
# Vax, Vax Shedding & Detox

Dr. Bryan Ardis D.C.

THE dr.ardis SHOW

## FREE RESOURCES

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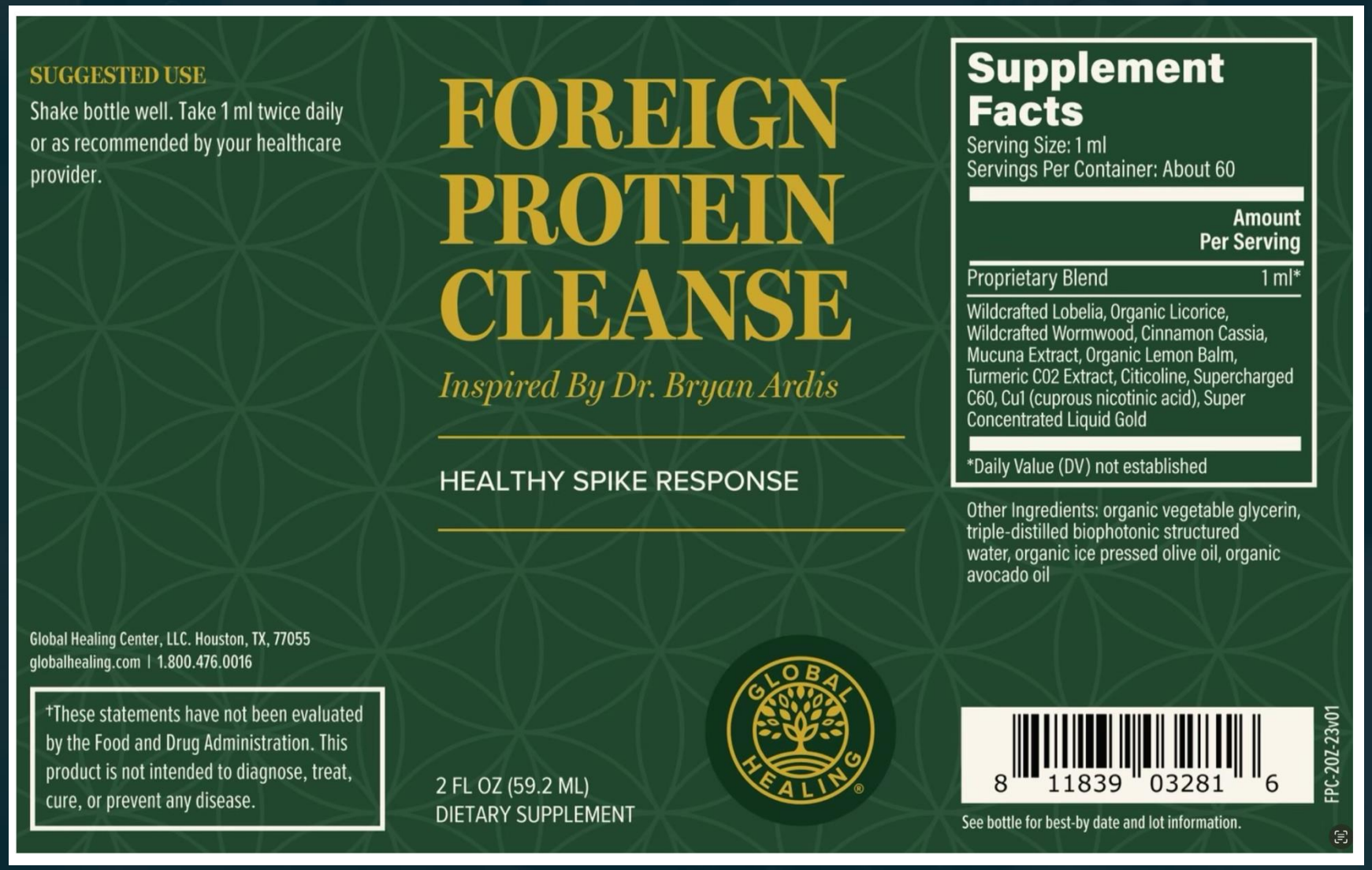



# Supplement Facts

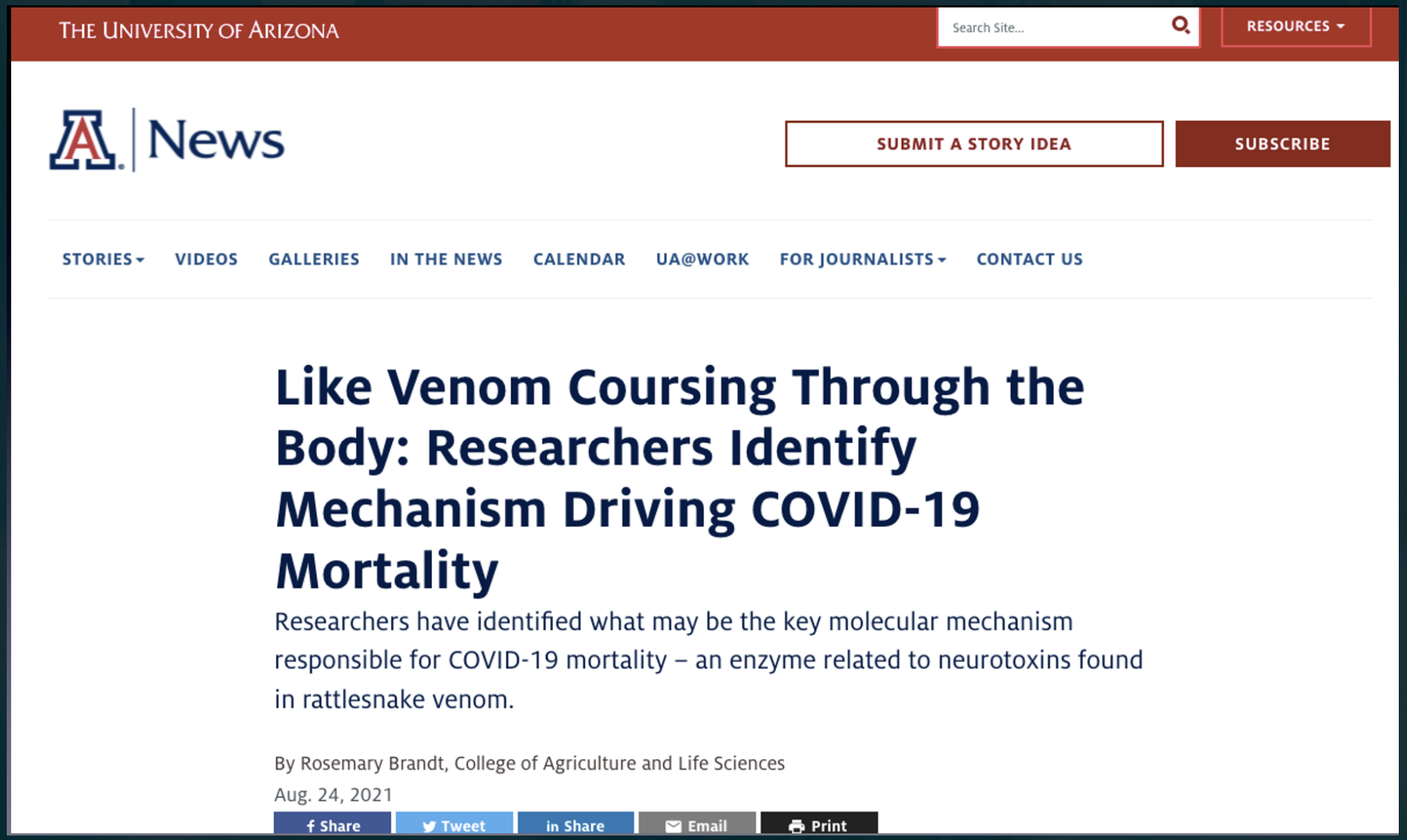
Serving Size: 1 ml
Servings Per Container: About 60

| | Amount Per Serving |
|---|---|
| Proprietary Blend | 1 ml* |

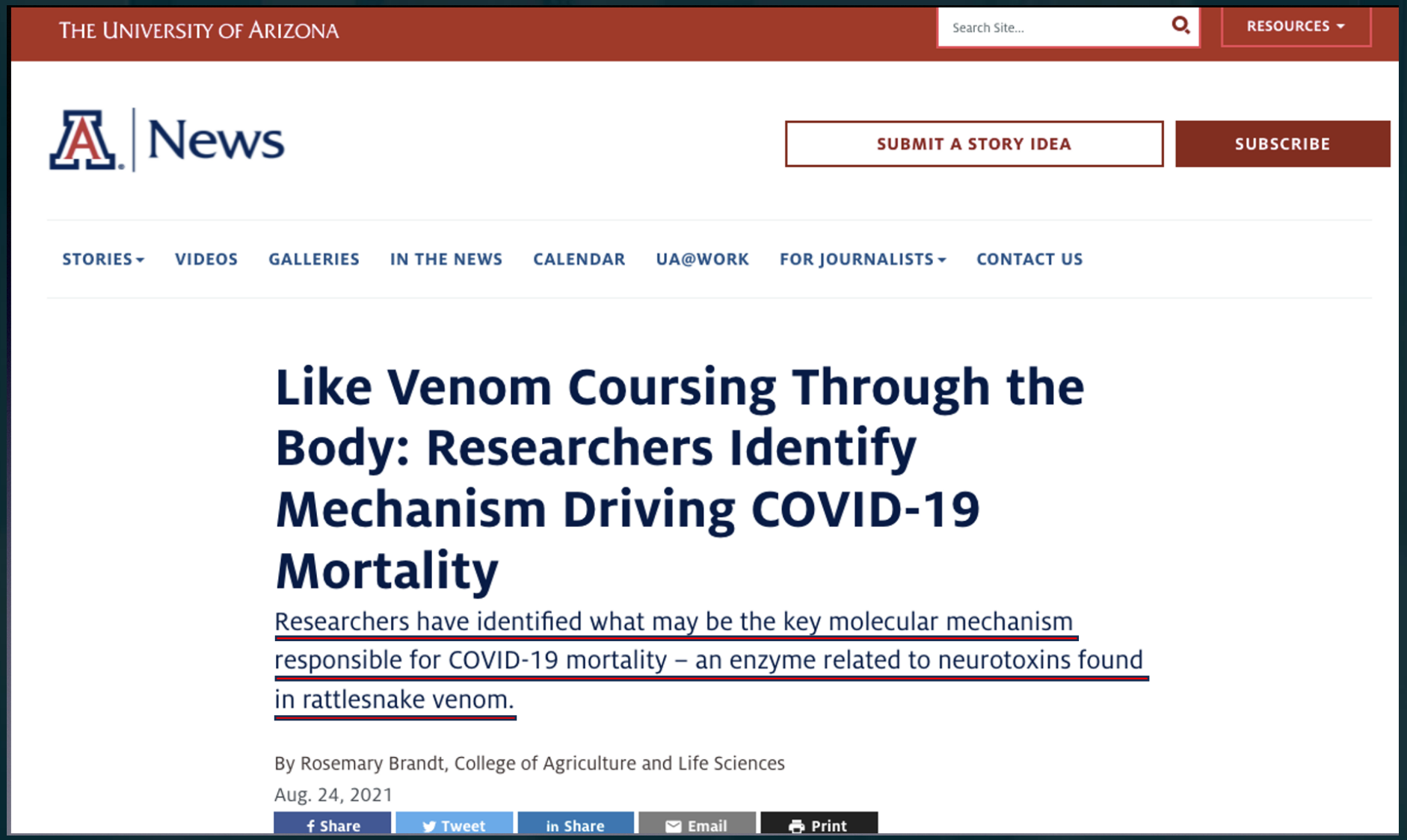
Wildcrafted Lobelia, Organic Licorice, Wildcrafted Wormwood, Cinnamon Cassia, Mucuna Extract, Organic Lemon Balm, Turmeric C02 Extract, Citicoline, Supercharged C60, Cu1 (cuprous nicotinic acid), Super Concentrated Liquid Gold

*Daily Value (DV) not established

Other Ingredients: organic vegetable glycerin, triple-distilled biophotonic structured water, organic ice pressed olive oil, organic avocado oil




https://news.arizona.edu/story/venom-coursing-through-body-researchers-identify-mechanism-driving-covid-19-mortality

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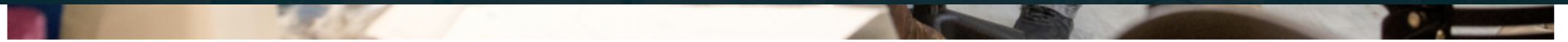

In a photo taken prior to the pandemic, Dr. Chilton (second from left) and his lab team examine how genetic and epigenetic variations interact with human diets to drive inflammation and inflammatory disorders, as well as psychiatric and developmental disorders.

*Chris Richards/University of Arizona*

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Researchers from the University of Arizona, in collaboration with Stony Brook University and Wake Forest School of Medicine, analyzed blood samples from two COVID-19 patient cohorts and found that circulation of the enzyme – secreted phospholipase A2 group IIA, or sPLA2-IIA, – may be the most important factor in predicting which patients with severe COVID-19 eventually succumb to the virus.

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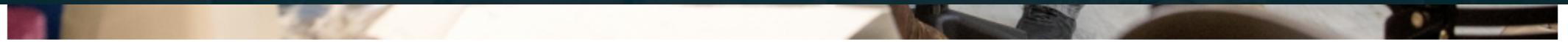

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RESEARCH ARTICLE

# REVISED Toxin-like peptides in plasma, urine and faecal samples from COVID-19 patients [version 2; peer review: 2 approved]

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[1]Craniomed group srl, Montemiletto, 83038, Italy
[2]ISB Ion Source & Biotechnologies srl, Italy, Bresso, Milano, 20091, Italy
[3]European Commission, Joint Research Centre (JRC), Ispra, 21027, Italy
[4]Department of Medicine and Surgery, University of Salerno, Baronissi, 84081, Italy
[5]European Commission, Joint Research Centre (JRC), Geel, 2440, Belgium

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https://doi.org/10.12688/f1000research.54306.1

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**Methods:** Plasma, urine and faecal samples from COVID-19 patients and control individuals were analysed to study peptidomic toxins' profiles. precipitation preparation procedure was used for plasma, to remove high molecular weight proteins and efficiently solubilize the peptide fraction; in the case of faeces and urine, direct peptide solubilization was employed.

**Results:** Toxin-like peptides, almost identical to toxic components of venoms from animals, like conotoxins, phospholipases, phosphodiesterases, zinc metal proteinases, and bradykinins, were identified in samples from COVID-19 patients, but not in control samples.

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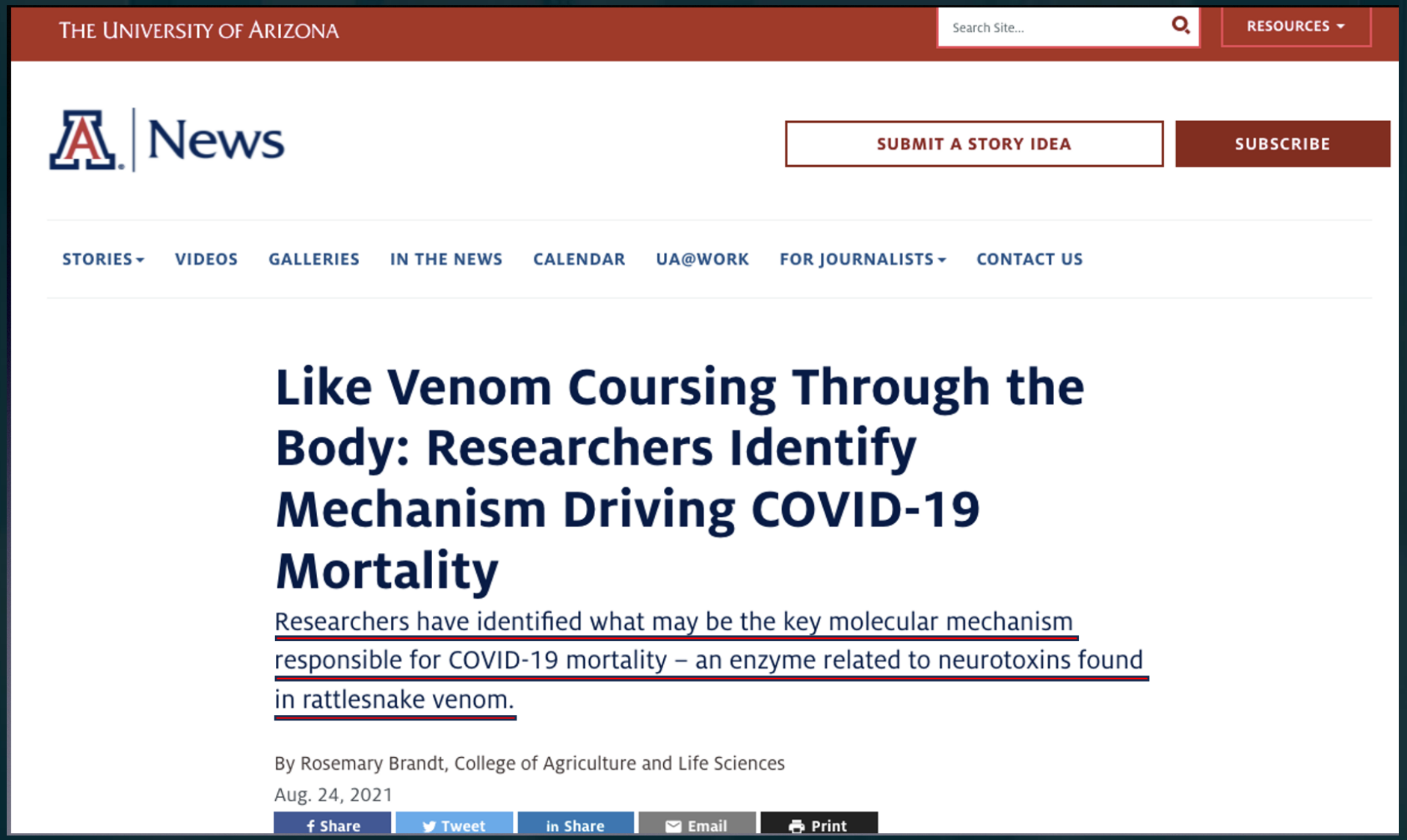


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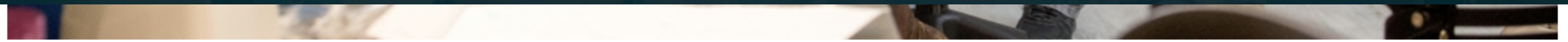

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| A6MEY4 | PA2B_BUNFA | reviewed | Basic phospholipase A2 BFPA | EC 3.1.1.4 | . Antimicrobial phospholipase A2<br>. Phosphatidylcholine 2-acylhydrolase (svPLA2) | 145 | 8613 | *Bungarus fasciatus* | ***Chordata*** *- Elapidae* | . Banded krait<br>. Pseudoboa fasciata |
| F5CPF1 | PA235_MICAT | reviewed | Phospholipase A2 MALT0035C | EC 3.1.1.4 | . Phospholipase A2 MALT0035C (svPLA2) | 142 | 129457 | *Micrurus altirostris* | ***Chordata*** *- Elapidae* | . Uruguayan coral snake<br>. Elaps altirostris |
| A8QL59 | VM3_NAJAT | reviewed | Zinc metalloproteinase-disintegrin-like NaMP | EC 3.4.24.- | . Snake venom metalloproteinase (SVMP) | 621 | 8656 | *Naja atra* | ***Chordata*** *- Elapidae* | . Chinese cobra |
| Q9I900 | PA2AD_NAJSP | reviewed | Acidic phospholipase A2 D | EC 3.1.1.4 | . svPLA2<br>. APLA<br>. Phosphatidylcholine 2-acylhydrolase | 146 | 33626 | *Naja sputatrix* | ***Chordata*** *- Elapidae* | . Malayan spitting cobra<br>. Naja naja sputatrix |
| Q58L90 | FA5V_OXYMI | reviewed | Venom prothrombin activator omicarin-C non-catalytic subunit | NA | . vPA<br>. Venom coagulation factor Va-like protein<br>*Cleaved into 2 chains* | 1460 | 111177 | *Oxyuranus microlepidotus* | ***Chordata*** *- Elapidae* | . Inland taipan<br>. Diemenia microlepidota |
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| Q9W7J9 | 3S34_PSETE | reviewed | Short neurotoxin 4 | NA | . SNTX4<br>. Alpha-neurotoxin 4 | 79 | 8673 | *Pseudonaja textilis* | ***Chordata*** *- Elapidae* | . Eastern brown snake |
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| Q2PG83 | PA2A_PROEL | reviewed | Acidic phospholipase A2 PePLA2 | EC 3.1.1.4 | . Phosphatidylcholine 2-acylhydrolase (svPLA2) | 138 | 88086 | *Protobothrops elegans* | ***Chordata*** *- Viperidae* | Elegant pitviper<br>Trimeresurus elegans |
| P06860 | PA2BX_PROFL | reviewed | Basic phospholipase A2 PL-X | EC 3.1.1.4 | . Phosphatidylcholine 2-acylhydrolase (svPLA2) | 122 | 88087 | *Protobothrops flavoviridis* | ***Chordata*** *- Viperidae* | . Habu<br>. Trimeresurus flavoviridis |
| P0C7P5 | BNP_PROFL | reviewed | Bradykinin-potentiating and C-type natriuretic peptides | NA | . BPP-CNP<br>*Cleaved into 6 chains* | 193 | 88087 | *Protobothrops flavoviridis* | ***Chordata*** *- Viperidae* | . Habu<br>. Trimeresurus flavoviridis |
| Q3C2C2 | PA21_ACAPL | reviewed | Phospholipase A2 AP-PLA2-I | EC 3.1.1.4 | . Phosphatidylcholine 2-acylhydrolase (svPLA2) | 159 | 133434 | *Acanthaster planci* | ***Echinodermata*** *- Acanthasteridae* | . Crown-of-thorns starfish |
| D6C4M3 | CU96_CONCL | reviewed | Conotoxin Cl9.6 | NA | . Conotoxin Cl9.6 | 81 | 1736779 | *Californiconus californicus* | ***Mollusca*** *- Conidae* | . California cone - Conus californicus |
| D2Y488 | VKT1A_CONCL | reviewed | Kunitz-type serine protease inhibitor conotoxin Cal9.1a | NA | - | 78 | 1736779 | *Californiconus californicus* | ***Mollusca*** *- Conidae* | . California cone<br>. Conus californicus |
| D6C4J8 | CUE9_CONCL | reviewed | Conotoxin Cl14.9 | NA | - | 78 | 1736779 | *Californiconus californicus* | ***Mollusca*** *- Conidae* | . California cone<br>. Conus californicus |
| P0DPT2 | CA1B_CONCT | reviewed | Alpha-conotoxin ClB [Fragment] | NA | . C1.2 | 41 | 101291 | *Conus catus* | ***Mollusca*** *- Conidae* | . Cat cone |
| V5V893 | CQG3_CONFL | reviewed | Conotoxin Fla16d | NA | . Conotoxin Fla16d<br>*Cleaved into 2 chains* | 76 | 101302 | *Conus flavidus* | ***Mollusca*** *- Conidae* | . Yellow Pacific cone |
| P58924 | CS8A_CONGE | reviewed | Sigma-conotoxin GVIIIA | NA | . Sigma-conotoxin GVIIIA | 88 | 6491 | *Conus geographus* | ***Mollusca*** *- Conidae* | . Geography cone<br>. Nubecula geographus |
| P0DM19 | NF2_CONMR | reviewed | Conotoxin Mr15.2 | NA | . Conotoxin Mr15.2 (Mr094) | 92 | 42752 | *Conus marmoreus* | ***Mollusca*** *- Conidae* | . Marble cone |
| P0C1N5 | M3G_CONMR | reviewed | Conotoxin mr3g | NA | . Conotoxin mr3g (Mr3.6) | 68 | 42752 | *Conus marmoreus* | ***Mollusca*** *- Conidae* | . Marble cone |

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| UNIPROTKB CANDIDATE'S INFORMATION | | | | | | | TAXONOMY CANDIDATE'S INFORMATION | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| *AC* | *ID* | *Status* | *Protein name* | *ENZYME EC* | *Other name(s)* | *Length (aa)* | *ID* | *Species* | *Phylum - Family* | *Organism's common name(s)* |
| Q2PG83 | PA2A_PROEL | reviewed | Acidic phospholipase A2 PePLA2 | EC 3.1.1.4 | . Phosphatidylcholine 2-acylhydrolase (svPLA2) | 138 | 88086 | *Protobothrops elegans* | ***Chordata*** *- Viperidae* | Elegant pitviper<br>Trimeresurus elegans |
| P06860 | PA2BX_PROFL | reviewed | Basic phospholipase A2 PL-X | EC 3.1.1.4 | . Phosphatidylcholine 2-acylhydrolase (svPLA2) | 122 | 88087 | *Protobothrops flavoviridis* | ***Chordata*** *- Viperidae* | Habu<br>Trimeresurus flavoviridis |
| P0C7P5 | BNP_PROFL | reviewed | Bradykinin-potentiating and C-type natriuretic peptides | NA | . BPP-CNP<br>*Cleaved into 6 chains* | 193 | 88087 | *Protobothrops flavoviridis* | ***Chordata*** *- Viperidae* | . Habu<br>. Trimeresurus flavoviridis |
| Q3C2C2 | PA21_ACAPL | reviewed | Phospholipase A2 AP-PLA2-I | EC 3.1.1.4 | . Phosphatidylcholine 2-acylhydrolase (svPLA2) | 159 | 133434 | *Acanthaster planci* | ***Echinodermata*** *- Acanthasteridae* | . Crown-of-thorns starfish |
| D6C4M3 | CU96_CONCL | reviewed | Conotoxin Cl9.6 | NA | . Conotoxin Cl9.6 | 81 | 1736779 | *Californiconus californicus* | ***Mollusca*** *- Conidae* | . California cone - Conus californicus |
| D2Y488 | VKT1A_CONCL | reviewed | Kunitz-type serine protease inhibitor conotoxin Cal9.1a | NA | - | 78 | 1736779 | *Californiconus californicus* | ***Mollusca*** *- Conidae* | . California cone<br>. Conus californicus |
| D6C4J8 | CUE9_CONCL | reviewed | Conotoxin Cl14.9 | NA | - | 78 | 1736779 | *Californiconus californicus* | ***Mollusca*** *- Conidae* | . California cone<br>. Conus californicus |
| P0DPT2 | CA1B_CONCT | reviewed | Alpha-conotoxin ClB [Fragment] | NA | . C1.2 | 41 | 101291 | *Conus catus* | ***Mollusca*** *- Conidae* | . Cat cone |
| V5V893 | CQG3_CONFL | reviewed | Conotoxin Fla16d | NA | . Conotoxin Fla16d<br>*Cleaved into 2 chains* | 76 | 101302 | *Conus flavidus* | ***Mollusca*** *- Conidae* | . Yellow Pacific cone |
| P58924 | CS8A_CONGE | reviewed | Sigma-conotoxin GVIIIA | NA | . Sigma-conotoxin GVIIIA | 88 | 6491 | *Conus geographus* | ***Mollusca*** *- Conidae* | . Geography cone<br>. Nubecula geographus |
| P0DM19 | NF2_CONMR | reviewed | Conotoxin Mr15.2 | NA | . Conotoxin Mr15.2 (Mr094) | 92 | 42752 | *Conus marmoreus* | ***Mollusca*** *- Conidae* | . Marble cone |
| P0C1N5 | M3G_CONMR | reviewed | Conotoxin mr3g | NA | . Conotoxin mr3g (Mr3.6) | 68 | 42752 | *Conus marmoreus* | ***Mollusca*** *- Conidae* | . Marble cone |

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| *AC* | *ID* | *Status* | *Protein name* | *ENZYME EC* | *Other name(s)* | *Length (aa)* | *ID* | *Species* | *Phylum - Family* | *Organism's common name(s)* |
| Q2PG83 | PA2A_PROEL | reviewed | Acidic phospholipase A2 PePLA2 | EC 3.1.1.4 | . Phosphatidylcholine 2-acylhydrolase (svPLA2) | 138 | 88086 | *Protobothrops elegans* | ***Chordata*** *- Viperidae* | Elegant pitviper<br>Trimeresurus elegans |
| P06860 | PA2BX_PROFL | reviewed | Basic phospholipase A2 PL-X | EC 3.1.1.4 | . Phosphatidylcholine 2-acylhydrolase (svPLA2) | 122 | 88087 | *Protobothrops flavoviridis* | ***Chordata*** *- Viperidae* | Habu<br>Trimeresurus flavoviridis |
| P0C7P5 | BNP_PROFL | reviewed | Bradykinin-potentiating and C-type natriuretic peptides | NA | . BPP-CNP<br>*Cleaved into 6 chains* | 193 | 88087 | *Protobothrops flavoviridis* | ***Chordata*** *- Viperidae* | . Habu<br>. Trimeresurus flavoviridis |
| Q3C2C2 | PA21_ACAPL | reviewed | Phospholipase A2 AP-PLA2-I | EC 3.1.1.4 | . Phosphatidylcholine 2-acylhydrolase (svPLA2) | 159 | 133434 | *Acanthaster planci* | ***Echinodermata*** *- Acanthasteridae* | Crown-of-thorns starfish |
| D6C4M3 | CU96_CONCL | reviewed | Conotoxin Cl9.6 | NA | . Conotoxin Cl9.6 | 81 | 1736779 | *Californiconus californicus* | ***Mollusca*** *- Conidae* | . California cone - Conus californicus |
| D2Y488 | VKT1A_CONCL | reviewed | Kunitz-type serine protease inhibitor conotoxin Cal9.1a | NA | - | 78 | 1736779 | *Californiconus californicus* | ***Mollusca*** *- Conidae* | . California cone<br>. Conus californicus |
| D6C4J8 | CUE9_CONCL | reviewed | Conotoxin Cl14.9 | NA | - | 78 | 1736779 | *Californiconus californicus* | ***Mollusca*** *- Conidae* | . California cone<br>. Conus californicus |
| P0DPT2 | CA1B_CONCT | reviewed | Alpha-conotoxin ClB [Fragment] | NA | . C1.2 | 41 | 101291 | *Conus catus* | ***Mollusca*** *- Conidae* | . Cat cone |
| V5V893 | CQG3_CONFL | reviewed | Conotoxin Fla16d | NA | . Conotoxin Flal6d<br>*Cleaved into 2 chains* | 76 | 101302 | *Conus flavidus* | ***Mollusca*** *- Conidae* | . Yellow Pacific cone |
| P58924 | CS8A_CONGE | reviewed | Sigma-conotoxin GVIIIA | NA | . Sigma-conotoxin GVIIIA | 88 | 6491 | *Conus geographus* | ***Mollusca*** *- Conidae* | . Geography cone<br>. Nubecula geographus |
| P0DM19 | NF2_CONMR | reviewed | Conotoxin Mr15.2 | NA | . Conotoxin Mr15.2 (Mr094) | 92 | 42752 | *Conus marmoreus* | ***Mollusca*** *- Conidae* | . Marble cone |
| P0C1N5 | M3G_CONMR | reviewed | Conotoxin mr3g | NA | . Conotoxin mr3g (Mr3.6) | 68 | 42752 | *Conus marmoreus* | ***Mollusca*** *- Conidae* | . Marble cone |

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|---|---|---|---|---|---|---|---|---|---|---|
| *AC* | *ID* | *Status* | *Protein name* | *ENZYME EC* | *Other name(s)* | *Length (aa)* | *ID* | *Species* | *Phylum - Family* | *Organism's common name(s)* |
| Q7SZN0 | FA5V_PSETE | reviewed | Venom prothrombin activator pseutarin-C non-catalytic subunit | NA | . PCNS<br>. vPA<br>. Venom coagulation factor Va-like protein<br>*Cleaved into 2 chains* | 1460 | 8673 | *Pseudonaja textilis* | ***Chordata*** *- Elapidae* | . Eastern brown snake |
| Q2XXQ3 | CRVP1_PSEPL | reviewed | Cysteine-rich venom protein ENH1 | NA | . CRVP<br>. Cysteine-rich secretory protein ENH1 (CRISP-ENH1) | 239 | 338839 | *Pseudoferania polylepis* | ***Chordata*** *- Homalopsidae* | . Macleay's water snake<br>. Enhydris polylepis |
| Q9PW56 | BNP2_BOTJA | reviewed | Bradykinin-potentiating and C-type natriuretic peptides | NA | . Brain BPP-CNP<br>. Evasin-CNP<br>*Cleaved into the 12 chains* | 265 | 8724 | *Bothrops jararaca* | ***Chordata*** *- Viperidae* | . Jararaca |
| A8YPR6 | SVMI_ECHOC | reviewed | Snake venom metalloprotease inhibitor | NA | . 02D01<br>. 02E11<br>. 10F07<br>. Svmpi-Eoc7<br>*Cleaved into 15 chains* | 308 | 99586 | *Echis ocellatus* | ***Chordata*** *- Viperidae* | . Ocellated saw-scaled viper |
| Q698K8 | VM2L4_GLOBR | reviewed | Zinc metalloproteinase/ disintegrin [Fragment] | EC 3.4.24- | *Cleaved into 3 chains* | 319 | 259325 | *Gloydius brevicaudus* | ***Chordata*** *- Viperidae* | . Korean slamosa snake<br>. Agkistrodon halys brevicaudus |
| Q8AWI5 | VM3HA_GLOHA | reviewed | Zinc metalloproteinase-disintegrin-like halysase | EC 3.4.24- | . Zinc metalloproteinase-disintegrin-like halysase<br>. Snake venom metalloproteinase (SVMP)<br>. Vascular apoptosis-inducing protein (VAP) | 610 | 8714 | *Gloydius halys* | ***Chordata*** *- Viperidae* | . Chinese water mocassin<br>. Agkistrodon halys |
| P82662 | 3L26_OPHHA | reviewed | Alpha-neurotoxin | NA | . Alpha-elapitoxin-Oh2b (Alpha-EPTX-Oh2b)<br>. Alpha-elapitoxin-Oh2b<br>. LNTX3<br>. Long neurotoxin OH-6A/OH-6B<br>. OH-3 | 91 | 8665 | *Ophiophagus hannah* | ***Chordata*** *- Viperidae* | . King cobra<br>. Naja hannah |

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| UNIPROTKB CANDIDATE'S INFORMATION | | | | | | | TAXONOMY CANDIDATE'S INFORMATION | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **AC** | **ID** | **Status** | **Protein name** | **ENZYME EC** | **Other name(s)** | **Length (aa)** | **ID** | **Species** | **Phylum - Family** | **Organism's common name(s)** |
| D2DGD8 | I361_CONPL | reviewed | Conotoxin Pu6.1 | NA | - | 83 | 93154 | *Conus pulicarius* | ***Mollusca*** *- Conidae* | . Flea-bite cone |
| P0C8U9 | CA15_CONPL | reviewed | Alpha-conotoxin-like Pu1.5 | NA | - | 81 | 93154 | *Conus pulicarius* | ***Mollusca*** *- Conidae* | . Flea-bite cone |
| A1X8B8 | CAI_CONQU | reviewed | Putative alpha-conotoxin Qc alphaL-1 | NA | . QcaL-1 | 68 | 101313 | *Conus quercinus* | ***Mollusca*** *- Conidae* | . Oak cone |
| P58786 | COW_CONRA | reviewed | Contryphan-R | NA | . Bromocontryphan<br>*Cleaved into 2chains* | 63 | 61198 | *Conus radiatus* | ***Mollusca*** *- Conidae* | . Rayed cone |
| P58811 | CA1A_CONTU | reviewed | Rho-conotoxin TIA | NA | . Rho-TIA | 58 | 6495 | *Conus tulipa* | ***Mollusca*** *- Conidae* | . Fish-hunting cone snail<br>. Tulip cone |
| Q5K0C5 | 016A_CONVR | reviewed | Conotoxin 10 | NA | - | 79 | 89427 | *Conus virgo* | ***Mollusca*** *- Conidae* | . Virgin cone |
| B3FIA5 | CVFA_CONVR | reviewed | Conotoxin Vi15a | NA | . Conotoxin Vi15.l | 74 | 8765 | *Conus virgo* | ***Mollusca*** *- Conidae* | . Virgin cone |

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# Foreign Protein Cleanse

| Protein name |
| --- |
| Kunitz-type serine protease inhibitor homolog beta-bungarotoxin B1 chain |
| Basic phospholipase A2 BFPA |
| Phospholipase A2 MALT0035C |
| Zinc metalloproteinase-disintegrin-like NaMP |
| Acidic phospholipase A2 D |
| Venom prothrombin activator omicarin-C non-catalytic subunit |
| Venom prothrombin activator oscutarin-C non-catalytic subunit |
| Short neurotoxin 4 |
| Acidic phospholipase A2 homolog |

| Protein name |
| --- |
| Acidic phospholipase A2 PePLA2 |
| Basic phospholipase A2 PL-X |
| Bradykinin-potentiating and C-type natriuretic peptides |
| Phospholipase A2 AP-PLA2-I |
| Conotoxin Cl9.6 |
| Kunitz-type serine protease inhibitor conotoxin Cal9.1a |
| Conotoxin Cl14.9 |
| Alpha-conotoxin ClB [Fragment] |
| Conotoxin Fla16d |
| Sigma-conotoxin GVIIIA |
| Conotoxin Mr15.2 |
| Conotoxin mr3g |

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## Like Venom Coursing Through the Body: Researchers Identify Mechanism Driving COVID-19 Mortality

Researchers have identified what may be the key molecular mechanism responsible for COVID-19 mortality – an enzyme related to neurotoxins found in rattlesnake venom.

By Rosemary Brandt, College of Agriculture and Life Sciences

Aug. 24, 2021

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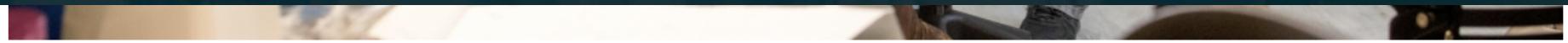
# Foreign Protein Cleanse

| Protein name |
| --- |
| Kunitz-type serine protease inhibitor homolog beta-bungarotoxin B1 chain |
| Basic phospholipase A2 BFPA |
| Phospholipase A2 MALT0035C |
| Zinc metalloproteinase-disintegrin-like NaMP |
| Acidic phospholipase A2 D |
| Venom prothrombin activator omicarin-C non-catalytic subunit |
| Venom prothrombin activator oscutarin-C non-catalytic subunit |
| Short neurotoxin 4 |
| Acidic phospholipase A2 homolog |

| Protein name |
| --- |
| Acidic phospholipase A2 PePLA2 |
| Basic phospholipase A2 PL-X |
| Bradykinin-potentiating and C-type natriuretic peptides |
| Phospholipase A2 AP-PLA2-I |
| Conotoxin Cl9.6 |
| Kunitz-type serine protease inhibitor conotoxin Cal9.1a |
| Conotoxin Cl14.9 |
| Alpha-conotoxin ClB [Fragment] |
| Conotoxin Fla16d |
| Sigma-conotoxin GVIIIA |
| Conotoxin Mr15.2 |
| Conotoxin mr3g |



In a photo taken prior to the pandemic, Dr. Chilton (second from left) and his lab team examine how genetic and epigenetic variations interact with human diets to drive inflammation and inflammatory disorders, as well as psychiatric and developmental disorders.

*Chris Richards/University of Arizona*

An enzyme with an elusive role in severe inflammation may be a key mechanism driving COVID-19 severity and could provide a new therapeutic target to reduce COVID-19 mortality, according to a **study** published in the Journal of Clinical Investigation.

Researchers from the University of Arizona, in collaboration with Stony Brook University and Wake Forest School of Medicine, analyzed blood samples from two COVID-19 patient cohorts and found that circulation of the enzyme – secreted phospholipase A2 group IIA, or sPLA2-IIA, – may be the most important factor in predicting which patients with severe COVID-19 eventually succumb to the virus.

**https://news.arizona.edu/story/venom-coursing-through-body-researchers-identify-mechanism-driving-covid-19-mortality**


# Supplement Facts

Serving Size: 1 ml
Servings Per Container: About 60

| | Amount Per Serving |
|---|---|
| Proprietary Blend | 1 ml* |

Wildcrafted Lobelia, Organic Licorice, Wildcrafted Wormwood, Cinnamon Cassia, Mucuna Extract, Organic Lemon Balm, Turmeric C02 Extract, Citicoline, Supercharged C60, Cu1 (cuprous nicotinic acid), Super Concentrated Liquid Gold

*Daily Value (DV) not established

Other Ingredients: organic vegetable glycerin, triple-distilled biophotonic structured water, organic ice pressed olive oil, organic avocado oil

# NATURAL SOLUTIONS TO secretory Phospholipase a2 (sPLA2)

*Pharmacologyonline* 2: 1032-1038 (2011) Newsletter Harwansh *et al.*

## PHARMACOLOGICAL STUDIES ON *GLYCYRRHIZA GLABRA*:

## A REVIEW

R. K. Harwansh*[1], K. C. Patra[1], S. K. Pareta[1], J. Singh[1], R. Biswas[2]

[1]*SLT Institute of Pharmaceutical Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) - 495001, India*

[2]*Department of pharmaceutical Technology, Jadavpur University, Kolkata -700032, West Bengal, India*

### Summary

https://www.researchgate.net/publication/305386640_Pharmacological_studies_on_Glycyrrhiza_glabra073

# NATURAL SOLUTIONS TO secretory Phospholipase a2 (sPLA2)

## Introduction

Liquorice is the root and rhizome of the Glycyrrhiza plant, which belongs to the family Leguminosae. This plant has been recognized worldwide as an important medicinal herb since ancient times [1, 2, 3]. The main taproot, which is harvested for medicinal use, is soft, fibrous, and has a bright yellow interior [4]. Glycyrrhiza is derived from the ancient Greek term *glykos,* meaning sweet, and *rhiza*, meaning root. Glycyrrhizin (GZ) Figure 1, a major component of liquorice (*Glycyrrhiza glabra* L.), is used as a remedy for chronic hepatitis, allergies, and other remedies [5]. It has been reported that liquorice is effective in gastric ulcer treatment [6] and glycyrrhetinic acid, the aglycone of glycyrrhizin, has an anti-inflammatory and antiulcer effect [7]. Liquorice constituents also exhibit anti-arthritic, anti-arrhythmic, antibacterial, antiviral, expectorant [8] and steroid like anti-inflammatory activity, similar to the action of hydrocortisone. This is due, in part, to inhibition of phospholipase A2 activity, an enzyme critical to numerous inflammatory processes [9]. *In vitro* research has also demonstrated glycyrrhizic acid inhibits cyclooxygenase activity and prostaglandin formation (specifically prostaglandin E2), as well as indirectly inhibiting platelet aggregation, all factors in the inflammatory process [9,

https://www.researchgate.net/publication/305386640_Pharmacological_studies_on_Glycyrrhiza_glabra073

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# NATURAL SOLUTIONS TO secretory Phospholipase a2 (sPLA2)


## Summary

*Glycyrrhiza glabra*, also known as liquorice and sweetwood, is native to the Mediterranean and certain areas of Asia. Historically, the dried rhizome and root of this plant were used medicinally by the Egyptian, Chinese, Greek, Indian and Roman civilizations as carminative, expectorant and cough remedies. It is now known that glycyrrhizic acid and its aglycone glycyrrhetinic acid present in the root extract are responsible for the biological activities. In modern medicine, liquorice extracts are employed as parenteral preparation for Chronic Hepatitis, Ulcer, viral infection and some common diseases. In Japan, it is used as pharmaceutical preparation since, 1960 years. In the present context glycyrrhizin and its derivative is focus on pharmacological studies, against disease viz. HIV syndrome, Hepatitis, H1N1 flue, cancer and diabetes etc.



**Keywords**: Liquorice, Glycyrrhizin, Leguminosae, Sweetwood, Traditional


https://www.researchgate.net/publication/305386640_Pharmacological_studies_on_Glycyrrhiza_glabra073

# NATURAL SOLUTIONS TO secretory Phospholipase a2 (sPLA2)

**Antiviral**

Glycyrrhizin has a prominent antiviral activity, as it does not allow the virus cell binding. It has been reported as HIV-1, japanese encephalitis virus and yellow fever virus. Recently antiviral activities of ribavirin, 6-azauridine, pyraziofurin, mycophenolic acid and glycyrrhizin against two clinical isolates of SARS (Severe Acute Respiratory Syndrome) virus (FFM-1 and FFM-2) from patients with SARS, admitted to clinical center of Frankfurt University, Germany were evaluated and it was observed that glycyrrhizin was the most effective in controlling viral replication and could be used as a prophylactic measure; glycyrrhizin has been previously used to treat patients suffering from HIV-1 and chronic hepatitis C virus [30, 31, 32].

**Antioxidant and Antiinflammatory**

Extract of glycyrrhiza has exhibited a marked hepatoprotective action by antioxidant activity of liver against ascorbic acid dependent oxidation of endogenous polyenic lipids in rat liver. Glycyrrhiza (root) have a plenty of polyphenolic components as a potential source of

https://www.researchgate.net/publication/305386640_Pharmacological_studies_on_Glycyrrhiza_glabra073


# Supplement Facts

Serving Size: 1 ml
Servings Per Container: About 60

| | Amount Per Serving |
|---|---|
| Proprietary Blend | 1 ml* |

Wildcrafted Lobelia, Organic Licorice, Wildcrafted Wormwood, Cinnamon Cassia, Mucuna Extract, Organic Lemon Balm, Turmeric C02 Extract, Citicoline, Supercharged C60, Cu1 (cuprous nicotinic acid), Super Concentrated Liquid Gold

*Daily Value (DV) not established

Other Ingredients: organic vegetable glycerin, triple-distilled biophotonic structured water, organic ice pressed olive oil, organic avocado oil

# NATURAL SOLUTIONS TO secretory Phospholipase a2 (sPLA2)

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> Recent Pat Biotechnol. 2020;14(2):134-144. doi: 10.2174/1872208313666191025110019.

## Detoxifying Action of Aqueous Extracts of *Mucuna pruriens* Seed and *Mimosa pudica* Root Against Venoms of *Naja nigricollis* and *Bitis arietans*

Matthew P Ameh [1], Mamman Mohammed [1], Yusuf P Ofemile [1], Magaji G Mohammed [2], Ada Gabriel [1], Akefe O Isaac [3]

Affiliations + expand

PMID: 31652115 DOI: 10.2174/1872208313666191025110019

https://pubmed.ncbi.nlm.nih.gov/31652115/

# NATURAL SOLUTIONS TO secretory Phospholipase a2 (sPLA2)

**Results:** At a concentration of 50 mg/ml, both plant extracts were found to neutralize the fibrinolytic activity of N. nigricollis, but 400 mg/ml was required to neutralize the fibrinolytic activity of B. arietans. In haemolytic studies, 50 mg/ml concentration of M. pruriens extract suppressed haemolysis caused by N. nigricollis venom by 70% but at the same concentration, M. pudica extract reduced haemolysis by 49.4%. M. pruriens, at 50 mg/ml concentration, only inhibited phospholipase A2 activity by 7.7% but higher concentrations up to 400mg/ml had no effect against the venom of N. nigricollis; at 200 mg/ml. M. pudica extract inhibited PLA2 activity by 23%.

**Conclusion:** The results suggest that M. pruriens and M. pudica may be considered as promising antivenom agents for people living in a snake-bite prone environment.

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> Agents Actions. 1990 Mar;29(3-4):364-73. doi: 10.1007/BF01966469.

## The coumarin derivative AD6 inhibits the release of arachidonic acid by interfering with phospholipase A2 activity in human platelets stimulated with thrombin

S Porcellati [1], V Costantini, M Prosdocimi, M Stasi, R Pistolesi, G G Nenci, G Goracci

Affiliations + expand

PMID: 2111085 DOI: 10.1007/BF01966469

https://pubmed.ncbi.nlm.nih.gov/2111085/

# NATURAL SOLUTIONS TO secretory Phospholipase a2 (sPLA2)

## Coumarin content in cinnamon – what's the deal?

October 27, 2020 by Donna

Some of my astute, concerned clients have asked me about the reported coumarin content in cinnamon, so I thought I'd set the record straight here.

Coumarin is a natural blood thinner from which the drug, Warfarin (generic: coumadin), is derived. Blood thinners are useful in preventing blood clots which prevent heart attacks and strokes, but too much of a good thing runs the risk of excess bleeding. What does this all have to do with cinnamon, you ask?

### Types of Cinnamon

https://greenhavenherbalist.com/coumarin-content-in-cinnamon-whats-the-deal/


# Supplement Facts

Serving Size: 1 ml
Servings Per Container: About 60

| | Amount Per Serving |
|---|---|
| Proprietary Blend | 1 ml* |

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*Daily Value (DV) not established

Other Ingredients: organic vegetable glycerin, triple-distilled biophotonic structured water, organic ice pressed olive oil, organic avocado oil

# NATURAL SOLUTIONS TO secretory Phospholipase a2 (sPLA2)

## Coumarin content in cinnamon

One of the more common types of cinnamon sold in the United States is cassia cinnamon (*C. cassia*), quite frankly because it's a lesser quality than what is known as Ceylon or "true" cinnamon (*C. verum*, where 'verum' is Latin for roughly 'true'). Unfortunately, cassia contains the highest amounts of coumarin of all the species. But before you rush to your spice cabinet and throw away all your cinnamon stash, read on because it's not as bad as it sounds...

According to the Natural Medicines database, the amount of coumarin in cassia cinnamon can be up to 1.2%, which translates to about 6-12mg in one teaspoon (2020). In 2010, Abraham, et al., determined that a tolerable daily intake (TDI) of coumarin was up to 0.05mg/lb of body weight. The TDI was based on the potential of liver toxicity and not the cardiovascular effects discussed above.

This amount translates to about 6.8mg for a 150 lb person – right at the lower end of the TDI. But remember, that's the amount in a whole teaspoon of cassia. How many of us are eating that much in one shot? Probably not too many – most of the culinary recipes I have contain 1 teaspoon for the whole recipe. So, fear not when you're enjoying your cinnamon raisin muffins or chai tea as you should be just fine for normal, culinary use.

https://greenhavenherbalist.com/coumarin-content-in-cinnamon-whats-the-deal/

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# NATURAL SOLUTIONS TO secretory Phospholipase a2 (sPLA2)

Toxicology Reports 1 (2014) 74–84

Contents lists available at ScienceDirect

Toxicology Reports

journal homepage: www.elsevier.com/locate/toxrep


## *In vivo* and *in vitro* toxicity of nanogold conjugated snake venom protein toxin GNP-NKCT1

Partha Pratim Saha[a], Tanmoy Bhowmik[a], Anjan Kumar Dasgupta[b], Antony Gomes[a,*]

[a] *Laboratory of Toxinology & Experimental Pharmacodynamics, Department of Physiology, University of Calcutta, 92 APC Road, Kolkata 700009, India*

[b] *Department of Biochemistry, University of Calcutta, 35 Ballygunge Circular Road, Kolkata 700019, India*

https://www.sciencedirect.com/science/article/pii/S2214750014000195

# NATURAL SOLUTIONS TO secretory Phospholipase a2 (sPLA2)


## Abstract

Research on nanoparticles has created interest among the biomedical scientists. Nanoparticle conjugation aims to target drug delivery, increase drug efficacy and imaging for better diagnosis. Toxicity profile of the nanoconjugated molecules has not been studied well. In this communication, the toxicity profile of snake venom cytotoxin (NKCT1), an antileukemic protein toxin, was evaluated after its conjugation with gold nanoparticle (GNP-NKCT1). Gold nanoparticle conjugation with NKCT1 was done with $NaBH_4$ reduction method. The conjugated product GNP-NKCT1 was found less toxic than NKCT1 on isolated rat lymphocyte, mice peritoneal macrophage, in culture, which was evident from the MTT/Trypan blue assay. Peritoneal mast cell degranulation was in the order of NKCT1 > GNP-NKCT1. The *in vitro* cardiotoxicity and neurotoxicity were increased in case of NKCT1 than GNP-NKCT1. On isolated kidney tissue, NKCT1 released significant amount of ALP and γ-GT than GNP-NKCT1. Gold nanoconjugation with NKCT1 also reduced the lethal activity in mice. *In vivo* acute/sub-chronic toxicity studies in mice showed significant increase in molecular markers due to NKCT1 treatment, which was reduced by gold nanoconjugation. Histopathology study showed decreased toxic effect of NKCT1 in kidney tissue after GNP conjugation. The present study confirmed that GNP conjugation significantly decreased the toxicity profile of NKCT1. Further studies are in progress to establish the molecular mechanism of GNP induced toxicity reduction.




https://www.sciencedirect.com/science/article/pii/S2214750014000195


# Supplement Facts

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# NATURAL SOLUTIONS TO secretory Phospholipase a2 (sPLA2)

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> J Pharmacol Exp Ther. 1997 Mar;280(3):1277-83.

## Nicotine-induced inhibition of neuronal phospholipase A2

P Marin [1], B Hamon, J Glowinski, J Premont

Affiliations + expand

PMID: 9067314

https://pubmed.ncbi.nlm.nih.gov/9067314/

# NATURAL SOLUTIONS TO secretory Phospholipase a2 (sPLA2)

## Abstract

A protective effect of nicotine against glutamate-induced neurotoxicity has previously been reported in cultured striatal and cortical neurons. The aim of this study was to investigate whether nicotine also inhibits glutamate-evoked arachidonic acid release from cultured striatal neurons. (-)-Nicotine selectively inhibited the release of [3H]-arachidonic acid induced by the joint stimulation of alpha-amino-3-isoxazol-5-propionic acid and metabotropic receptors, whereas the response evoked by the sole activation of N-methyl-D-aspartate receptors remained unchanged. The inhibitory effect of (-)-nicotine was not mediated by nicotinic receptors because it was neither reproduced by acetylcholine (in the presence of atropine) or 1,1-dimethyl-4-phenyl piperazinium, nor reversed by dihydro-beta-erythroidine or hexamethonium, two central nicotinic receptor antagonists. (-)-Nicotine, which induced rapidly desensitizing inward currents in 17% of striatal neurons, did not alter the alpha-amino-3-isoxazol-5-propionic acid-evoked currents. Moreover, (-)-nicotine did not inhibit the accumulation of inositol phosphate derivatives induced by agonists of glutamate metabotropic receptors. In fact, using the fluorogenic phospholipase A2 substrate 1,2-bis-(1-pyrenedecanoyl)-sn-glycero-3-phosphocholine, (-)-nicotine was found to inhibit both particulate and soluble phospholipase A2 activities from striatal neurons. Therefore, (-)-nicotine can modulate a neuronal response (arachidonic acid release) evoked by glutamate but this process is not involved in the neuroprotective effect of the drug on glutamate-induced neurotoxicity.

https://pubmed.ncbi.nlm.nih.gov/9067314/

# "Ask Your Doctor if 7mg NICOTINE PATCHES Are Right For You?"


# 2023 Nobel Prize In Medicine Goes To….?

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## Katalin Karikó and Drew Weissman, Penn's Historic mRNA Vaccine Research Team, Win 2023 Nobel Prize in Medicine

*Highest Honor Bestowed for Foundational Discoveries that Gave the World a Vaccine to Fight COVID-19 Pandemic*

October 02, 2023

PHILADELPHIA – The University of Pennsylvania messenger RNA pioneers whose years of scientific partnership unlocked understanding of how to modify mRNA to make it an effective therapeutic—enabling a platform used to rapidly develop lifesaving vaccines amid the global COVID-19 pandemic—have been named winners of the 2023 Nobel Prize in Physiology or Medicine. They become the 28th and 29th Nobel laureates affiliated with Penn, and join nine previous Nobel laureates with ties to the University of Pennsylvania who have won the Nobel Prize in Medicine.

Nearly three years after the rollout of mRNA vaccines across the world, **Katalin Karikó, PhD**, an adjunct professor of Neurosurgery in Penn's Perelman School of Medicine, and **Drew Weissman,**

*Photo Credit: Peggy Peterson Photography for Penn Medicine*

Contacts

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C: 267-693-2999
Francis.Otto@pennmedicine.upenn.edu

For Patients and the General Public: 1-800-789-7366

For Media Queries & Requests (24/7): 215-662-2560

https://www.pennmedicine.org/news/news-releases/2023/october/katalin-kariko-and-drew-weissman-win-2023-nobel-prize-in-medicine

# VENOMS IN THE COVID-19 shots
## Katalin Kariko & Drew Weissman

*Published online 3 August 2011* *Nucleic Acids Research, 2011, Vol. 39, No. 21* **9329–9338**
*doi:10.1093/nar/gkr586*

# Nucleoside modifications in RNA limit activation of 2′-5′-oligoadenylate synthetase and increase resistance to cleavage by RNase L

**Bart R. Anderson[1], Hiromi Muramatsu[2], Babal K. Jha[3], Robert H. Silverman[3], Drew Weissman[1] and Katalin Karikó[2,*]**

[1]Department of Medicine, 3610 Hamilton Walk, 522B Johnson Pavilion, University of Pennsylvania, Philadelphia, PA 19104, [2]Department of Neurosurgery, 371 Stemmler Hall, University of Pennsylvania, Philadelphia, PA 19104 and [3]Department of Cancer Biology NB40, Lerner Research Institute, Cleveland Clinic, 9500 Euclid Avenue, Cleveland, OH 44195, USA

Received April 17, 2011; Revised June 27, 2011; Accepted June 30, 2011

https://academic.oup.com/nar/article/39/21/9329/1093548?login=false

# EVIDENCE of VENOM IN THE COVID-19 Bio weapon shots

## Katalin Kariko & Drew Weissman


**FUNDING**

National Institutes of Health (R01AI50484 and R21DE019059 to D.W.; T32GM07229, T32DK07748 and T32RR007063 to B.R.A.; R01NS029331 and R42HL87688 to K.K.; R01CA044059 to R.H.S). Funding for open access charge: National Institutes of Health (grant R42HL87688 to K.K.).


*Conflict of interest statement*. K.K. and D.W. have formed a small biotech company RNARx that receives funding from the National Institutes of Health to explore the use of nucleoside-modified mRNA for gene therapy.



Caption https://academic.oup.com/nar/article/39/21/9329/1093548?login=false

# EVIDENCE of VENOM IN THE COVID-19 Bio weapon shots

## Katalin Kariko & Drew Weissman

The presence of Ψ has been shown to enhance the stability of RNA secondary structures, but has not previously been demonstrated to cause resistance to nucleases. RNA containing Ψ was cleaved efficiently by RNase A, RNase H (36), RNase T1, RNase T2, nuclease P1 and snake venom phosphodiesterase, although there is some indication that pancreatic diesterase and snake venom phosphodiesterase may cleave Ψ-RNA with reduced efficiency (37). A previous report based on cleavage of a $C_{11}N_2C_7$ oligo RNA showed that RNA containing 2′-deoxy-2′-α-fluorouridine was bound by RNase L but cleaved slowly, whereas RNA containing 2′-*O*-methyluridine was not bound by RNase L (38). Here, we used a similar approach and demonstrated that purified RNase L readily cleaved



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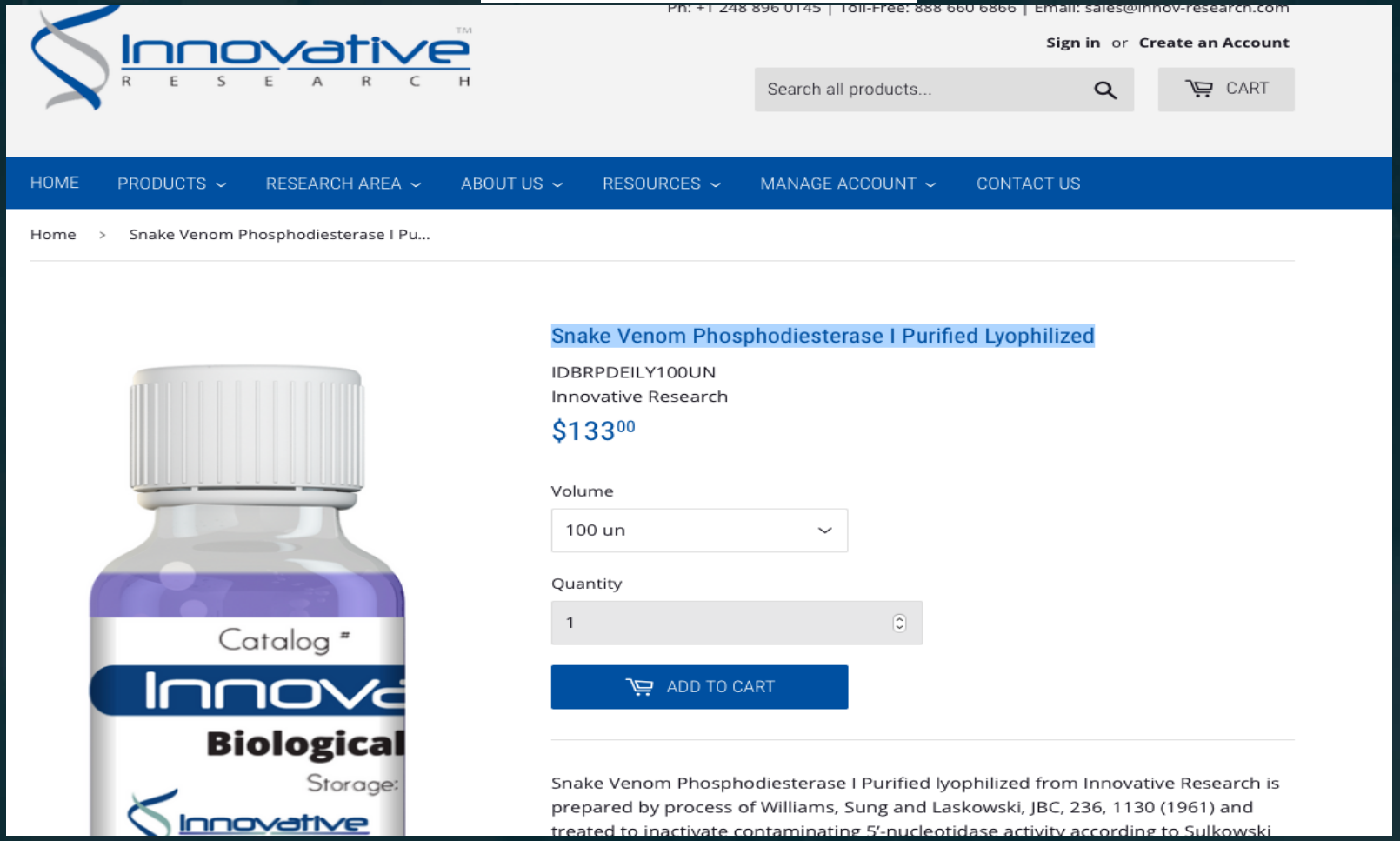
https://academic.oup.com/nar/article/39/21/9329/1093548?login=false

# SNAKE VENOM PHOSPHODIESTERASE IN THE COVID-19 Shots Katalin Kariko & Drew Weissman




https://www.innov-research.com/products/snake-venom-phosphodiesterase-i-purified-lyophilized

Caption

# SNAKE VENOM PHOSPHODIESTERASE IN THE COVID-19 Shots Katalin Kariko & Drew Weissman


Quantity

1

ADD TO CART

Snake Venom Phosphodiesterase I Purified lyophilized from Innovative Research is prepared by process of Williams, Sung and Laskowski, JBC, 236, 1130 (1961) and treated to inactivate contaminating 5′-nucleotidase activity according to Sulkowski and Laskowski, Biochim. Biophys. Acta, 240, 443 (1961). This is a lyophilized in vials with a concentration of 20 Units/mg dry weight.

This product is useful successively hydrolyzing 5′-mononucleotides from 3′-OH-terminated riboand deoxyribo-oligonucleotides. The enzyme has an optimal pH range of 9.8-10.4 and a molecular weight of 115 kDa. Phosphodiesterase is inhibited by reducing agents such as glutathione, The enzyme has an optimal pH range of 9.8-10.4 and a molecular weight of 115 kDa. It is inhibited by reducing agents such as glutathione, cysteine and ascorbic acids and completely inhibited by 5 mM EDTA. ATP, ADP and AMP are partial inhibitors. The enzyme has an absolute requirement for Mg2+.

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https://www.innov-research.com/products/snake-venom-phosphodiesterase-i-purified-lyophilized

# ANTIDOTES: SNAKE VENOM PHOSPHODIESTERASE

**EDTA:** Liquid EDTA 1ml Twice daily

**Glutathione:** 1000mg Per day

**Vitamin C:** 2000-5000mg Per Day, Split Up Through Out The Day

**N-Acetyl Cysteine:** 2000mg Daily

* If Received Vaccines May Consider Stopping **Magnesium** For 3 Months While Detoxing

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Caption

# RECALL; KATALIN KARIKO AND DREW WEISSMAN CLAIM TO USE “Rnases” and “Snake Venom Phosphodiesterase”

The presence of Ψ has been shown to enhance the stability of RNA secondary structures, but has not previously been demonstrated to cause resistance to nucleases. RNA containing Ψ was cleaved efficiently by RNase A, RNase H (36), RNase T1, RNase T2, nuclease P1 and snake venom phosphodiesterase, although there is some indication that pancreatic diesterase and snake venom phosphodiesterase may cleave Ψ-RNA with reduced efficiency (37). A previous report based on cleavage of a $C_{11}N_2C_7$ oligo RNA showed that RNA containing 2′-deoxy-2′-α-fluorouridine was bound by RNase L but cleaved slowly, whereas RNA containing 2′-*O*-methyluridine was not bound by RNase L (38). Here, we used a similar approach and demonstrated that purified RNase L readily cleaved



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# RECALL; KATALIN KARIKO AND DREW WEISSMAN CLAIM TO USE “Rnases” and “Snake Venom Phosphodiesterase”

BENTHAM SCIENCE

## Phosphodiesterases (PDEs) from Snake Venoms: Therapeutic Applications

Bushra Uzair[1], Barkat A. Khan[2,*], Noureen Sharif[1], Faiza Shabbir[1] and Farid Menaa[3]

*[1]Department of Biotechnology and Bioinformatics, Islamic International University, Islamabad, Pakistan; [2]Department of Pharmaceutics, Faculty of Pharmacy, Gomal University, D.I Khan, Pakistan; [3]Department of Pharmaceutical Sciences and Nanomedicine, Fluorotronics, San Diego, CA, USA*

**Abstract:** ***Background***: Snake venom, a highly poisonous and active venomous snake’s secretion, is a complex mixture of inorganic cations, carbohydrates, lipids, proteins, peptides, toxins and hydrolytic enzymes of importance including Phosphodiesterases (PDEs). These snake venom hydrolytic enzymes interfere in different physiological processes. Snake venom PDEs have several roles to metabolize extracellular nucleotides and to regulate nucleotide based intercellular signalling mechanisms including platelet aggregation, which can lead to death and debilitation in cardiac arrest and strokes in patients having cerebro-vascular and cardiovascular diseases, hypertension and atherosclerosis which is the primary cause of life-threatening diseases such as, stroke and myocardial-infarction.

ARTICLE HISTORY

Received: January 28, 2017
Revised: April 23, 2017
Accepted: March 12, 2018

https://www.eurekaselect.com/article/91345

# RECALL; KATALIN KARIKO AND DREW WEISSMAN CLAIM TO USE “Rnases” and “Snake Venom Phosphodiesterase”

## 1. INTRODUCTION

Phosphodiesterase (PDEs) are enzymes that are used to disrupt phosphodiester bonds. These are glycoproteins and are membrane bound. The hydrolysis of various nucleotide polyphosphates is catalysed by theses enzymes. Phosphodiesterase-I is used in phosphodiesterase activation assays to hydrolyze AMP.

Cocktails of purely dynamic gears of biology, snake venoms consist of carbohydrates, free amino acids, lipids, proteins, peptides, toxins and hydrolytic enzymes, proteins and peptides which are non-enzymatic, inorganic cation and organic components used for both the immobilization and digestion of prey [1].The most common enzymes in snake venoms are serine proteinases, Phospholipase A2s (PLA2s), acetylcholinesterases (AChEs), metalloproteinases, L-amino acid oxidases, hyaluronidases, phosphodiesterases, nucleotidases (5’-nucleotidases, ATPases and DNases) [2]. Phosphodiesterase, DNase, and RNase are those hydrolytic enzymes, which are universally present in all venoms of snakes, but their pharmacological activities were less characterized during early studies [3-5].

*Address correspondence to this author at the Department of Pharmaceutics, Faculty of Pharmacy, Gomal University, Dera Ismail Khan 29050, Khyber

### 1.1. Venomous Snakes Families

Until now, 600 species of these venomous snakes are known, one fourth of species of snakes are further classified into these families: Crotalidae, Colubridae, Hydrophidae, Atractaspididae, Viperidae [6].

### 1.2. Nucleases

Nucleases are that type of enzymes which act on nucleic acids comprising of DNA and RNA. The nucleases present in snake venom consist of exonucleases and endonucleases. Endonucleases are further classified in DNases and RNases, DNA is hydrolyzed by DNases, and RNA is hydrolyzed by RNases. On the other hand, Exonucleases consists of Phosphodiesterases (PDE), which has role in the hydrolysis of both DNA and RNA [7, 8].

### 1.3. Differentiation of Phosphodiesterases from Endonucleases

It is a difficult task to differentiate between the specific activity of venom endonuclease and PDE because endonucleolytic activity is snake venom PDE’s inherent property [9]. For the differentiation of PDE from endonucleases, other biochemical parameters are also needed along with substrate specificities. Venom proteins having an optimum acidic pH

https://www.eurekaselect.com/article/91345

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https://www.eurekaselect.com/article/91345

# RECALL; KATALIN KARIKO AND DREW WEISSMAN CLAIM TO USE “Rnases” and “Snake Venom Phosphodiesterase”

**Table 1. Properties of Phosphodiesterases Purified from different Snake Venoms.**

| Snake (PDE) | Substrate | MM kDa | Inhibitor | References |
|---|---|---|---|---|
| *B. atrox* | polyA, Bis-pNPP | 130 | EDTA | [16] |
| *B. alternates* | Bis-pNPP | 105 | --"-- | [29] |
| *Cerastes cerastes* | --"-- | 110 | EDTA, cysteine, | [50] |
| *Crotalus adamentus* | --"-- | 115, 140 | AMP, ADP | [8] |
| *Cr. mitchilli pyrrhus* | cAMP, ATP, ADP | 110 | EDTA | [22] |
| *Cr. rubber rubber* | Bis-pNPP | 98 | PCMB, EDTA | [7] |
| *Cr. viridis oreganus* | DNA/RNA, cAMP | 114 | EDTA | [24] |
| *Trimeresures flavo-viridis* | --"-- | 140 | --"-- | [25] |
| *T. mucrosquamatus* | DNA/RNA | ------ | EDTA, PCMB | [28] |
| *Bothrops jararaca* (Nn-PDEII) | ADP | 228 | dithiothreitol and EDTA | [47] |
| *Trimeresurus Stejnegeri (TS-PDE)* | ATP,NAD,ADP | 100 | ------- | [35] |
| *Daboia russelli russelli (DR-PDE)* | ADP | ------- | Metal chelators | [12] |
| *Vipera lebetina (VL-PDE)* | ADP | 120 | ------ | [31] |
| *Naja nigricollis* (Nn-PDEII) | - | 125 | EDTA | [40] |



https://www.eurekaselect.com/article/91345

# 2021: Italy Scientists Confirm 36 Animal Venoms ONLY in COVID-19 Positive Patients Bodies!

F1000Research F1000Research 2021, 10:550 Last updated: 20 JAN 2022

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RESEARCH ARTICLE

## REVISED Toxin-like peptides in plasma, urine and faecal samples from COVID-19 patients [version 2; peer review: 2 approved]

Carlo Brogna[1*], Simone Cristoni[2*], Mauro Petrillo[3*], Maddalena Querci[3], Ornella Piazza[4], Guy Van den Eede[5]

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| UNIPROTKB CANDIDATE'S INFORMATION | | | | | | | TAXONOMY CANDIDATE'S INFORMATION | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AC | ID | Status | Protein name | ENZYME EC | Other name(s) | Length (aa) | ID | Species | Phylum - Family | Organism's common name(s) |
| Q8AY46 | VKTHB_BUNCA | reviewed | Kunitz-type serine protease inhibitor homolog beta-bungarotoxin B1 chain | NA | - | 85 | 92438 | *Bungarus Candidus* | ***Chordata*** *- Elapidae* | . Malayan krait |
| A6MEY4 | PA2B_BUNFA | reviewed | Basic phospholipase A2 BFPA | EC 3.1.1.4 | . Antimicrobial phospholipase A2<br>. Phosphatidylcholine 2-acylhydrolase (svPLA2) | 145 | 8613 | *Bungarus fasciatus* | ***Chordata*** *- Elapidae* | . Banded krait<br>. Pseudoboa fasciata |
| F5CPF1 | PA235_MICAT | reviewed | Phospholipase A2 MALT0035C | EC 3.1.1.4 | . Phospholipase A2 MALT0035C (svPLA2) | 142 | 129457 | *Micrurus altirostris* | ***Chordata*** *- Elapidae* | . Uruguayan coral snake<br>. Elaps altirostris |
| A8QL59 | VM3_NAJAT | reviewed | Zinc metalloproteinase-disintegrin-like NaMP | EC 3.4.24.- | . Snake venom metalloproteinase (SVMP) | 621 | 8656 | *Naja atra* | ***Chordata*** *- Elapidae* | . Chinese cobra |
| Q9I900 | PA2AD_NAJSP | reviewed | Acidic phospholipase A2 D | EC 3.1.1.4 | . svPLA2<br>. APLA<br>. Phosphatidylcholine 2-acylhydrolase | 146 | 33626 | *Naja sputatrix* | ***Chordata*** *- Elapidae* | . Malayan spitting cobra<br>. Naja naja sputatrix |
| Q58L90 | FA5V_OXYMI | reviewed | Venom prothrombin activator omicarin-C non-catalytic subunit | NA | . vPA<br>. Venom coagulation factor Va-like protein<br>*Cleaved into 2 chains* | 1460 | 111177 | *Oxyuranus microlepidotus* | ***Chordata*** *- Elapidae* | . Inland taipan<br>. Diemenia microlepidota |
| Q58L91 | FA5V_OXYSU | reviewed | Venom prothrombin activator oscutarin-C non-catalytic subunit | NA | . vPA<br>. Venom coagulation factor Va-like protein<br>*Cleaved into 2 chains* | 1459 | 8668 | *Oxyuranus scutellatus* | ***Chordata*** *- Elapidae* | . Coastal taipan |
| Q9W7J9 | 3S34_PSETE | reviewed | Short neurotoxin 4 | NA | . SNTX4<br>. Alpha-neurotoxin 4 | 79 | 8673 | *Pseudonaja textilis* | ***Chordata*** *- Elapidae* | . Eastern brown snake |
| P23028 | PA2AD_PSETE | reviewed | Acidic phospholipase A2 homolog textilotoxin D chain | NA | . svPLA2 homolog | 152 | 8673 | *Pseudonaja textilis* | ***Chordata*** *- Elapidae* | . Eastern brown snake |

Caption

| UNIPROTKB CANDIDATE'S INFORMATION | | | | | | | TAXONOMY CANDIDATE'S INFORMATION | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AC | ID | Status | Protein name | ENZYME EC | Other name(s) | Length (aa) | ID | Species | Phylum - Family | Organism's common name(s) |
| Q7SZN0 | FASV_PSETE | reviewed | Venom prothrombin activator pseutarin-C non-catalytic subunit | NA | . PCNS<br>. vPA<br>. Venom coagulation factor Va-like protein<br>*Cleaved into 2 chains* | 1460 | 8673 | *Pseudonaja textilis* | **Chordata** - *Elapidae* | . Eastern brown snake |
| Q2XXQ3 | CRVP1_PSEPL | reviewed | Cysteine-rich venom protein ENH1 | NA | . CRVP<br>. Cysteine-rich secretory protein ENH1 (CRISP-ENH1) | 239 | 338839 | *Pseudoferania polylepis* | **Chordata** - *Homalopsidae* | . Macleay's water snake<br>. Enhydris polylepis |
| Q9PW56 | BNP2_BOTJA | reviewed | Bradykinin-potentiating and C-type natriuretic peptides | NA | . Brain BPP-CNP<br>. Evasin-CNP<br>*Cleaved into the 12 chains* | 265 | 8724 | *Bothrops jararaca* | **Chordata** - *Viperidae* | . Jararaca |
| A8YPR6 | SVMI_ECHOC | reviewed | Snake venom metalloprotease inhibitor | NA | . 02D01<br>. 02E11<br>. 10F07<br>. Svmpi-Eoc7<br>*Cleaved into 15 chains* | 308 | 99586 | *Echis ocellatus* | **Chordata** - *Viperidae* | . Ocellated saw-scaled viper |
| Q698K8 | VM2L4_GLOBR | reviewed | Zinc metalloproteinase/ disintegrin [Fragment] | EC 3.4.24- | *Cleaved into 3 chains* | 319 | 259325 | *Gloydius brevicaudus* | **Chordata** - *Viperidae* | . Korean slamosa snake<br>. Agkistrodon halys brevicaudus |
| Q8AWI5 | VM3HA_GLOHA | reviewed | Zinc metalloproteinase-disintegrin-like halysase | EC 3.4.24- | . Zinc metalloproteinase-disintegrin-like halysase<br>. Snake venom metalloproteinase (SVMP)<br>. Vascular apoptosis-inducing protein (VAP) | 610 | 8714 | *Gloydius halys* | **Chordata** - *Viperidae* | . Chinese water mocassin<br>. Agkistrodon halys |
| P82662 | 3L26_OPHHA | reviewed | Alpha-neurotoxin | NA | . Alpha-elapitoxin-Oh2b (Alpha-EPTX-Oh2b)<br>. Alpha-elapitoxin-Oh2b<br>. LNTX3<br>. Long neurotoxin OH-6A/OH-6B<br>. OH-3 | 91 | 8665 | *Ophiophagus hannah* | **Chordata** - *Viperidae* | . King cobra<br>. Naja hannah |

Caption

# EDTA

toxins

MDPI

*Review*

## Natural Inhibitors of Snake Venom Metalloendopeptidases: History and Current Challenges

**Viviane A. Bastos [1,2], Francisco Gomes-Neto [1,2], Jonas Perales [1,2], Ana Gisele C. Neves-Ferreira [1,2] and Richard H. Valente [1,2,*]**

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# EDTA

*2.1. Snake Venom Metalloendopeptidases (Metalloproteinases)*

In the early days of experimental research on the effects of viperid envenomation, hemorrhage was recognized as one of its main clinical features [30]. At that time, the mechanism of hemorrhage was largely unknown, and some authors referred to the principle in snake venom that caused hemorrhage as "hemorrhagin" [31].

In 1960, Japanese investigators were able to purify peptidases from *Trimeresurus (Protobothrops) flavoviridis* venom that displayed hemorrhagic activity. Their functional assays showed that both the proteolytic and hemorrhagic activities of these proteins were eliminated following EDTA addition, indicating that these molecules were most likely metallopeptidases [32–35]. The atomic absorption spectroscopy experiments conducted by Bjarnason and Tu in 1978 confirmed this hypothesis, demonstrating that hemorrhagins are zinc-dependent metallopeptidases, containing 1 mol of zinc ion per mol of enzyme [36].

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# EDTA and Snake Venom Hemorrhagic Toxin



## Hemorrhagic Toxins from Western Diamondback Rattlesnake (*Crotalus atrox*) Venom: Isolation and Characterization of Five Toxins and the Role of Zinc in Hemorrhagic Toxin e†

Jon B. Bjarnason‡ and Anthony T. Tu*

ABSTRACT: Five previously unknown hemorrhagic proteins, designated hemorrhagic toxins a, b, c, d, and e, were isolated from the venom of the western diamondback rattlesnake (*Crotalus atrox*). Molecular weights of hemorrhagic toxins a–e were determined to be 68 000, 24 000, 24 000, 24 000, and 25 700, respectively, by sodium dodecyl sulfate–phosphate gel electrophoresis using various polyacrylamide gel concentrations. Amino acid composition showed a total of 636, 200, 213, 214, and 219 amino acids for hemorrhagic toxins a–e, respectively. All the hemorrhagic toxins were found to lose their hemorrhagic activities with the metal chelators ethylenediaminetetraacetic acid and 1,10-phenanthroline. All the hemorrhagic toxins were found to contain approximately 1 mol of zinc/mol of toxin, and they were all demonstrated to be proteolytic when dimethylcasein and dimethylhemoglobin were used as substrates. When zinc was removed from hemorrhagic toxin e with 1,10-phenanthroline, both the proteolytic and hemorrhagic activities were equally inhibited. When the apohemorrhagic toxin e thus produced was incubated with zinc, the hemorrhagic and proteolytic activities were regenerated to the same extent. CD, UV, and Raman spectroscopy were used to study the structure of native hemorrhagic toxin e as well as the structural changes caused by zinc removal. From CD spectroscopy the native toxin was estimated to consist of 23% $\alpha$ helix, 6% $\beta$ structure, and 71% random-coil conformation. When over 90% of the zinc was removed, the $\alpha$-helix content dropped from 23 to 7%.

https://pubs.acs.org/doi/abs/10.1021/bi00609a033

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# EDTA & COVID-19

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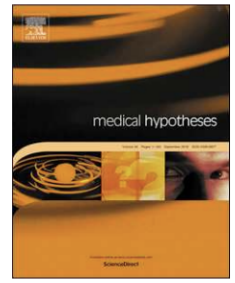


## Why the lower reported prevalence of asthma in patients diagnosed with COVID-19 validates repurposing EDTA solutions to prevent and manage treat COVID-19 disease

Daniel P. Cashman

*Unaffiliated, PO Box 841, Los Altos, CA, United States*

ABSTRACT

https://www.sciencedirect.com/science/article/pii/S0306987720312007

# EDTA & COVID-19


ABSTRACT

There currently is no specific antiviral drug or a vaccine for SARS-CoV-2/COVID-19 infections; now exceeding 10,300,000 infections worldwide. In the absence of animal models to test drugs, we need to find molecular explanations for any unforeseen peculiarities in clinical data, especially the recent reports describing an unexpected asthma paradox. Asthma is considered a high medical risk factor for susceptibility to SARS-CoV-2/COVID-19 infection, yet asthma is not on the list of top 10 chronic health problems suffered by people who died from SARS-CoV-2/COVID-19. Resolving this paradox requires looking beyond the binary model of a viral receptor-binding domain (RBD) attaching to the ACE-2 receptor. A NCBI pBlast analysis revealed that the SARS-CoV-2 surface spike protein contains key two calcium-dependent fusion domains that are almost identical to those that were recently discovered SARS-CoV-1. These viral calcium-dependent binding domains can facilitate membrane fusion only after cleavage by the host surface protease TMPRSS2. Importantly, TMPRSS2 also requires calcium for its SRCR (scavenger receptor cysteine-rich) domain and its LDLRA (LDL receptor class A) domain. Thus, the presence of EDTA excipients in nebulized $\beta_2$-agonist medicines can disrupt SARS-CoV-2/COVID-19 infection and can explain the asthma paradox. This model validates repurposing EDTA in nebulizer solutions from a passive excipient to an active drug for treating COVID-19 infections. Repurposed EDTA delivery to respiratory tissues at an initial target dose of 2.4 mg per aerosol treatment is readily achievable with standard nebulizer and mechanical ventilator equipment. EDTA warrants further investigation as a potential treatment for SARS-CoV-2/COVID-19 in consideration of the new calcium requirements for virus infection and the regular presence of EDTA excipients in common asthma medications such as Metaproterenol. Finally, the natural history of Coronavirus diseases and further analysis of the fusion loop homologies between the Betacorona SARS-CoV-2 virus and the less pathogenic Alphacorona HC0V-229E virus suggest how to engineer a hybrid virus suitable for an attenuated alpha-beta SARS-CoV-2/COVID-19 vaccine. Thus, replacing SARS-CoV-2 fusion loops (amino acids 816–855) with the less pathogenic HCoV-229E fusion loop (amino acids 923–982) may provide antigenicity of COVID-19, but limit the pathogenicity to the level of HCoV-229E.


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# EDTA & COVID-19


ABSTRACT

There currently is no specific antiviral drug or a vaccine for SARS-CoV-2/COVID-19 infections; now exceeding 10,300,000 infections worldwide. In the absence of animal models to test drugs, we need to find molecular explanations for any unforeseen peculiarities in clinical data, especially the recent reports describing an unexpected asthma paradox. Asthma is considered a high medical risk factor for susceptibility to SARS-CoV-2/COVID-19 infection, yet asthma is not on the list of top 10 chronic health problems suffered by people who died from SARS-CoV-2/COVID-19. Resolving this paradox requires looking beyond the binary model of a viral receptor-binding domain (RBD) attaching to the ACE-2 receptor. A NCBI pBlast analysis revealed that the SARS-CoV-2 surface spike protein contains key two calcium-dependent fusion domains that are almost identical to those that were recently discovered SARS-CoV-1. These viral calcium-dependent binding domains can facilitate membrane fusion only after cleavage by the host surface protease TMPRSS2. Importantly, TMPRSS2 also requires calcium for its SRCR (scavenger receptor cysteine-rich) domain and its LDLRA (LDL receptor class A) domain. Thus, the presence of EDTA excipients in nebulized $\beta_2$-agonist medicines can disrupt SARS-CoV-2/COVID-19 infection and can explain the asthma paradox. This model validates repurposing EDTA in nebulizer solutions from a passive excipient to an active drug for treating COVID-19 infections. Repurposed EDTA delivery to respiratory tissues at an initial target dose of 2.4 mg per aerosol treatment is readily achievable with standard nebulizer and mechanical ventilator equipment. EDTA warrants further investigation as a potential treatment for SARS-CoV-2/COVID-19 in consideration of the new calcium requirements for virus infection and the regular presence of EDTA excipients in common asthma medications such as Metaproterenol. Finally, the natural history of Coronavirus diseases and further analysis of the fusion loop homologies between the Betacorona SARS-CoV-2 virus and the less pathogenic Alphacorona HC0V-229E virus suggest how to engineer a hybrid virus suitable for an attenuated alpha-beta SARS-CoV-2/COVID-19 vaccine. Thus, replacing SARS-CoV-2 fusion loops (amino acids 816–855) with the less pathogenic HCoV-229E fusion loop (amino acids 923–982) may provide antigenicity of COVID-19, but limit the pathogenicity to the level of HCoV-229E.


https://www.sciencedirect.com/science/article/pii/S0306987720312007

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ABSTRACT

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*D.P. Cashman*

fusion loop peptides present within the S2 subunit discussed below. In SARS-CoV-2/COVID-19 the type II transmembrane serine protease (TTSP) TMPRSS2 cleaves the S1–S2 subunits [13]. It is also noteworthy that TMPRSS2 has two calcium-binding domains; a SRCR (scavenger receptor cysteine-rich) domain (aa 149–242) and a LDLRA (LDL receptor class A) domain (aa 113–148) that forms a binding site for calcium [14]. The SRCR is a conserved calcium-dependent domain in which binding was disrupted by EDTA [15]. Together, the LDLRA and SRCR-like domains that may serve as substrate recognition sites.

*Calcium-dependent fusion process required for viral infection*

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# EDTA & COVID-19

When the S1/S2 site and S2′ are activated by host proteases (e.g., TMPRSS2) there are changes in the cleavage site position relative to the fusion peptide to modulate the fusion loop (FL). This process gives CoVs the unique flexibility to invade different cell types and host species. Additionally, the CoVs fusion process employs a calcium-dependent fusion process that was only recently discovered for Rubella [16] and later described for SARS-CoV-1 infection [17]. While two fusion peptides (FLs) were found with SARS-CoV-1, influenza had no calcium-dependent membrane fusion process. The calcium dependent membrane-ordering results in more effective binding that can penetrate deeper into membranes. There are two FL domains in each SARS-CoV versus a single FL domain found in for HCoV-229E and Rubella shown in Table 2 below. Thus, this calcium-dependent requirement for the FL process may explain both the increased lethality of the beta CoVs and the apparent resistance of asthma patients to SARS-CoV-2 infection due to inhaling medications containing EDTA excipients.

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# EDTA & COVID-19

*The safety of EDTA in bronchial dilator solutions*

Ethylene Diamine Tetraacetic acid (EDTA) was first synthesized in1935 and EDTA has been employed as an excipient in bronchial dilator solutions for decades (e.g., Albuterol, Metaproterenol). EDTA has been added to nebulized bronchodilator solutions in the United States as both nonsterile and sterile-filled products [22]. Accordingly, Edetate disodium (Na2EDTA) is often present as preservative or stabilizing agents in nebulizer solutions used to treat asthma and chronic obstructive pulmonary disease [23]. Historically, common nebulizer therapies used by asthma and COPD patients have had concentrations of EDTA available in nebulizer solutions that vary from 0.1 to 0.5 mg/mL [24]. For example, Albuterol (manufactured by Dey Laboratories) contained 300 µg of EDTA, which is also far below the threshold dose for bronchoconstriction. Currently, Metaproterenol Inhalation Solution USP is expressly formulated with EDTA (edetate disodium) as a unit-dose bronchodilator to be administered by oral inhalation with the aid of an intermittent positive pressure breathing apparatus (IPPB). It contains 0.4% or 0.6% Metaproterenol sulfate in a sterile, acidic, aqueous solution containing edetate disodium, sodium chloride, hydrochloric acid, and/or sodium hydroxide for pH adjustment [25].

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# EDTA & COVID-19

Na2EDTA-induced bronchoconstriction in canines [28]. Additionally, intravenous EDTA chelation therapy has been safely used for more than 50 years [29]. There were an estimated 500,000 visits for chelation therapy in the U.S. for 1993 [30], and 800,000 in 1997 [31]. A Canadian survey found that 8% of patients who had undergone cardiac catheterization had used chelation therapy [32].

https://www.sciencedirect.com/science/article/pii/S0306987720312007

# Guess What Else Is Calcium-Dependent

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## The Role of Calcium on the Active Site of Snake Venom Phospholipase A2: Molecular Dynamics Simulations

**Akubugwo Emmanuel I.[1], Okafor Irene N.[2], Ezebuo Fortunatus C.[2, *], Lukong Colin B.[2], Ifemeje Jonathan C.[2], Nwaka Andrew C.[2], Chilaka Ferdinand C.[3]**

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http://www.sciencepublishinggroup.com/j/cb

# EDTA: Health Benefits

EDTA **removes the effects of a heart attack**.

EDTA removes or **reduces angina pectoris—chest pains**.

EDTA **reduces shortness of breath** in coronary artery disease.

EDTA can bring back the elderly from senility and improve memory and reduce the incidence of **Alzheimer's disease** and Pick's Atrophy.

EDTA **reduces blood pressure** in about 60% of high blood pressure patients.

EDTA can eliminate intermittent claudication (**leg cramps and leg pain and numbness due to poor circulation**).

EDTA can **reverse diabetic gangrene**. It can **restore impaired vision**, particularly in the diabetic whose suffering from macular degeneration.

EDTA **improves memory**, can **prevent the deposition of cholesterol in the liver, it reduces blood cholesterol levels**.

# EDTA: Health Benefits

EDTA can convert and **normalize 50% of irregular heart rhythms**. Chelation reduces or relaxes excessive heart contraction. It reduces heart irritability and increases potassium within the cells of your body.

EDTA **removes lead and cadmium and other heavy metals** from the body.

EDTA **removes calcium from arteriosclerotic pla**que. It **dissolves kidney stones, reduces serum iron and protects against iron poisoning** and iron storage disease of the liver.

EDTA **reduces heart valve calcification, improves heart function**.

EDTA **reduces dark pigmentation associated with varicose veins**.

EDTA heals calcified necrotic ulcers and **improve the vision in diabetic retinopathy**. It **dissolves small cataracts**. It makes arterial walls more flexible.

EDTA helps to **prevent and reduce osteoarthritis**. It **reduces and alleviates the symptoms of rheumatoid arthritis.**

EDTA helps to **smooth skin wrinkles, lowers insulin requirements for diabetics**.

# EDTA: Health Benefits

EDTA even **dissolves large and small clots or thrombi**.
EDTA can **reduce or reverse the effect of a stroke, particularly after the stroke, but even as late as two years following a stroke**. It **reduces the need for bypass surgical procedures**.
EDTA can **greatly reduce the need for lower extremity amputations**.

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## Ask Your Doctor if EDTA is Right For You?

# EDTA


NEW & IMPROVED

edta (liquid)

## Supplement Facts

Serving Size: 1 ml  Servings Per Container: About 60

| Amount Per Serving | | % Daily Value |
|---|---|---|
| Calcium EDTA | 225mg | † |

†Daily Value (DV) not established.

**OTHER INGREDIENTS:** Organic Vegetable Gylcerin, Triple-Distilled Biophotonic Structured Water, Organic Extra Virgin Cold Pressed Olive Oil, Organic Extra Virgin Cold Pressed Avocado Oil, Ormus Supercharged Minerals.

National Human Genome Research Institute

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## Are FDA-approved mRNA vaccines safe and effective?

Yes. The FDA approval process involves careful review of clinical trial data to independently confirm that a vaccine is safe and effective. Two mRNA vaccines have been tested in large-scale clinical trials that included elderly and medically at-risk individuals; 30% of participants in these trials were from racially and ethnically diverse backgrounds. Both vaccines have reported to result in a range of minor side effects, such as flu-like symptoms, that resolve within one or two days. mRNA vaccines do not contain the SARS-CoV-2 virus, so you cannot get COVID-19 from an mRNA vaccine.

https://www.genome.gov/about-genomics/fact-sheets/Understanding-COVID-19-mRNA-Vaccines

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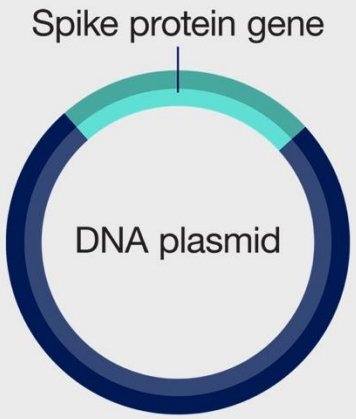


The target spike protein gene is then synthetically manufactured and inserted into in a plasmid, or a small, circular piece of DNA. Plasmids are used in mRNA vaccine production because they are easy to replicate (copy) and reliably contain the target gene sequence. Once a sequence is selected, a new plasmid can be produced within a couple of weeks, allowing new mRNA vaccines to be tested and distributed rapidly.

https://www.genome.gov/about-genomics/fact-sheets/COVID-19-mRNA-Vaccine-Production


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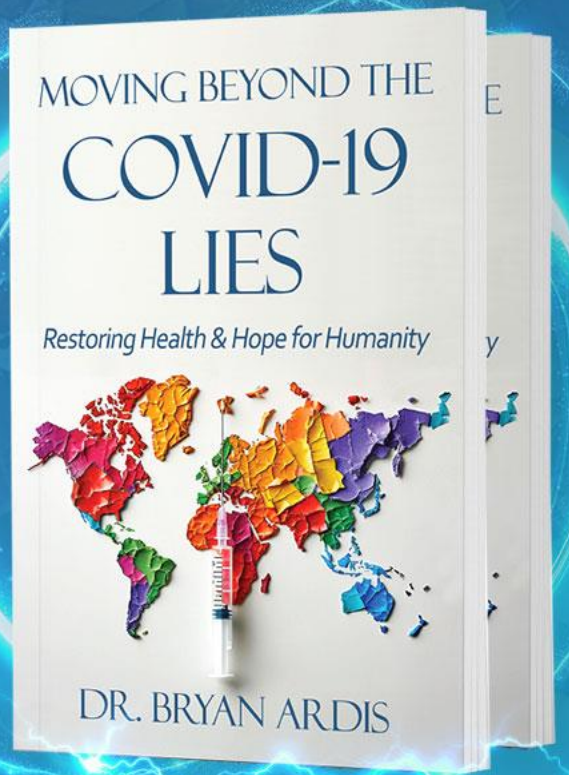


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