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Do you need novel biologicals?

We hold the key

Introducing Targeted Venom Discovery Arrays (T-VDA™)

Unique venom libraries for YOUR drug discovery programs

CONTENTS

Unlock millions of years of evolution...

The **Targeted Venom Discovery Array (T-VDA™)** is specifically designed to maximize discovery of new drug leads and tools. Venom peptides blocking ion channels and GPCRs in disease areas such as pain, antibiotics and cardiovascular disease are the next generation of therapeutics. Venoms from theraphosids (tarantulas), scorpions and snakes are rich sources of new drug discovery tools. These targeted arrays contain pure venom fractions from 12, 24, 48 or 96 species **optimised for identification of novel tools**. Each array contains characterized venoms active in specific pathways from the literature to act as positive controls. The other venom fractions making up the library have been specially selected by our drug discovery scientists to maximize novel hit potential.

We hold the key

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Target:	Acid Sensing Ion Channels
Format:	Targeted Venom Discovery Array
Code:	T-VDA^{ASIC}

Product Description

The **ASIC (Acid Sensing Ion Channel) Targeted Venom Discovery Array™ (T-VDA^{ASIC})** is specifically designed to maximise discovery of new tools. ASIC channels are important drug targets for **neurological disorders**, specifically **pain.** ASIC channel tools from theraphosids (tarantulas) and snakes are the most potent and selective agents currently known. These targeted arrays contain pure venom fractions from 12, 24, 48or 96 species **optimised for identification of novel tools**. Each array contains characterised venoms active at ASIC channels from the literature to act as positive controls. The control venoms for T-VDA^{ASIC} include *Psalmopoeus cambridgei* (Trinidad chevron tarantula) which contains **Psalmotoxin**, a selective blocker of ASIC1a channels[1]; *Dendroaspis polylepis* (Black mamba) venom which contains **Mambalgins** that block ASIC1a/2a heteromers[2]; and *Dendroaspis angusticeps* (Eastern green mamba) venom which contains mambalgin-3 that blocks ASIC1a and ASIC1b channels as well as 1a/2b heteromers[3]. Other venom fractions making up the library have been specially selected by our drug discovery scientists to maximise novel hit potential.

- Venoms are supplied lyophilised in Echo® qualified acoustic source plates (Labcyte Inc) and are useable on any SBS footprint liquid handling device or by hand.
- 384-well format has 200ng venom fraction per well, suggested dilution 20µl as hit fractions are typically active at 5µg/ml and below.
- 1536-well format also available.

1. Escoubas P., de Weille J.R., Lecoq A., Diochot S., Waldmann R., Champigny G., Moinier D., Menez A., Lazdunski M.(2000).Isolation of a tarantula toxin specific for a class of proton-gated Na+ channels.J. Biol. Chem. 275:25116-25121
2. Diochot S., Baron A., Salinas M., Douguet D., Scarzello S., Dabert-Gay A.-S., Debayle D., Friend V., Alloui A., Lazdunski M., Lingueglia E.(2012). Black mamba venom peptides target acid-sensing ion channels to abolish pain.Nature 490:552-555
3. Schweitz H., Diochot S., Baron A., Salinas M., Lingueglia E.(2013). Venom toxins in the exploration of molecular, physiological and pathophysiological functions of acid-sensing ion channels.Submitted (FEB-2013) to UniProtKB C0HJB0

Data compiled from UniProt: Reorganizing the protein space at the Universal Protein Resource (UniProt), Nucleic Acids Res. 40: D71-D75 (2012).

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Target:	Calcium Channels
Format:	Targeted Venom Discovery Array
Code:	T-VDA^{Ca2+}

Product Description

The **calcium (Ca2+) channel Targeted Venom Discovery Array™ (T-VDA^{Ca2+})** is specifically designed to maximise discovery of new tools. Ca^{2+}channels are important drug targets for a range of **neurological disorders**, specifically **pain.** Venoms from theraphosids (tarantulas), scorpions and snakes are rich sources of new Ca channel tools. These targeted arrays contain pure venom fractions from 12,24, 48 or 96 species **optimised for identification of novel tools**. Each array contains characterised venoms active on calcium channels from the literature to act as positive controls. The control venoms for T-VDA^{Ca2+}include *Parabuthus transvaalicus* (SouthAfrican fattail scorpion) which contains **Kurtoxin** with broad spectrum calcium channel activity L,T,N and P type channels[1]; *Dendroaspis angusticeps* (Eastern green mamba) venom which contains **Calcicludin**,a potent L-type calcium channel blocker[2]; and *Hysterocrates gigas* (Cameroon red baboon tarantula) venom which blocks N and E type calcium currents[3]. Other venom fractions making up the library have been specially selected by our drug discovery scientists to maximise novel hit potential.

- Venoms are supplied lyophilised in Echo® qualified acoustic source plates (Labcyte Inc) and are useable on any SBS footprint liquid handling device or by hand.
- 384-well format has 200ng venom fraction per well, suggested dilution 20µl as hit fractions are typically active at 5µg/ml and below.
- 1536-well format also available.

1. Chuang R.S.-I., Jaffe H., Cribbs L., Perez-Reyes E., Swartz K(1998).Inhibition of T-type voltage-gated calcium channels by a new scorpion toxin. J.Nat. Neurosci. 1:668-6742.
2. Schweitz H., Heurteaux C., Bois P., Moinier D., Romey G., Lazdunski M.(1994).Calcicludine, a venom peptide of the Kunitz-type protease inhibitor family, is a potent blocker of high-threshold Ca2+ channels with a high affinity for L-type channels in cerebellar granule neurons. Proc. Natl. Acad. Sci. U.S.A. 91:878-8823.
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Target:	Potassium Channels
Format:	Targeted Venom Discovery Array
Code:	T-VDA^{K+}

Product Description

The potassium (K^+) channel Targeted Venom Discovery Array™ is specifically designed to maximise discovery of new tools. K^+ channels are important drug targets for a range of **neurological disorders** including **pain.** Venoms from scorpions, snakes and spiders are rich sources of new K^+ tools. These targeted arrays contain pure venom fractions from 12, 24, 48 or 96 species optimised for identification of novel tools. Each array contains characterised venoms active on potassium channels from the literature to act as positive controls. The control venoms for T-VDA^{K+} include *Dendroaspis polylepis* (black mamba snake) where **Dendrotoxin K**[1]was discovered; *Pandinus imperator* (emperor scorpion) where several **selective potassium channel tools** have been discovered[2]; and *Grammostola rosea* (Chilean rose tarantula) which also contains a diverse **collection of toxins including gating modifiers**[3]. The other venom fractions making up the library have been specially selected by our drug discovery scientists to maximise novel hit potential

- Venoms are supplied lyophilised in Echo® qualified acoustic source plates (Labcyte Inc) and are useable on any SBS footprint liquid handling device or by hand.
- 384-well format has 200ng venom fraction per well, suggested dilution 20µl as hit fractions are typically active at 5µg/ml and below.
- 1536-well format also available.

1. Smith L.A., Lafaye P.J., LaPenotiere H.F., Spain T., Dolly J.O.(1993). Cloning and functional expression of dendrotoxin K from black mamba, a K+ channel blocker.Biochemistry 32:5692-5697
2. Rogowski R.S., Collins J.H., O'Neill T.J., Gustafson T.A., Werkman T.R., Rogawski M.A., Tenenholz T.C., Weber D.J., Blaustein M.P. (1996). Three new toxins from the scorpion Pandinus imperator selectively block certain voltage-gated K+ channels. Mol. Pharmacol. 50:1167-1177
3. Swartz K.J., MacKinnon R.(1995). An inhibitor of the Kv2.1 potassium channel isolated from the venom of a Chilean tarantula. Neuron 15:941-949

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Target:	Sodium Channels
Format:	Targeted Venom Discovery Array
Code:	T-VDA^{Na+}

Product Description

The **sodium (Na^+) channel Targeted Venom Discovery Array™ (T-VDA^{Na+})** is specifically designed to maximise discovery of new tools. Na+channels are important drug targets for a range of **neurological disorders,** specifically **pain.** Venoms from theraphosids (tarantulas), scorpions and snakes are rich sources of new Na^+ tools. These targeted arrays contain pure venom fractions from 12, 24, 48 or 96 species **optimised for identification of novel tools**. Each array contains characterised venoms active on sodium channels from the literature to act as positive controls. The control venoms for T-VDA^{Na+} include *Thrixopelma puriens* (Peruvian velvet tarantula) where **Protox II**, a gating modifier of NaV1.7[1], was discovered*; Androctonus australis* (Sahara scorpion) where several selective sodium channel tools have been discovered[2]; and Crotalus *durissus* (South American rattlesnake) venom which contains **crotamine**[3], one of the very few snake-derived Na^+channel toxins. The other venom fractions making up the library have been specially selected by our drug discovery scientists to maximise novel hit potential.

- Venoms are supplied lyophilised in Echo® qualified acoustic source plates (Labcyte Inc) and are useable on any SBS footprint liquid handling device or by hand.
- 384-well format has 200ng venom fraction per well, suggested dilution 20µl as hit fractions are typically active at 5µg/ml and below.
- 1536-well format also available.

1. Priest B.T., Blumenthal K.M., Smith J.J., Warren V.A., Smith M.M.(2007). ProTx-I and ProTx-II: gating modifiers of voltage-gated sodium channels. Toxicon, 49:194-201
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Data compiled from UniProt: Reorganizing the protein space at the Universal Protein Resource (UniProt), Nucleic Acids Res. 40: D71-D75 (2012).

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Target:	**Pain –analgesics and antinociceptives**
Format:	**Targeted Venom Discovery Array**
Code	T-VDA^{pain}

Product Description

The **Pain Targeted Venom Discovery Array (T-VDA)** is specifically designed to maximise discovery of new analgesic tools. Ion channels are very important pain targets along with receptors such as opioids and acetylcholine. Venoms from theraphosids (tarantulas), scorpions and snakes are rich sources of new analgesic tools. These targeted arrays contain pure venom fractions from 12, 24,48 or 96 species **optimised for identification of novel tools**. Each array contains characterised venoms active in analgesic pathways from the literature to act as positive controls. The control venoms for T-VDA^{pain} include *Thrixopelma puriens*(Peruvian velvet tarantula) where **Protox II**, a gating modifier of NaV1.7[1], was discovered; *Leiurus quinquestriatus* (death stalker scorpion) where **opioid selective tools** have been discovered[2]; and *Dendroaspis polylepis* (black mamba) venom which contain **mambalgins**[3]-potent and selective ASIC channel tools. The other venom fractions making up the library have been specially selected by our drug discovery scientists to maximise novel hit potential.

- Venoms are supplied lyophilised in Echo® qualified acoustic source plates (Labcyte Inc) and are useable on any SBS footprint liquid handling device or by hand.
- 384-well format has 200ng venom fraction per well, suggested dilution 20µl as hit fractions are typically active at 5µg/ml and below.
- 1536-well format also available.

1. Priest B.T., et al. (2007). ProTx-I and ProTx-II: gating modifiers of voltage-gated sodium channels. Toxicon49:194-201
2. Martin-Eauclaire MFet al(2010). Involvement of endogenous opioid system in scorpion toxin-induced antinociception in mice. Neurosci Lett.Sep 20;482(1):45-50
3. Diochot, S. et al. (2012). Black mamba venom peptides target acid-sensing ion channels to abolish pain. Nature 490, 552-555

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Target:	Anticoagulant
Format:	Targeted Venom Discovery Array
Code:	T-VDA^{acog}

Product Description

The Anticoagulant Targeted Venom Discovery ArrayTMis specifically designed to maximise discovery of new tools. Anticoagulants are important drug tools for a range of cardiovascular disordersincluding heart attack and stroke. Alongside leeches, venoms from snakes and jelly fish are also rich sources of new anticoagulants. Our targeted arrays contain pure venom fractions from 12, 24, 48 or 96 species optimised for identification of novel tools. Every array contains characterised venoms with anticoagulant activity from the literature to act as positive controls. The control venoms for T-VDAacoginclude Naja kaouthia(monocled cobra) which contains fibrinogenolytic toxins1; Aurelia aurita(moon jellyfish) where the fibrinogenolytic activity can completely liquefy clots2; and Hirudo verbana(medicinal leech) which famously also contains a diverse collection ofanticoagulants3. The other venom fractions making up thelibrary have been specially selected by our drug discovery scientists to maximise novel hit potential.

- Venoms are supplied lyophilised in Echo® qualified acoustic source plates (Labcyte Inc) and are useable on any SBS footprint liquid handling device or by hand.
- 384-well format has 200ng venom fraction per well, suggested dilution 20µl as hit fractions are typically active at 5µg/ml and below.
- 1536-well format also available.

1. Sekhar, C. C. & Chakrabarty, D. (2011). Fibrinogenolytic toxin from Indian monocled cobra (Naja kaouthia) venom. Journal of Biosciences36,355–361.
2. Rastogi, A., Biswas, S., Sarkar, A. & Chakrabarty, D. (2012). Anticoagulant activity of moon jellyfish (Aurelia aurita) tentacle extract. Toxicon60,719–723.
3. Kvist, S., Min. G.S. Siddall, M.E. (2013). Diversity and selective pressures of anticoagulants in three medicinal leeches (Hirudinida: Hirudinidae, Macrobdellidae). Ecology and Evolution3,918

Data compiled from UniProt: Reorganizing the protein space at the Universal Protein Resource (UniProt), Nucleic Acids Res. 40: D71-D75 (2012).

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Target:	Cytotoxins
Format:	Targeted Venom Discovery Array
Code:	T-VDA^{ctox}

Product Description

The **Cytotoxic Targeted Venom Discovery Array™**is specifically designed to maximise discovery of new tools. Cytotoxins are important drug tools for a range of applications including **oncology** and cellular mechanisms. Venoms from snakes (vipers and elapids) as well as scorpions are rich sources of new cytotoxins with various mechanisms. These targeted arrays contain pure venom fractions from 12, 24, 48 or 96 species optimised for identification of novel tools. Every array contains characterised venoms with cytotoxic activity from the literature to act as positive controls. The control venoms for T-VDA^{ctox} include *Naja nigricollis* (black-necked spitting cobra) which contains **three finger toxins**[1]; *Crotalus ruber* (red diamondback rattlesnake) where the cytotoxic activity is from multiple enzymatic mechanisms[2]; and *Scorpio maurus* (Israeli gold scorpion) which also contains a diverse collection of cytotoxic peptides[3]. The other venom fractions making up the library have been specially selected by our drug discovery scientists to maximise novel hit potential.

- Venoms are supplied lyophilised in Echo® qualified acoustic source plates (Labcyte Inc) and are useable on any SBS footprint liquid handling device or by hand.
- 384-well format has 200ng venom fraction per well, suggested dilution 20µl as hit fractions are typically active at 5µg/ml and below.
- 1536-well format also available.

1. Kalam, Y., Isbister, & G. K., Mirtschin, P.,Hodgson, W.C., & Konstantakopoulos, N.(2010).Validation of a cell-based assay to differentiate between the cytotoxic effects of elapid snake venoms. Journal of Pharmacological and Toxicological Methods1–6.
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3. Abdel-Rahman, M. A., Omran, M. A. A., & Abdel-Nabi, I. M.(2010).Neurotoxic and cytotoxic effects of venom from different populations of the Egyptian Scorpio maurus palmatus. Toxicon55,298–306

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Target:	Cardiovascular –coagulation, blood pressure, haemorrhage
Format:	Targeted Venom Discovery Array
Code:	T-VDA^{CV}

Product Description

Venoms are a proven therapeutic resource with several drugs on the market in cardiovascular biology such as anticoagulants and **antihypertensives**. Snake venoms are a rich source of new cardiovascular tools such as C-type lectins, serine proteases, **natriuretics** and a wealth of signalling peptides. These targeted arrays contain pure venom fractions from 12, 24, 48 or 96 species **optimised for identification of novel tools**. Each array contains characterised venoms active in analgesic pathways from the literature to act as positive controls. The control venoms for T-VDA^{CV} include *Crotalus adamanteus (*eastern diamondback rattlesnake) where several **bradykinin potentiating peptides** have been discovered[1]; *Dendroaspis angusticeps* (eastern green mamba) where several **novel natriuretic peptides** have been discovered[2]; *and Bitis gabonica* (Gaboon viper) venom which contains a large abundance of serine proteases and, in particular, rhinocerase[3]. Other venom fractions making up the library have been specially selected by our drug discovery scientists to maximise novel hit potential.

- Venoms are supplied lyophilised in Echo® qualified acoustic source plates (Labcyte Inc) and are useable on any SBS footprint liquid handling device or by hand.
- 384-well format has 200ng venom fraction per well, suggested dilution 20µl as hit fractions are typically active at 5µg/ml and below.
- 1536-well format also available.

1. Wermelinger L.S., Dutra D.L., Oliveira-Carvalho A.L., Soares M.R., Bloch C. Jr., Zingali R.B.(2005). Fast analysis of low molecular mass compounds present in snake venom: identification of ten new pyroglutamate-containing peptides.Rapid Commun. Mass Spectrom. 19:1703-1708
2. Vink S, Jin A.H., Poth K.J., Head G.A., Alewood P.F., (2012). Natriuretic peptide drug leads from snake venom. Toxicon. Mar 15;59(4).
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Data compiled from UniProt: Reorganizing the protein space at the Universal Protein Resource (UniProt), Nucleic Acids Res. 40: D71-D75 (2012).

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Target:	**Insecticides**
Format:	**Targeted Venom Discovery Array**
Code	T-VDA^{insect}

Product Description

The insecticide Targeted Venom Discovery Array™ (T-VDA^{insect}) is specifically designed to maximise discovery of new insecticide tools. Venoms are a rich source of insect-specific toxins as many arthropods have evolved these toxins for efficient prey capture. Insect-specific toxins from theraphosids (tarantulas) andscorpions are the most likely to yield the most useful materials. These targeted arrays contain pure venom fractions from 12, 24, 48 or 96 species **optimised for identification of novel tools**. Each array contains characterised venoms active at insect targets from the literature to act as positive controls. The control venoms for T-VDA Insect include *Leiurus quinquestriatus* (death stalker scorpion) which contains several insect-specific toxins –excitatory and inhibitory[1]; *Brachypelma smithi* (Mexican red-kneed tarantula) venom that contains insect-specific sodium channel toxins with no mammalian activity[2]; and *Phoneutria nigriventer* (Brazilian armed spider) venom which contains another insect-specific neurotoxin[3]. The other venom fractions making up the library have been specially selected by our drug discovery scientists to maximise novel hit potential.

- Venoms are supplied lyophilised in Echo qualified acoustic source plates (Labcyte Inc) and are useable on any SBS footprint liquid handling device or by hand.
- 384-well format has 200ng venom fraction per well, suggested dilution20µl as hit fractions are typically active at 5µg/ml and below.
- 1536-well format also available.

1. Kopeyan C., Mansuelle P., Sampieri F., Brando T., Bahraoui E.M., Rochat H., Granier C.(1990). Primary structure of scorpion anti-insect toxins isolated from the venom of Leiurus quinquestriatus quinquestriatus.FEBS Lett. 261:423-4262.
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Target: Antimicrobial –bacteria, fungi and parasites

Format: Targeted Venom Discovery Array

Code: T-VDA^{Microbe}

Product Description

With antibiotic resistance a significant global threat, venoms are proving a rich source of new molecules. The antimicrobial Targeted Venom Discovery Array (T-VDA™) is specifically designed to maximise discovery of new tools. **Novel antimicrobial peptides and proteins** have been found in venoms from snakes, spiders and scorpions. These targeted arrays contain pure venom fractions from 12, 24, 48 or 96 species optimised for identification of novel antimicrobials. Each array contains characterised venoms **active on microbial growth and survival** from the literature to act as positive controls. The control venoms for T-VDA^{microbe} include *Naja kaouthia* (monocled cobra) as well as many other snake venom proteins such as **phospholipase A2**and **L amino acid oxidase**, which have been shown to be bacteriocidal[1]; *Pandinus imperator* (emperor scorpion) where several antimicrobial peptides have been discovered[2]; and *Psalmopoeus Cambridgei* (Trinidad chevron tarantula) **where antiplasmodial ICK peptides** have been discovered[3]. The other venom fractions making up the library have been specially selected by our drug discovery scientists to maximise the novel hit potential.

- Venoms are supplied lyophilised in Echo® qualified acoustic source plates (Labcyte Inc) and are useable on any SBS footprint liquid handling device or by hand.
- 384-well format has 200ng venom fraction per well, suggested dilution 20µl as hit fractions are typically active at 5µg/ml and below.
- 1536-well format also available.

1. Samy RP, Stiles BG, Gopalakrishnakone P, Chow VT. (2011). Antimicrobial proteins from snake venoms: direct bacterial damage and activation of innate immunity against Staphylococcus aureusskin infection. Curr. Med. Chem. 18(33):5104-13
2. Zeng XC, Zhou L, Shi W, Luo X, Zhang L, Nie Y, Wang J, Wu S, Cao B, Cao H. (2013).Three new antimicrobialpeptides from the scorpion Pandinus imperator. Peptides. 45C:28-34
3. Choi S.-J., Parent R., Guillaume C., Deregnaucourt C., Delarbre C., Ojcius D.M., Montagne J.-J., Celerier M.-L., Phelipot A., Amiche M., Molgo J., Camadro J.-M., Guette C.(2004). Isolation and characterization of Psalmopeotoxin I and II: two novel antimalarial peptides from the venom of the tarantula Psalmopoeus cambridgei. FEBS Lett. 572:109-117

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Target:	Oncology
Format:	Targeted Venom Discovery Array
Code:	T-VDA^{oncol}

Product Description

Venoms are a proven therapeutic resource with several drugs in development for cancer therapeutics such as **antimetastics** and **tumour cell apoptosis**. Snake venoms are rich source of new oncology tools including disintegrins, L-amino-acid oxidase and a wealth of signalling peptides. These targeted arrays contain pure venom fractions from 12, 24, 48 or 96 species **optimised for identification of novel tools.** Each array contains characterised venoms active in analgesic pathways from the literature to act as positive controls. The control venoms for T-VDA^{Oncol} include *Agkistrodon contortrix*(Southern copperhead) where the disintegrin **Contortrostatin** was discovered[1]; *Deinagkistrodon acutus*(hundred pace pit viper) which contains an L-amino_acid oxidase enzyme that induces apoptosis in HeLa cancer cells[2]; and *Leiurus quinquestriatus* (death stalker scorpion) venom which contains small neurotoxic peptides that block chloride channels and can label gliomas[3]. The other venom fractions making up the library have been specially selected by our drug discovery scientists to maximise novel hit potential.

- Venoms are supplied lyophilised in Echo® qualified acoustic source plates (Labcyte Inc) and are useable on any SBS footprint liquid handling device or by hand.
- 384-well format has 200ng venom fraction per well, suggested dilution 20µl as hit fractions are typically active at 5µg/ml and below.
- 1536-well format also available

1. Zhou Q., Hu P., Ritter M.R., Swenson S.D., Argounova S., Epstein A.L., Markland F.S.Arch. (2000). Molecular cloning and functional expression of contortrostatin, a homodimeric disintegrin from southern copperhead snake venom. Biochem. Biophys. 375:278-288
2. Zhang L.& Wei L.J.(2007) ACTX-8, a cytotoxic L-amino acid oxidase isolated from Agkistrodon acutus snake venom, induces apoptosis in Hela cervical cancer cells.Life Sci. 80:1189-1197
3. Soroceanu L., Gillespie Y., Khazaeli M.B., Sontheimer H.(1998). Use of chlorotoxin for targeting of primary brain tumors.Cancer Res. 58:4871-4879

Data compiled from UniProt: Reorganizing the protein space at the Universal Protein Resource (UniProt), Nucleic Acids Res. 40: D71-D75 (2012).

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TOXIVEN BIOTECH PRIVATE LIMITED

Target:	Enzymes and Inhibitors
Format:	Targeted Venom Discovery Array
Code:	T-VDAEnz

Product Description

Enzymes are incredibly useful tools in a wide range of disciplines and industrial processes. Snake venoms are a rich source of enzymes such as phospholipases (PLA2), snake venom metalloproteinase (SVMP), phosphodiesterases, L-amino-acid oxidase (LAO) and many more. Moreover, invertebrate venoms also often contain enzymes such as phospholipase. Along with useful enzymes, venoms contain many **enzyme inhibitors** of pharmaceutical utility. These targeted arrays contain pure venom fractions from 12, 24, 48 or 96 species **optimised for identification of novel tools**. Each array contains characterised venoms **active in analgesic pathways** from the literature to act as positive controls. The control venoms for T-VDA^{Enz} include phospholipase A2-containing *Naja nigricollisvenom* (black-necked spitting cobra)[1]; *Deinagkistrodon acutus*(hundred pace pit viper) which contains an **L-amino-acid oxidase enzymethat induces apoptosis in HeLa cancer cells**[2]; and *Crotalus adamanteus* (Eastern diamondback rattlesnake) venom which contains **snake venom metalloproteinases** such as Adamalysin[3]. Other venom fractions making up the library have been specially selected by our drug discovery scientists to maximise novel hit potential.

- Venoms are supplied lyophilised in Echo® qualified acoustic source plates (Labcyte Inc) and are useable on any SBS footprint liquid handling device or by hand.
- 384-well format has 200ng venom fraction per well, suggested dilution 20µl as hit fractions are typically active at 5µg/ml and below.
- 1536-well format also available.

1. Stefansson S., Kini R.M., Evans H.J.(1990). The basic phospholipase A2 from Naja nigricollis venom inhibits the prothrombinase complex by a novel nonenzymatic mechanism. Biochemistry 29:7742-7746
2. Zhang L., Wei L. (2007). ACTX-8, a cytotoxic L-amino acid oxidase isolated from Deinagkistrodon acutus snake venom, induces apoptosis in Hela cervical cancer cells.J.Life Sci. 80:1189-1197
3. Gomis-Rueth F.-X., Meyer E.F., Kress L.F., Politi V.(1998). Structures of adamalysin II with peptidic inhibitors. Implications for the design of tumor necrosis factor alpha convertase inhibitors.Protein Sci. 7:283-292

Data compiled from UniProt: Reorganizing the protein space at the Universal Protein Resource (UniProt), Nucleic Acids Res. 40: D71-D75 (2012).

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TOXIVEN BIOTECH PRIVATE LIMITED

Target:	Epigenetics –KDM and Bromodomains
Format:	Targeted Venom Discovery Array
Code:	T-VDA^{epi}

Product Description

Covalent modifications of DNA (e.g. cytosine methylation) or of histone proteins (e.g. lysine acetylation, lysine and arginine methylation, serine and threonine phosphorylation, and lysine ubiquitination and sumoylation) play central roles in many types of epigenetic regulation. Epigenetic factors that produce these modifications can be affected by development (in utero, childhood), environmental chemicals, drug/pharmaceuticals, ageing and diet which in turn can lead to cancer, autoimmune diseases, neurodegenerative disorders and diabetes. Given the large number of epigenetic factors, identifying small molecules and biologics with satisfactory selectivity profiles presents a huge challenge for epigenetic target drug discovery.

Work carried out by SGC Oxford and Venomtech has identified venoms with selectivity profiles and thus make this T-VDA a valuable resource for discovery of new Epigenetic modifier ligands.

- Venoms are supplied lyophilised in Echo® qualified acoustic source plates (Labcyte Inc) and are useable on any SBS footprint liquid handling device or by hand
- 384-well format has 200ng venom fraction per well, suggested dilution 20µl as hit fractions are typically active at 5µg/ml and below
- 1536-well format also available.

Results (published with permission from SGC Oxford)

➢KDMs –a number of venoms showed inhibition, especially for JMJD2A and JMJD3A with some selectivity over the JARID family of KDMs.

A generic chemical inhibitor (2,4,-PDCA) inhibited as expected all targets as expected

➢Bromodomains -a number of venoms show selective displacement of control peptides from the SGC bromodomain proteins, BRPF1B, CECR2A and FALZA, notably, venom 25 which shows selectivity between CECR2A and FALZA

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TOXIVEN BIOTECH PRIVATE LIMITED

Target:	G-Protein coupled receptors
Format:	Targeted Venom Discovery Array
Code:	T-VDA^{GPCR}

Product Description

Although not typically expected as pathways for venoms, GPCR modulation has been discovered in several snake venoms; such **as Muscarinic acetylcholine receptor blockers**. Snake venoms are rich source of GPCR tools such as the three-finger toxin motif that is particularly effective and binding GPCRs. These targeted arrays contain pure venom fractions from 12, 24, 48 or 96 species **optimised for identification of novel tools**. Every array contains characterised venoms active in GPCR pathways from the literature to act as positive controls. The control venoms for T-VDA^{GPCR} include *Crotalus atrox* (eastern diamondback rattlesnake) where **bradykinin B2 receptor antagonist** has been discovered[1]; *Dendroaspis augusticeps* (eastern green mamba) where several novel muscarinic receptor antagonists have been discovered[2]and *Najakaouthia* (Monocled cobra) venom which contains large abundance of three-finger proteins including those antagonising nicotinic and muscarinic nicotine receptors[3]. The other venom fractions making up the library have been specially selected by our drug discovery scientists to maximise novel hit potential.

- Venoms are supplied lyophilised in Echo® qualified acoustic source plates (Labcyte Inc) and are useable on any SBS footprint liquid handling device or by hand.
- 384-well format has 200ng venom fraction per well, suggested dilution 20µl as hit fractions are typically active at 5µg/ml and below.
- 1536-well format also available.

1. Calvete J.J., Fasoli E., Sanz L., Boschetti E., Righetti P.G. (2009). Exploring the venom proteome of the western diamondback rattlesnake, *Crotalus atrox*, via snake venomics and combinatorial peptide ligand library approaches. J. Proteome Res. 8:3055-3067
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3. Utkin Y.N., Kukhtina V.V., Kryukova E.V., Chiodini F., Bertrand D., Methfessel C., Tsetlin V.I. (2001). 'Weak toxin' from *Naja kaouthia* is a nontoxic antagonist of alpha 7 and muscle-type nicotinic acetylcholine receptors. J. Biol. Chem. 276:15810-15815

Data compiled from UniProt: Reorganizing the protein space at the Universal Protein Resource (UniProt), Nucleic Acids Res. 40: D71-D75 (2012).

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TOXIVEN BIOTECH PRIVATE LIMITED

Target:	S100
Format:	Targeted Venom Discovery Array
Code:	T-VDA^{S100}

Product Description

The S100 proteins are characterized by two calcium-binding sites that have helix-loop-helix ("EF-hand type") conformation. There are at more than 20 different S100 proteins, which are involved in proliferation, differentiation, apoptosis, Ca2+homeostasis, energy metabolism, inflammation and migration/invasion through interactions with enzymes, cytoskeletal subunits, receptors, transcription factors and nucleic acids. S100 proteins have been associated with several human diseases including autoimmunity, cardiomyopathy, neurodegenerative disorders and cancer. For example, dysregulated expression of multiple members of the S100 family is a common feature of human cancers, with each type of cancer showing a unique S100 protein profile or signature and elevated levels of S100A8/A9, pro-inflammatory proteins have been widely associated with Systemic lupus erythematosus (SLE).Work carried out by SGC Oxford and Venomtech has identified venoms with selectivity profiles and thus make this T-VDA a valuable resource for discovery of new S100 ligands.

- Venoms are supplied lyophilised in Echo® qualified acoustic source plates (Labcyte Inc) and are useable on any SBS footprint liquid handling device or by hand.
- 384-well format has 200ng venom fraction per well, suggested dilution 20µl as hit fractions are typically active at 5µg/ml and below.
- 1536-well format also available.

Results (Published with permission from SGC Oxford)

➢ A number of venoms show selective displacement of the control peptides from the S100 protein, notably venom 25 which shows selectivity for S100B.

➢ S100B was the most likely to be displaced by venom followed by S100A4 and then lastly by S100A1

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TOXIVEN BIOTECH PRIVATE LIMITED

Target:	**Hit-to-Lead Service**
Format:	
Code	T-VDA^{HTLS}

Unlock the full potential of the Targeted Venom Discovery Arrays™ (T-VDAs) with this custom hit characterisation and lead optimisation service. The Venomtech® team have decades of experience in global pharmaceutical drug discovery coupled with specialist knowledge of venoms and venomous animals. Using our industry-leading proprietary safe working practices we turn millions of years of evolution into the ultimate drug discovery pipeline. This starts with the T-VDA already optimised to provide biological tools in areas where synthetic chemistry has failed or where a biological is specifically sought.

The quarterly subscription covers:

•Characterisation of active fractions (LC-MS, MALDI TOF, MS/MS)

•Separation to single actives where desired

•Resupply of actives for dose response testing

•Provision of extra targeted venoms to improve potency and/ or selectivity

•Identification of potential SAR (Structural Activity Relationship)

•Small scale synthesis of the active

•Full confidential project report with strategic projections

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