperazino-benzofurazan, 99.0%

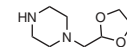
C₁₂H₁₇N₅O₃S
FW 311.36
[139332-64-2]



93087-50MG	50 mg
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1-(1,3-Dioxolan-2-ylmethyl)piperazine, 97.0%

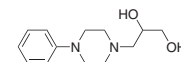
C₈H₁₆N₂O₂
FW 172.22



70516-1G	1 g
70516-5G	5 g

(±)-Dropropizine

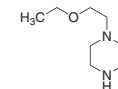
C₁₃H₂₀N₂O₂
FW 236.31
[17692-31-8]



D4285-5G	5 g
D4285-10G	10 g

1-(2-Ethoxyethyl)piperazine, 97%

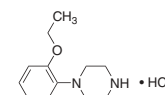
C₈H₁₈N₂O
FW 158.24
[13484-38-3]



566861-1G	1 g
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1-(2-Ethoxyphenyl)piperazine monohydrochloride, 98%

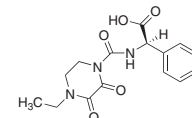
C₁₂H₁₈N₂O · HCl
FW 242.75
[83081-75-8]



275174-25G	25 g
275174-100G	100 g

(R)-(-)-α-[[[4-Ethyl-2,3-dioxo-1-piperazinyl]carbonyl]amino]-benzeneacetic acid, 97%

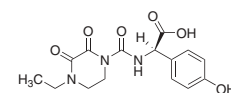
C₁₅H₁₇N₃O₅
FW 319.31
[63422-71-9]



472891-1G	1 g
472891-5G	5 g

(R)-(-)-α-[[[4-Ethyl-2,3-dioxo-1-piperazinyl]carbonyl]amino]-4-hydroxybenzeneacetic acid, 97%

C₁₅H₁₇N₃O₆
335.31
[62893-24-7]



472905-1G	1 g
472905-5G	5 g

1-Ethylpiperazine, 98%

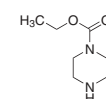
C₆H₁₄N₂
FW 114.19
[5308-25-8]



415308-50ML	50 mL
415308-250ML	250 mL

Ethyl 1-piperazinecarboxylate, 99%

C₇H₁₄N₂O₂
FW 158.2
[120-43-4]



E45600-25G	25 g
E45600-100G	100 g

N-Ethylpiperazine-2,3-dione, 97%

C₆H₁₀N₂O₂
FW 142.16
[59702-31-7]

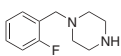


535044-25G	25 g	
535044-100G	100 g	

1-(2-Fluorobenzyl)piperazine, 96%

NEW

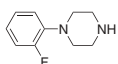
C₁₁H₁₅FN₂
FW 194.25
[89292-78-4]



650242-1G	1 g	
650242-5G	5 g	

1-(2-Fluorophenyl)piperazine, 97%

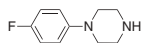
C₁₀H₁₃FN₂
FW 180.22
[1011-15-0]



444804-10ML	10 mL	
444804-50ML	50 mL	

1-(4-Fluorophenyl)piperazine, 98%

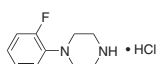
C₁₀H₁₃FN₂
FW 180.22
[2252-63-3]



191337-10G	10 g	
191337-50G	50 g	

1-(2-Fluorophenyl)piperazine monohydrochloride, 98%

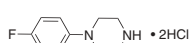
C₁₀H₁₃FN₂ · HCl
FW 216.68
[1011-16-1]



375306-5G	5 g	
375306-25G	25 g	

1-(4-Fluorophenyl)piperazine dihydrochloride, 98%

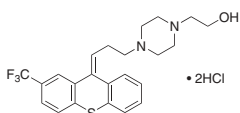
C₁₀H₁₃FN₂ · 2HCl
FW 253.14
[64090-19-3]



301280-25G	25 g	
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cis-(Z)-Flupentixol dihydrochloride

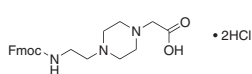
C₂₃H₂₅F₃N₂OS · 2HCl
FW 507.44
[2709-56-0]



F114-100MG	100 mg	
F114-500MG	500 mg	

4-[2-(Fmoc-amino)ethyl]piperazin-1-ylacetic acid dihydrochloride, 98.0%

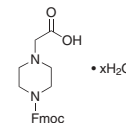
C₂₃H₂₇N₃O₄ · 2HCl
FW 482.4
[204320-65-0]



47548-250MG	250 mg	
47548-1G	1 g	

4-Fmoc-1-piperazineacetic acid hydrate, 97.0%

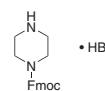
C₂₁H₂₂N₂O₄ · xH₂O
FW 366.41
[180576-05-0]



47553-250MG	250 mg	
47553-1G	1 g	

1-Fmoc-piperazine hydrobromide, 98.0%

C₁₉H₂₀N₂O₂ · HBr
FW 389.29



47800-1G	1 g	
47800-5G	5 g	

1-Formylpiperazine, 85%

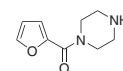
C₅H₁₀N₂O
FW 114.15
[7755-92-2]



392243-25ML	25 mL	
392243-100ML	100 mL	

1-(2-Furoyl)piperazine, 97%

C₉H₁₂N₂O₂
FW 180.2
[40172-95-0]



558966-5G	5 g	
558966-25G	25 g	

Glycine anhydride

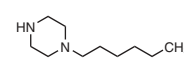
C₄H₆N₂O₂
FW 114.1
[106-57-0]



G7251-25G	25 g	
G7251-100G	100 g	
G7251-1KG	1 kg	

1-Hexylpiperazine, 98.0%

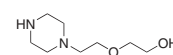
C₁₀H₂₂N₂
FW 170.3
[51619-55-7]



94817-5G	5 g	
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1-[2-(2-Hydroxyethoxy)ethyl]piperazine, 95%

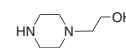
C₈H₁₈N₂O₂
FW 174.24
[13349-82-1]



331260-5G	5 g	
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1-(2-Hydroxyethyl)piperazine, 98%

C₆H₁₄N₂O
FW 130.19
[103-76-4]



H28807-5G	5 g	
H28807-100G	100 g	
H28807-500G	500 g	

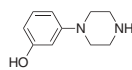


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1-(3-Hydroxyphenyl)piperazine, 97%

NEW

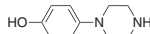
C₁₀H₁₄N₂O
FW 178.23
[59817-32-2]



651672-1G	1 g
651672-5G	5 g

1-(4-Hydroxyphenyl)piperazine, 98.0%

C₁₀H₁₄N₂O
FW 178.23
[56621-48-8]



77732-1G	1 g
77732-5G	5 g

1-Isopropylpiperazine, 97%

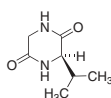
C₇H₁₆N₂
FW 128.22
[4318-42-7]



566853-1G	1 g
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(R)-(-)-3-Isopropyl-2,5-piperazinedione, 97%

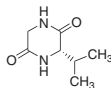
C₇H₁₂N₂O₂
FW 156.18
[143673-66-9]



448362-1G	1 g
448362-5G	5 g

(S)-3-Isopropyl-2,5-piperazinedione, 99.0%

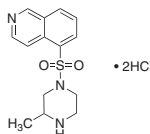
C₇H₁₂N₂O₂
FW 156.18
[16944-60-8]



59732-1G	1 g
59732-5G	5 g

1-(5-Isoquinolinylsulfonyl)-3-methylpiperazine dihydrochloride, 99.0%

C₁₄H₁₇N₃O₂S · 2HCl
FW 364.29
[140663-38-3]

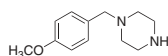


58758-5MG	5 mg
58758-25MG	25 mg

1-(4-Methoxybenzyl)piperazine, 97%

NEW

C₁₂H₁₈N₂O
FW 206.28
[21867-69-6]



646156-1G	1 g
646156-5G	5 g

1-(2-Methoxyethyl)piperazine, 97%

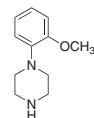
C₇H₁₆N₂O
FW 144.21
[13484-40-7]



571423-1G	1 g
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1-(2-Methoxyphenyl)piperazine, 98%

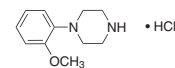
C₁₁H₁₆N₂O
FW 192.26
[35386-24-4]



M22601-5G	5 g
M22601-25G	25 g

1-(2-Methoxyphenyl)piperazine hydrochloride, 97%

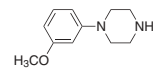
C₁₁H₁₆N₂O · HCl
FW 228.72
[5464-78-8]



270067-100G	100 g
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1-(3-Methoxyphenyl)piperazine, 95%

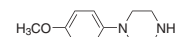
C₁₁H₁₆N₂O
FW 192.26
[16015-71-7]



471682-5G	5 g
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1-(4-Methoxyphenyl)piperazine, 97%

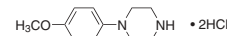
C₁₁H₁₆N₂O
FW 192.26
[38212-30-5]



571415-1G	1 g
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1-(4-Methoxyphenyl)piperazine dihydrochloride, 90%

C₁₁H₁₆N₂O · 2HCl
FW 265.18
[38869-47-5]

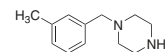


M23004-5G	5 g
M23004-25G	25 g

1-(3-Methylbenzyl)piperazine, 97%

NEW

C₁₂H₁₈N₂
FW 190.28
[5321-48-2]

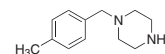


648523-1G	1 g
648523-5G	5 g

1-(4-Methylbenzyl)piperazine, 97%

NEW

C₁₂H₁₈N₂
FW 190.28
[23173-57-1]

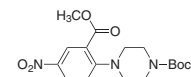


646172-1G	1 g
646172-5G	5 g

1-Boc-4-(2-methoxycarbonyl-4-nitrophenyl)piperazine

NEW

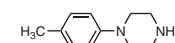
C₁₇H₂₃N₃O₆
FW 365.38



651931-1G	1 g
651931-5G	5 g

1-(4-Methylphenyl)piperazine, 98.0%

C₁₁H₁₆N₂
FW 176.26
[39593-08-3]

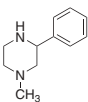


71868-5G	5 g
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1-Methyl-3-phenylpiperazine, 97%

NEW

C₁₁H₁₆N₂
FW 176.26
[5271-27-2]



648434-1G	1 g	
648434-5G	5 g	

1-Methylpiperazine, 99%

C₅H₁₂N₂
FW 100.16
[109-01-3]



130001-5G	5 g	
130001-100G	100 g	
130001-500G	500 g	

1-Methylpiperazine dihydrochloride, 98%

C₅H₁₂N₂ · 2HCl
FW 173.08
[34352-59-5]



278793-25G	25 g	
278793-100G	100 g	

2-Methylpiperazine, 95%

C₅H₁₂N₂
FW 100.16
[109-07-9]



M72404-25G	25 g	
M72404-100G	100 g	

(R)-(-)-2-Methylpiperazine, 99%

C₅H₁₂N₂
FW 100.16
[75336-86-6]



397164-250MG	250 mg	
397164-1G	1 g	

(S)-(+)-2-Methylpiperazine, 99%

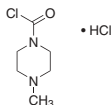
C₅H₁₂N₂
FW 100.16
[74879-18-8]



397172-1G	1 g	
397172-5G	5 g	

4-Methyl-1-piperazinecarbonyl chloride hydrochloride, 97%

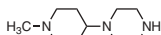
C₆H₁₁ClN₂O · HCl
FW 199.08
[55112-42-0]



515027-25G	25 g	
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1-(1-Methyl-4-piperidinyl)piperazine, 98.0%

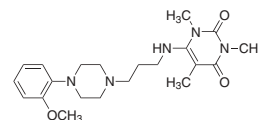
C₁₀H₂₁N₃
FW 183.29
[23995-88-2]



71277-1G	1 g	
71277-5G	5 g	

5-Methylurapidil

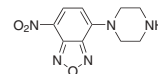
C₂₁H₃₁N₅O₃
FW 401.5
[34661-85-3]



U101-10MG	10 mg	
U101-50MG	50 mg	
U101-250MG	250 mg	

4-Nitro-7-piperazinobenzofurazan, 99.0%

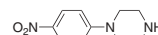
C₁₀H₁₁N₅O₃
FW 249.23
[139332-66-4]



92614-100MG	100 mg	
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1-(4-Nitrophenyl)piperazine, 97%

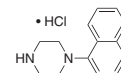
C₁₀H₁₃N₃O₂
FW 207.23
[6269-89-2]



279773-5G	5 g	
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1-(1-Naphthyl)piperazine hydrochloride

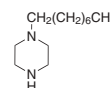
C₁₄H₁₆N₂ · HCl
FW 248.75



S003-100MG	100 mg	
S003-500MG	500 mg	

1-Octylpiperazine, 97%

C₁₂H₂₆N₂
FW 198.35
[54256-45-0]



566896-1G	1 g	
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2-Oxopiperazine, 97%

NEW

C₄H₈N₂O
FW 100.12
[5625-67-2]



641065-1G	1 g	
641065-5G	5 g	

1-(2-Phenylethyl)piperazine, 97%

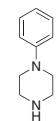
C₁₂H₁₈N₂
FW 190.28
[5321-49-3]



571458-1G	1 g	
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1-Phenylpiperazine, 99%

C₁₀H₁₄N₂
FW 162.23
[92-54-6]



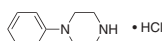
P30004-25G	25 g	
P30004-100G	100 g	



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1-Phenylpiperazine hydrochloride, 99%

$C_{10}H_{14}N_2 \cdot HCl$
FW 198.69
[2210-93-7]



281891-25G	25 g
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2-Phenylpiperazine, 96%

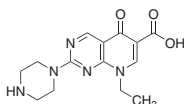
$C_{10}H_{14}N_2$
FW 162.23
[5271-26-1]



638641-5G	5 g
638641-25G	25 g

Pipemidic acid

$C_{14}H_{17}N_5O_3$
FW 303.32
[51940-44-4]



P7903-10G	10 g
P7903-100G	100 g

Piperazine, 99%

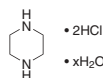
$C_4H_{10}N_2$
FW 86.14
[110-85-0]



P45907-5G	5 g
P45907-100G	100 g
P45907-500G	500 g

Piperazine dihydrochloride hydrate, 98%

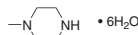
$C_4H_{10}N_2 \cdot 2HCl \cdot xH_2O$
FW 159.06
[6091-62-9]



284904-5G	5 g
284904-250G	250 g
284904-1KG	1 kg

Piperazine hexahydrate, 98.0%

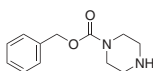
$C_4H_{10}N_2 \cdot 6H_2O$
FW 194.23
[142-63-2]



P7003-200G	200 g
P7003-1KG	1 kg

1-Z-Piperazine, 98%

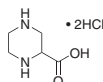
$C_{12}H_{16}N_2O_2$
FW 220.27
[31166-44-6]



456926-5ML	5 mL
456926-25ML	25 mL

(±)-Piperazine-2-carboxylic acid dihydrochloride, 98%

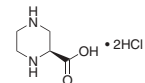
$C_5H_{10}N_2O_2 \cdot 2HCl$
FW 203.07
[3022-15-9]



484903-5G	5 g
484903-25G	25 g

(S)-2-Piperazinecarboxylic acid dihydrochloride, 98.0%

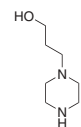
$C_5H_{10}N_2O_2 \cdot 2HCl$
FW 203.07
[158663-69-5]



03567-5G	5 g
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1-Piperazinepropanol

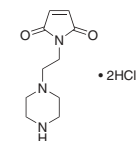
$C_7H_{16}N_2O$
FW 144.21
[5317-32-8]



641642-1G	1 g
641642-5G	5 g

N-(2-Piperazinoethyl)maleimide dihydrochloride, 99.0%

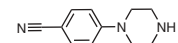
$C_{10}H_{15}N_3O_2 \cdot 2HCl$
FW 282.17
[190714-38-6]



80675-100MG	100 mg
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4-Piperazinobenzonitrile, 97.0%

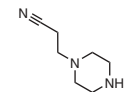
$C_{11}H_{13}N_3$
FW 187.24
[68104-63-2]



95516-1G	1 g
95516-5G	5 g

3-Piperazinopropionitrile, 97.0%

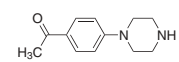
$C_7H_{13}N_3$
FW 139.2
[34064-86-3]



95947-1G	1 g
95947-5G	5 g

4'-Piperazinoacetophenone, 94%

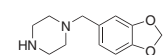
$C_{12}H_{16}N_2O$
FW 204.27
[51639-48-6]



136468-1G	1 g
136468-5G	5 g
136468-25G	25 g

1-Piperonylpiperazine, 97%

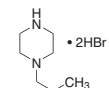
$C_{12}H_{16}N_2O_2$
FW 220.27
[32231-06-4]



224952-25G	25 g
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1-N-Propylpiperazine dihydrobromide, 96%

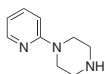
$C_7H_{16}N_2 \cdot 2HBr$
FW 290.04
[64262-23-3]



141674-25G	25 g
141674-100G	100 g

1-(2-Pyridyl)piperazine, 99.5+%

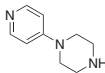
C₉H₁₃N₃
FW 163.22
[34803-66-2]



408166-5ML	5 mL	
408166-25ML	25 mL	

1-(4-Pyridyl)piperazine, 97.0%

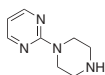
C₉H₁₃N₃
FW 163.22



76763-1G	1 g	
76763-5G	5 g	

1-(2-Pyrimidyl)piperazine, 98%

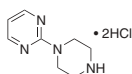
C₈H₁₂N₄
FW 164.21
[20980-22-7]



421235-5G	5 g	
421235-25G	25 g	

1-(2-Pyrimidyl)piperazine dihydrochloride, 98%

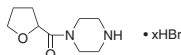
C₈H₁₂N₄ · 2HCl
FW 237.13
[94021-22-4]



275360-5G	5 g	
275360-25G	25 g	
275360-100G	100 g	

1-(2-Tetrahydrofuroyl)piperazine hydrobromide

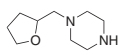
C₉H₁₆N₂O₂ · xHBr
FW 184.24
[63590-62-5]



570990-1G	1 g	
570990-5G	5 g	

1-(Tetrahydro-2-furylmethyl)piperazine, 98.0%

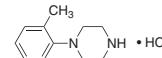
C₉H₁₈N₂O
FW 170.25
[82500-35-4]



71276-1G	1 g	
71276-5G	5 g	

1-(o-Tolyl)piperazine hydrochloride, 97%

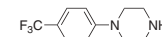
C₁₁H₁₆N₂ · HCl
FW 212.72
[70849-60-4]



T42005-5G	5 g	
T42005-25G	25 g	

1-(4-Trifluoromethylphenyl)piperazine, 98.0%

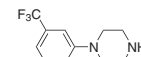
C₁₁H₁₃F₃N₂
FW 230.23
[30459-17-7]



80077-1G	1 g	
80077-5G	5 g	

1-(α,α,α-Trifluoro-m-tolyl)piperazine, 96%

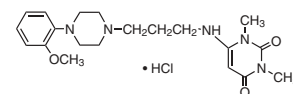
C₁₁H₁₃F₃N₂
FW 230.23
[15532-75-9]



T9073-5G	5 g	
T9073-25G	25 g	

Urapidil hydrochloride

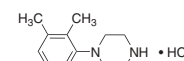
C₂₀H₂₉N₅O₃ · HCl
FW 423.94
[64887-14-5]



U100-100MG	100 mg	
U100-500MG	500 mg	


1-(2,3-Xylyl)piperazine monohydrochloride, 98%

C₁₂H₁₈N₂ · HCl
FW 226.75
[80836-96-0]




275182-25G	25 g	
275182-100G	100 g	


New Trifluoroborate Salts for Suzuki Coupling from Aldrich R&D**Potassium vinyltrifluoroborate, 95%**

65,522-8  1 g
5 g

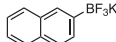
Potassium 2-methoxyphenyltrifluoroborate

65,493-0  1 g
5 g

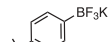
Potassium 5-methyl-2-thiophenyltrifluoroborate

65,494-9  1 g
5 g


Potassium 2-naphthalenyltrifluoroborate

65,701-8  1 g
5 g

Potassium 4-tert-butylphenyltrifluoroborate, 95%

65,472-8  1 g
10 g

Potassium 2,4-difluorophenyltrifluoroborate

65,699-2  1 g
5 g

Trifluoroborates are air-stable alternatives to boronic acids in palladium-catalyzed Suzuki–Miyaura cross-coupling reactions.^{1,2} They are more robust, easier to handle, and less prone to protodeboronation.¹ They display a remarkably uniform behavior.²

(1) Molander, G. A.; Biolatto, B. *J. Org. Chem.* **2003**, *68*, 4302. (2) Molander, G. A. et al. *J. Org. Chem.* **2003**, *68*, 5534.

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