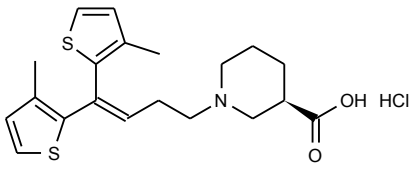
BDG SYNTHESIS

Certificate of Analysis

BDG Synthesis certifies that this reference material meets or exceeds the specifications stated herein.

Barry Dent

Barry R. Dent, PhD, Director
17 April 2012

Name:	**Tiagabine HCl**
CAS Number:	145821-59-6
Structure:	
Molecular Weight:	$C_{20}H_{25}NO_2S_2 \cdot HCl = 412.01$
Lot Number:	BDG 10686.3
Appearance:	Off-white, crystalline powder
Purity By HPLC:	99.6 %
Re-test Date:	17 April 2017
Storage and Handling:	Temperature: refrigerate for prolonged storage; may be handled and shipped at ambient temperature.
	Humidity: not believed to be hygroscopic; may be handled in normal laboratory atmosphere.
	Light: protect from strong sunlight.
	Caution: only experienced laboratory personnel should handle the material.

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Identity and Purity

Proton NMR Spectrum

Identity: the signals are consistent with the proposed structure and in accord with literature where available.
Residual Solvents: no residual solvents are observed.
Impurities: no significant impurities are evident in the spectrum.

Carbon-13 NMR Spectrum

Identity: the signals are consistent with the proposed structure and in accord with literature where available. Some signals are broadened as a result of heteroatom attachment or restricted rotation affecting nuclear-spin relaxation.

High-resolution Mass Spectrum (ESI+)

Found *m/z* 376.1393. $C_{20}H_{26}NO_2S_2$ $[M+H]^+$ (free base) requires *m/z* 376.1399. The deviation of 1.6 ppm is within normally accepted limits for the establishment of identity by HRMS.

HPLC

A sharp, symmetrical peak is observed (99.6 %). Note: in the absence of reference materials for preparing calibration curves, it is assumed that all peaks have the same detector response. Where possible, the conditions of analysis follow a pharmacopeial or literature method, or have been adapted from same.

Elemental Analysis

	Found:	C 58.46, H 6.39, N 3.36 %
$C_{20}H_{25}NO_2S_2 \cdot HCl$	Requires:	C 58.30, H 6.36, N 3.40 %

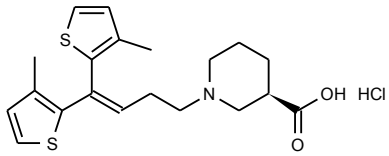
The elemental analyses fall within generally accepted limits for establishing the molecular formula given. The results may also be taken to imply the absence of significant quantities of water or inorganic salts (which have not been elsewhere tested for because of sample size limitations).

The available quantity of custom-synthesised material is always small, and this limits the extent and type of analytical data which can be obtained. This Certificate is presented in descriptive format for use by analytical chemists who are trained in the use of custom-synthesised materials. Custom materials often contain higher levels of residual solvents and/or water, and we urge you to use the corrected purity where needed rather than the raw HPLC purity. This compound is intended for use as an analytical reference material and it is not for human administration. Structures are shown with relative stereochemistry unless otherwise specified.

The re-test date is assigned from experience gained with the material in the laboratory and/or on storage. It is not possible to perform formal storage studies because of the small amount of material available.

BDG SYNTHESIS

Proton NMR Spectrum of Tiagabine HCl in DMSO-d_6



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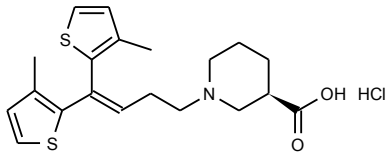
BDG SYNTHESIS

Carbon-13 NMR Spectrum of Tiagabine HCl in DMSO-d_6



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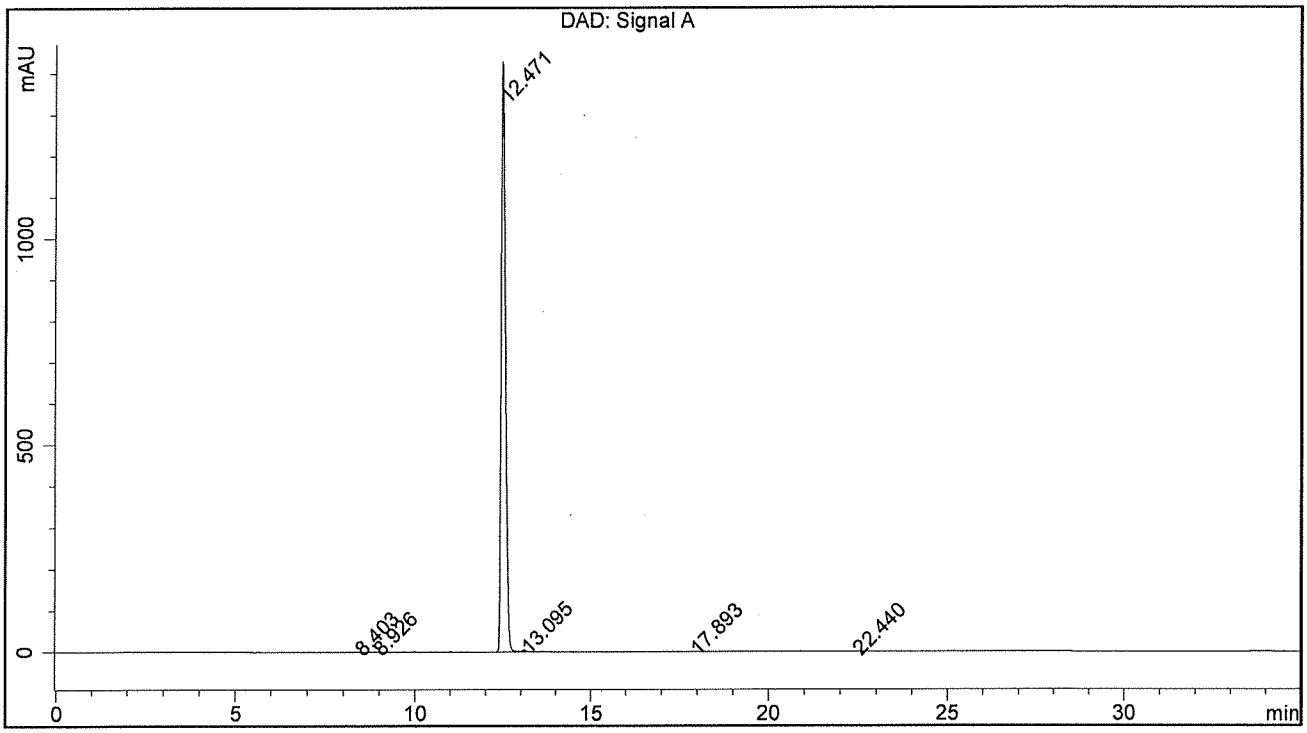
BDG - Analysis of Tiagabine Hydrochloride

Column : Phenomenex Luna C18(2) 5um 250 x 4.6 mm
Guard : Phenomenex Security Guard C18 RP 4 x 3 mm
Mobile Phase A : 25 mM Potassium diHydrogen Phosphate + 10 mM Sodium Heptanesulphonate pH=3.0 (H3PO4)
Mobile Phase B : Acetonitrile
Gradient (A:B) : T0=70:30; T20=30:70, T25=30:70, T30=70:30, T35=70:30
Flow Rate : 1.0 mL/min
Sample Solvent : Mobile Phase
Column Temperature : 20C
Injection Volume : 10 uL
Detection : UV at 270 nm

Sample Name	BDG 10686.3	**Instrument**	AnalyticalLC01
Acquisition	17/04/2012, 21:39:41	**Method (rev.)**	LC10273a (3)
Sequence	BDG_17Apr2012a	**Vial Position**	1
Operator	solvation010\cerityadmin	**Injection**	2 of 2



Area Percent Report

Peak#	RT	Peak Height	Peak Area	Width	Area %
1	8.40 min	0.4653	2.8669	0.0919 min	0.024 %
2	8.93 min	0.3092	2.1399	0.0987 min	0.018 %
3	12.47 min	1427.7466	11720.6971	0.1258 min	99.610 %
4	13.10 min	3.7785	31.1014	0.1220 min	0.264 %
5	17.89 min	0.4592	5.2704	0.1579 min	0.045 %
6	22.44 min	0.4553	4.5419	0.1504 min	0.039 %