

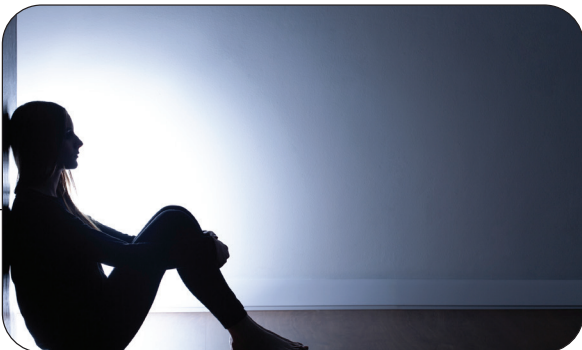
# Antidepressants

## BMF 83 - Antidepressants

Depression is a common psychiatric disorder impacting millions of people worldwide. It is caused by an imbalance of chemicals in the brain, namely serotonin and noradrenaline<sup>1</sup>. Everyone experiences highs and lows, but depression is characterised by persistent sadness for weeks or months<sup>2</sup>. With depression there is lasting feeling of hopelessness, often accompanied by anxiety. Sufferers lose interest in things that they previously enjoyed, and experience bouts of tearfulness. Rational thinking and decision making are impacted. Physical manifestations include tiredness, insomnia, loss of appetite and sex drive, aches and pains<sup>2</sup>. At its worst depression can cause the sufferer to feel suicidal.

Depression is usually treated with a combination of counselling and drug therapy. There is also evidence that exercise can help depression. Most people with moderate or severe depression benefit from antidepressant medication. There are a wide range of antidepressants on the market, which can be broadly divided according to mechanism of action<sup>3</sup>;

- **Selective serotonin reuptake inhibitors (SSRIs)**
- **Serotonin-norepinephrine reuptake inhibitors (SNRIs)**
- **Serotonin modulator and stimulators (SMSS)**
- **Serotonin antagonist and reuptake inhibitors (SARIs)**
- **Norepinephrine reuptake inhibitors (NRIs or NERIs)**
- **Tetracyclic antidepressants (TeCAs)**
- **Tricyclic antidepressants (TCAs)**
- **Monoamine oxidase inhibitors (MAOIs)**



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Today the most common first choice of medication is a SSRI<sup>1</sup>, i.e. Citalopram, Escitalopram, Fluvoxamine, Paroxetine, Sertraline, Fluoxetine.

Antidepressants are not addictive, but can result in withdrawal symptoms when therapy is stopped. These include stomach upset, flu-like symptoms, anxiety, dizziness, vivid dreams or electric shock sensations. In most cases symptoms are quite mild, and do not persist more than a week or two, but occasionally they can be quite severe. Onset occurs very soon after stopping, and so can be differentiated from depression relapse, which tends to occur later<sup>2</sup>.



Chiron offer a wide range of antidepressant reference materials and associated internal standards;

Catalogue No.	Description	Cas No.	Concentration	Solvent	Volume
	<b>Amitriptyline (Elavil)</b>				
2543.20-K-ME	Amitriptyline hydrochloride	549-18-8	1000 µg base/mL	methanol	1 mL
2543.20-10MG	Amitriptyline hydrochloride	549-18-8	neat	neat	10 mg
2543.20-100MG	Amitriptyline hydrochloride	549-18-8	neat	neat	100 mg
10343.20-100-ME	Amitriptyline- <i>d3</i> hydrochloride ( <i>N</i> -methyl- <i>d3</i> )	342611-00-1	100 µg base/mL	methanol	1 mL
10343.20-K-ME	Amitriptyline- <i>d3</i> hydrochloride ( <i>N</i> -methyl- <i>d3</i> )	342611-00-1	1000 µg base/mL	methanol	1 mL
10343.20-10MG	Amitriptyline- <i>d3</i> hydrochloride ( <i>N</i> -methyl- <i>d3</i> )	342611-00-1	neat	neat	10 mg
2544.15-100-ME	Amitriptyline Imp. A (Dibenzosuberone)	1210-35-1	100 µg/mL	methanol	1 mL
2544.15-100MG	Amitriptyline Imp. A (Dibenzosuberone)	1210-35-1	neat	neat	100 mg

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Catalogue No.	Description	Cas No.	Concentration	Solvent	Volume
2697.20-100-ME	Amitriptyline Imp. B (Cyclobenzaprine hydrochloride)	6202-23-9	100 µg base/mL	methanol	1 mL
2697.20-100MG	Amitriptyline Imp. B (Cyclobenzaprine hydrochloride)	6202-23-9	neat	neat	100 mg
2698.19-K-ME	Amitriptyline Imp. C (Nortriptyline hydrochloride)	894-71-3	1000 µg base/mL	methanol	1 mL
2698.19-10MG	Amitriptyline Imp. C (Nortriptyline hydrochloride)	894-71-3	neat	neat	10 mg
2698.19-100MG	Amitriptyline Imp. C (Nortriptyline hydrochloride)	894-71-3	neat	neat	100 mg
9193.19-100-ME	Nortriptyline- <i>d3</i> hydrochloride ( <i>N</i> -methyl- <i>d3</i> )	203784-52-5	100 µg base/mL	methanol	1 mL
9193.19-K-ME	Nortriptyline- <i>d3</i> hydrochloride ( <i>N</i> -methyl- <i>d3</i> )	203784-52-5	1000 µg base/mL	methanol	1 mL
9193.19-10MG	Nortriptyline- <i>d3</i> hydrochloride ( <i>N</i> -methyl- <i>d3</i> )	203784-52-5	neat	neat	10 mg
2711.20-100-ME	Amitriptyline Imp. D (5-(3-Dimethylaminopropyl)-10,11- dihydro-5H-dibenzo[ <i>a,d</i> ]cyclohepten-5- ol)	1159-03-1	100 µg/mL	methanol	1 mL
<b>Clomipramine (Anafranil)</b>					
9530.19-100-ME	Clomipramine hydrochloride	17321-77-6	100 µg base/mL	methanol	1 mL
9530.19-K-ME	Clomipramine hydrochloride	17321-77-6	1000 µg base/mL	methanol	1 mL
9530.19-10MG	Clomipramine hydrochloride	17321-77-6	neat	neat	10 mg
9530.19-25MG	Clomipramine hydrochloride	17321-77-6	neat	neat	25 mg
9530.19-50MG	Clomipramine hydrochloride	17321-77-6	neat	neat	50 mg
9530.19-100MG	Clomipramine hydrochloride	17321-77-6	neat	neat	100 mg
10356.19-100-ME	Clomipramine- <i>d6</i> hydrochloride ( <i>N,N</i> -dimethyl- <i>d6</i> )	1189882-28-7	100 µg base/mL	methanol	1 mL
10356.19-K-ME	Clomipramine- <i>d6</i> hydrochloride ( <i>N,N</i> -dimethyl- <i>d6</i> )	1189882-28-7	1000 µg base/mL	methanol	1 mL
10357.19-100-ME	Desmethylclomipramine hydrochloride (Norclomipramine HCl)	29854-14-6	100 µg base/mL	methanol	1 mL
10357.19-K-ME	Desmethylclomipramine hydrochloride (Norclomipramine HCl)	29854-14-6	1000 µg base/mL	methanol	1 mL
10357.19-10MG	Desmethylclomipramine hydrochloride (Norclomipramine HCl)	29854-14-6	neat	neat	10 mg
<b>Citalopram (Cipramil)</b>					
9397.20-100-ME	(±)-Citalopram hydrobromide	59729-32-7	100 µg/mL	methanol	1 mL
9397.20-K-ME	(±)-Citalopram hydrobromide	59729-32-7	1000 µg/mL	methanol	1 mL
9397.20-10MG	(±)-Citalopram hydrobromide	59729-32-7	neat	neat	10 mg

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Catalogue No.	Description	Cas No.	Concentration	Solvent	Volume
9398.20-100-ME	(±)-Citalopram- <i>d4</i> hydrobromide (4-fluorophenyl- <i>d4</i> )	1219803-58-3	100 µg/mL	methanol	1 mL
9398.20-K-ME	(±)-Citalopram- <i>d4</i> hydrobromide (4-fluorophenyl- <i>d4</i> )	1219803-58-3	1000 µg/mL	methanol	1 mL
9398.20-5MG	(±)-Citalopram- <i>d4</i> hydrobromide (4-fluorophenyl- <i>d4</i> )	1219803-58-3	neat	neat	5 mg
11330.19-K-ME	(±)-Desmethylcitalopram hydrochloride	97743-99-2	1000 µg base/mL	methanol	1 mL
11631.20-10MG	(S)-Citalopram oxalate (Escitalopram oxalate)	219861-08-2	neat	neat	10 mg
	<b>Desipramine</b>				
11411.18-K-ME	Desipramine hydrochloride (Imipramine HCl EP Imp A)	58-28-6	1000 µg base/mL	methanol	1 mL
	<b>Dosulepin (Dothiepin)</b>				
11413.19-K-ME	Dosulepin	897-15-4	1000 µg/mL	methanol	1 mL
	<b>Doxepin (Deptran)</b>				
9400.19-100-ME	Doxepin hydrochloride ( <i>cis+trans</i> )	1229-29-4 (as <i>trans</i> )	100 µg base/mL	methanol	1 mL
9400.19-K-ME	Doxepin hydrochloride ( <i>cis+trans</i> )	1229-29-4 (as <i>trans</i> )	1000 µg base/mL	methanol	1 mL
9400.19-10MG	Doxepin hydrochloride ( <i>cis+trans</i> )	1229-29-4 (as <i>trans</i> )	neat	neat	10 mg
9400.19-25MG	Doxepin hydrochloride ( <i>cis+trans</i> )	1229-29-4 (as <i>trans</i> )	neat	neat	25 mg
9399.19-100-ME	Doxepin- <i>d3</i> hydrochloride ( <i>N</i> -methyl- <i>d3</i> ) ( <i>cis+trans</i> )	347840-07-7 (as <i>trans</i> )	100 µg base/mL	methanol	1 mL
9399.19-K-ME	Doxepin- <i>d3</i> hydrochloride ( <i>N</i> -methyl- <i>d3</i> ) ( <i>cis+trans</i> )	347840-07-7 (as <i>trans</i> )	1000 µg base/mL	methanol	1 mL
9399.19-10MG	Doxepin- <i>d3</i> hydrochloride ( <i>N</i> -methyl- <i>d3</i> ) ( <i>cis+trans</i> )	347840-07-7 (as <i>trans</i> )	neat	neat	10 mg
10360.18-K-ME	Desmethyldoxepin hydrochloride (Nordoxepin HCl)	2887-91-4	1000 µg base/mL	methanol	1 mL
10360.18-10MG	Desmethyldoxepin hydrochloride (Nordoxepin HCl)	2887-91-4	neat	neat	10 mg
10360.18-25MG	Desmethyldoxepin hydrochloride (Nordoxepin HCl)	2887-91-4	neat	neat	25 mg
	<b>Duloxetine</b>				
10346.18-25MG	Duloxetine hydrochloride	136434-34-9	neat	neat	25 mg
10346.18-50MG	Duloxetine hydrochloride	136434-34-9	neat	neat	50 mg
10346.18-100MG	Duloxetine hydrochloride	136434-34-9	neat	neat	100 mg
	<b>Fluoxetine (Prozac)</b>				
9760.17-K-ME	Fluoxetine	54910-89-3	1000 µg/mL	methanol	1 mL
9760.17-10MG	Fluoxetine	54910-89-3	neat	neat	10 mg
9760.17-50MG	Fluoxetine	54910-89-3	neat	neat	50 mg
9760.17-100MG	Fluoxetine	54910-89-3	neat	neat	100 mg
9291.17-K-ME	Fluoxetine hydrochloride	56296-78-7	1000 µg base/mL	methanol	1 mL
9291.17-10MG	Fluoxetine hydrochloride	56296-78-7	neat	neat	10 mg
9292.17-100-ME	Fluoxetine- <i>d5</i> hydrochloride (phenyl- <i>d5</i> )	1173020-43-3	100 µg base/mL	methanol	1 mL

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Catalogue No.	Description	Cas No.	Concentration	Solvent	Volume
9292.17-10MG	Fluoxetine- <i>d5</i> hydrochloride (phenyl- <i>d5</i> )	1173020-43-3	neat	neat	10 mg
9402.16-100-ME	Norfluoxetine hydrochloride	57226-68-3	100 µg base/mL	methanol	1 mL
9402.16-10MG	Norfluoxetine hydrochloride	57226-68-3	neat	neat	10 mg
9403.16-100-ME	Norfluoxetine- <i>d5</i> (propyl-1,1,2,2,3- <i>d5</i> )	1185132-92-6	100 µg/mL	methanol	1 mL
9403.16-5MG	Norfluoxetine- <i>d5</i> (propyl-1,1,2,2,3- <i>d5</i> )	1185132-92-6	neat	neat	5 mg
	<b>Flupentixol</b>				
10358.23-K-ME	Flupentixol dihydrochloride ( <i>cis+trans</i> )	2413-38-9	1000 µg base/mL	methanol	1 mL
10358.23-10MG	Flupentixol dihydrochloride ( <i>cis+trans</i> )	2413-38-9	neat	neat	10 mg
10712.23-K-ME	<i>cis</i> -( <i>Z</i> )-Flupentixol dihydrochloride	51529-01-2	1000 µg base/mL	methanol	1 mL
10712.23-10MG	<i>cis</i> -( <i>Z</i> )-Flupentixol dihydrochloride	51529-01-2	neat	neat	10 mg
	<b>Fluvoxamine</b>				
10347.19-50MG	Fluvoxamine maleate	61718-82-9	neat	neat	50 mg
10347.19-100MG	Fluvoxamine maleate	61718-82-9	neat	neat	100 mg
	<b>Imipramine</b>				
10853.19-K-ME	Imipramine hydrochloride	113-52-0	1000 µg base/mL	methanol	1 mL
10853.19-10MG	Imipramine hydrochloride	113-52-0	neat	neat	10 mg
	<b>Mianserin</b>				
9413.18-K-ME	Mianserin hydrochloride	21535-47-7	1000 µg base/mL	methanol	1 mL
9413.18-10MG	Mianserin hydrochloride	21535-47-7	neat	neat	10 mg
9414.18-100-ME	Mianserin- <i>d3</i> hydrochloride (methyl- <i>d3</i> )	1219804-97-3	100 µg base/mL	methanol	1 mL
9414.18-5MG	Mianserin- <i>d3</i> hydrochloride (methyl- <i>d3</i> )	1219804-97-3	neat	neat	5 mg
10354.17-100-ME	Desmethylmianserin (Normianserin)	71936-92-0	100 µg/mL	methanol	1 mL
10354.17-10MG	Desmethylmianserin (Normianserin)	71936-92-0	neat	neat	10 mg
	<b>Mirtazapine (Zispin)</b>				
9288.17-100-ME	Mirtazapine	61337-67-5	100 µg/mL	methanol	1 mL
9288.17-K-ME	Mirtazapine	61337-67-5	1000 µg/mL	methanol	1 mL
9288.17-10MG	Mirtazapine	61337-67-5	neat	neat	10 mg
9288.17-25MG	Mirtazapine	61337-67-5	neat	neat	25 mg
9288.17-100MG	Mirtazapine	61337-67-5	neat	neat	100 mg
9455.17-100-ME	Mirtazapine- <i>d3</i> (methyl- <i>d3</i> )	1216678-68-0	100 µg/mL	methanol	1 mL
9455.17-1MG	Mirtazapine- <i>d3</i> (methyl- <i>d3</i> )	1216678-68-0	neat	neat	1 mg
11189.16-10MG	Desmethylmirtazapine hydrochloride (Normirtazapine HCl)	61337-68-6 (freebase)	neat	neat	10 mg



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Catalogue No.	Description	Cas No.	Concentration	Solvent	Volume
	<b>Moclobemide</b>				
10732.13-10MG	Moclobemide	71320-77-9	neat	neat	10 mg
	<b>Opipramol</b>				
11641.23-100-AN	Opipramol	315-72-0	100 µg/mL	methanol	1 mL
	<b>Paroxetine (Seroxat)</b>				
9529.19-K-ME	(-)-(3S,4R)-Paroxetine hydrochloride hemihydrate	110429-35-1	1000 µg base/mL	methanol	1 mL
9529.19-10MG	(-)-(3S,4R)-Paroxetine hydrochloride hemihydrate	110429-35-1	neat	neat	10 mg
10367.19-100-ME	(-)-(3S,4R)-Paroxetine-d6 maleate (methylene-d2, alpha-N-piperazine-d4)	1435728-64-5	1000 µg/mL	methanol	1 mL
10367.19-5MG	(-)-(3S,4R)-Paroxetine-d6 maleate (methylene-d2, alpha-N-piperazine-d4)	1435728-64-5	neat	neat	5 mg
	<b>Phenibut (Fenibut, Phenybut)</b>				
11395.10-10MG	Phenibut hydrochloride	3060-41-1	neat	neat	10 mg
	<b>Sertraline (Zoloft)</b>				
9284.17-100-ME	(+)-(1S,4S)-Sertraline hydrochloride	79559-97-0	100 µg base/mL	methanol	1 mL
9284.17-K-ME	(+)-(1S,4S)-Sertraline hydrochloride	79559-97-0	1000 µg base/mL	methanol	1 mL
9284.17-10MG	(+)-(1S,4S)-Sertraline hydrochloride	79559-97-0	neat	neat	10 mg
9284.17-25MG	(+)-(1S,4S)-Sertraline hydrochloride	79559-97-0	neat	neat	25 mg
9284.17-100MG	(+)-(1S,4S)-Sertraline hydrochloride	79559-97-0	neat	neat	100 mg
10601.17-100-ME	(±)-cis-Sertraline-d3 hydrochloride (N-methyl-d3)	1217741-83-7	100 µg base/mL	methanol	1 mL
10602.17-100-ME	(±)-cis-Sertraline-d3 hydrochloride (N-methyl-d3)	1330180-66-9	100 µg base/mL	methanol	1 mL
	<b>Tianeptine</b>				
11500.21-K-ME	Tianeptine sulphate mono hydrate (anhydrous)	30123-17-2	1000 µg base/mL	methanol	1 mL
11500.21-10MG	Tianeptine sulphate mono hydrate (anhydrous)	30123-17-2	neat	neat	10 mg
	<b>Trazodone (Molipaxin)</b>				
10862.19-K-ME	Trazodone hydrochloride	25332-39-2	1000 µg base/mL	methanol	1 mL
10862.19-10MG	Trazodone hydrochloride	25332-39-2	neat	neat	10 mg
	<b>Trimipramine (Surmontil)</b>				
9415.24-K-ME	Trimipramine maleate	521-78-8	1000 µg/mL	methanol	1 mL
9415.24-10MG	Trimipramine maleate	521-78-8	neat	neat	10 mg
9416.24-100-ME	Trimipramine-d3 maleate (N-methyl-d3)	136765-54-3 (free base)	100 µg/mL	methanol	1 mL
9416.24-10MG	Trimipramine-d3 maleate (N-methyl-d3)	136765-54-3 (free base)	neat	neat	10 mg
	<b>Venlafaxine (Effexor)</b>				
9417.17-K-ME	Venlafaxine hydrochloride	99300-78-4	1000 µg base/mL	methanol	1 mL
9417.17-10MG	Venlafaxine hydrochloride	99300-78-4	neat	neat	10 mg
9417.17-50MG	Venlafaxine hydrochloride	99300-78-4	neat	neat	50 mg

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Catalogue No.	Description	Cas No.	Concentration	Solvent	Volume
9417.17-100MG	Venlafaxine hydrochloride	99300-78-4	neat	neat	100 mg
9417.17-250MG	Venlafaxine hydrochloride	99300-78-4	neat	neat	250 mg
9418.17-100-ME	Venlafaxine- <i>d6</i> hydrochloride ( <i>N,N</i> -dimethyl- <i>d3</i> )	1062606-12-5	100 µg base/mL	methanol	1 mL
9418.17-K-ME	Venlafaxine- <i>d6</i> hydrochloride ( <i>N,N</i> -dimethyl- <i>d3</i> )	1062606-12-5	1000 µg base/mL	methanol	1 mL
9418.17-5MG	Venlafaxine- <i>d6</i> hydrochloride ( <i>N,N</i> -dimethyl- <i>d3</i> )	1062606-12-5	neat	neat	5 mg
10335.16-100-ME	<i>O</i> -Desmethylvenlafaxine	93413-62-8	100 µg/mL	methanol	1 mL
10335.16-10MG	<i>O</i> -Desmethylvenlafaxine	93413-62-8	neat	neat	10 mg

Catalogue No.	Description	Cas No.	Concentration
<b>Component part</b>	<b>Antidepressant Mix 1</b> 13 Analytes at assorted concentrations in methanol		
9530.19	Clomipramine hydrochloride	17321-77-6	500 µmol/L
10357.19	Norclomipramine hydrochloride	29854-14-6	500 µmol/L
2543.20	Amitriptyline hydrochloride	549-18-8	250 µmol/L
9413.18	Mianserin hydrochloride	21535-47-7	250 µmol/L
10354.17	Desmethylmianserin	71936-92-0	250 µmol/L
2698.19	Nortriptyline hydrochloride	894-71-3	250 µmol/L
9529.19	Paroxetine hydrochloride hemihydrate	110429-34-1	250 µmol/L
9397.20	Citalopram hydrobromide	59729-32-7	250 µmol/L
11330.19	Desmethylcitalopram hydrochloride	97743-99-2	250 µmol/L
9760.17	Fluoxetine	54910-89-3	500 µmol/L
9402.16	Norfluoxetine hydrochloride	57226-68-3	500 µmol/L
9417.16	Venlafaxine hydrochloride	99300-78-4	625 µmol/L
10335.16	<i>O</i> -Desmethylvenlafaxine	93413-62-8	625 µmol/L
S-4886-ASS-ME	1 x 1 mL ampoule		
S-4886-ASS-MEx5	5 x 1mL ampoules		



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Please contact us for information on ACQ Science antidepressant accuracy controls in serum.

### References:

[1] A. W. Jones, *Perspectives in Drug Discovery: A collection of Essays on the History and Development of Pharmaceutical Substances*. National Board of Forensic Medicine. RMV Report – 2010:1.

[3] NHS Choices Your health, your choices, Clinical depression <http://www.nhs.uk/Conditions/Depression/Pages/Introduction.aspx> (accessed August 16).

[2] Wikipedia – Key search terms ‘antidepressants’ ‘depression’ ‘SSRI’ (accessed August 2016).



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