



THE POWER OF SYNTHETICS

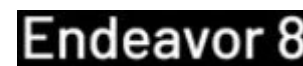
The Safety & Sustainability of Biologicals

VESTARON[®]

[Vestaron - All About SpearRC Alt Logo Bug \(vimeo.com\)](#)

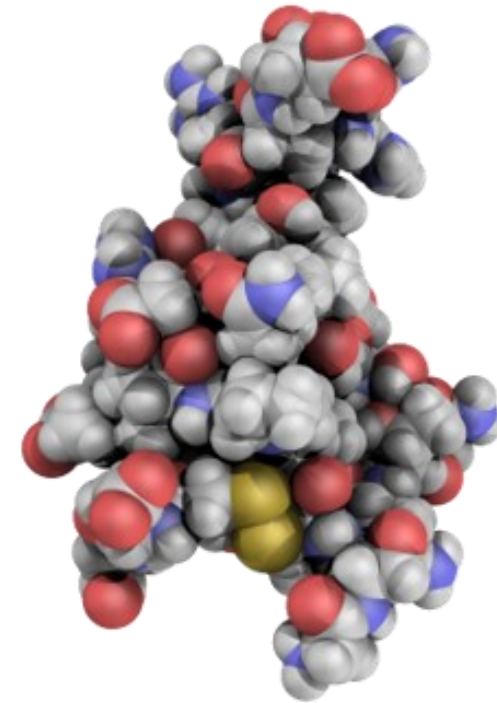
Corporate Profile

- 100+ Employees
- Incorporated in 2005
- Headquarters located in RTP, NC
- Research site located in Kalamazoo, MI
- Backed by leading AgTech and Life Science investors



Peptides - What are they?

- Peptides are very **small proteins**.
- They are short, linear sequences of amino acids, one of the main building blocks of life.
- Peptides are present in all living organisms.
- Vestaron's SPEAR[®] insecticide has a specific amino acid sequence and shape giving it unique insecticidal properties.
- Peptides break down into amino acids.



SPEAR contains the peptide:
Omega/Kappa Peptide
MW 4,571
Inhibitory Cystine Knot (ICK) Peptide



Vestaron's Peptide Revolution is Needed



Synthetic chemical pesticides may provide good efficacy, but can also have downsides:

- Environmental damage
- Harm to beneficial insects
- Safety issues for consumers and field labor



Growing difficulties in commercializing new chemical active ingredients:

- Rising development costs
- Late-stage failures
- Increasing regulatory hurdles









Existing solutions are facing resistance challenges resulting in fewer insect control solutions for growers:

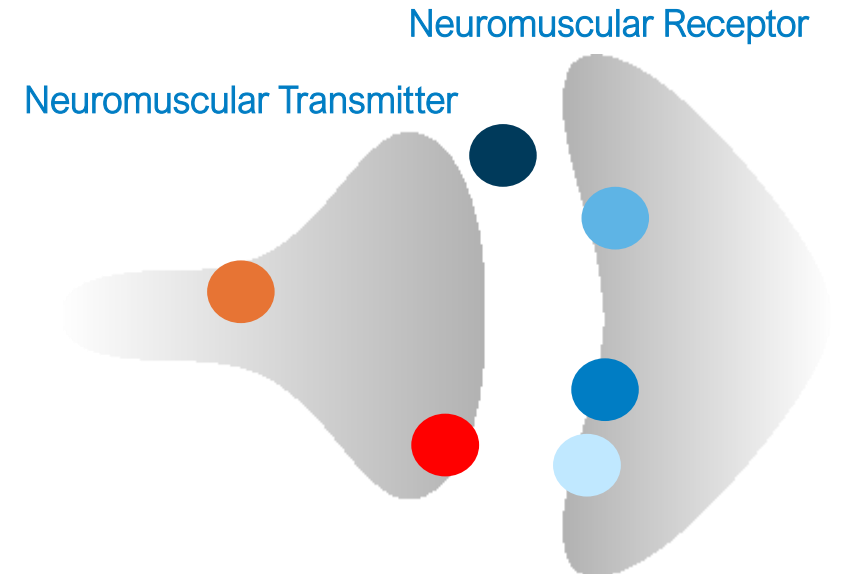
- Vestaron is overcoming these challenges with new revolutionary peptide-based insecticide solutions

Vestaron's Peptide Focus

Focused on the 6 most frequently targeted neuromuscular receptors in insects

<u>Receptor Type</u>	<u>Insecticide Target Site</u>	<u>Vestaron Presence</u>
Nicotinic Acetylcholine Receptor	Neonicotinoids, Spinosyns	 
Acetyl Cholinesterase	Carbamates, Organophosphates	
Voltage Gated Sodium Channel	Pyrethroids, DDT, Oxadiazines	 
Ryanodine Receptor	Diamides	
Glutamate Gated Receptor	Avermectins, Milbemycins	
Gaba Gated Receptor	Cyclodienes, Fiproles	

Vestaron can “reset” all the known neuromuscular targets that have developed resistance to existing synthetic chemistries.



- SPEAR® Attributes (target site specificity):
- New IRAC Group 32
 - Unique binding site
 - SPEAR controls insects that are resistant to Diamides, Spinosyns, and Neonicotinoids

A Compelling Grower Value Position

Drivers of Initial Adoption

- First novel broad-spectrum nerve and muscular mode of action in 15 years.
- Efficacy proven through >500 replicated trials to be on par with chemical pesticides.
- Price parity with leading traditional chemical pesticides.
- Drop-in for existing farming practices and flexible across cropping systems.

Incremental Utility with Continued Use

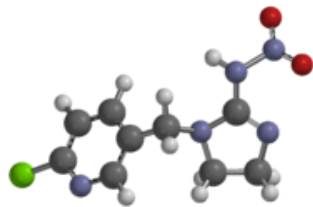
- Can be sprayed while pollinators are in the field.
- 4-hour worker re-entry interval (the shortest EPA allows).
- 0-day pre-harvest interval (compared to 7-10+ days for traditional chemical pesticides).
- No regulated residues.

Overall ROI

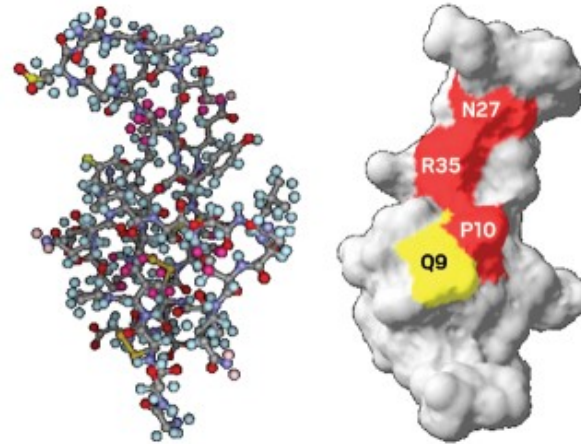
- Zero incremental spend.
- Reduced labor and operational costs.
- Reduced risk of resistance-related losses.
- Ability to make sustainability, safety and health claims.

Bioavailability

- Bioavailability refers to an active ingredient's ability to reach the target site and thereby neutralize the pest.
- SPEAR[®], like all proteins, has difficulty surviving the pest's stomach after ingestion so needs a little help.
- Bt in low doses allows SPEAR to escape the stomach and reach the target site.



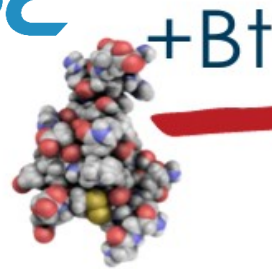
Imidacloprid
Molecular weight = 256 g/mol



GS-omega/kappa-Hctx-Hv1a
Molecular weight = 4565 g/mol

Route of Entry Through Ingestion

SPEAR[®] LEP
SPEAR[®] RC



① The SPEAR peptide is too large to cross the insect gut alone.

③ The perforations give SPEAR a path to the target site.

② A low rate of a Bt causes perforations in the insect gut.

④ Once inside, SPEAR reaches the target site and kills the insect.

Bt improves the bioavailability of SPEAR LEP and SPEAR RC to the neuromuscular target site, improving efficacy compared to either Bt or SPEAR LEP and SPEAR RC when ingested alone.

Target	Lepidopteran pests
Rate	2 pt/A, with lowest labeled rate of Bt
Surfactant	Use with a NIS or spreader/sticker at 0.125% v/v
PHI	0-Day
REI	4-Hour
MRL	Exempt
IRAC Group	New MOA IRAC Group 32
Category	Insecticide
Registered Crops	Corn, cotton, peanuts, soybeans, rice, cereal grains, vegetable fruiting, grass, & non-grass animal

- Nutrien: LI 700[®]
- Simplot: Aviator[™]/Valkarie[™]
- Helena: Penetrator Plus/Dyne-Amic
- GreenPoint Ag: MasterLock[®]

- Packaging Specifics:**
- Package size of SPEAR RC is 2.5 gallon
 - Case configuration = 2X2.5 gallon
 - Needs Bt (ingestion only)

LEPROTEC[®]

Liquid Btk
Bacillus thuringiensis ssp. kurstaki strain EVB-113-19



Effective

- Provides control equivalent to DiPel for lepidopteran pests on the organic and conventional acre.
- Partner on SPEAR[®] LEP and SPEAR RC acre
- Liquid Btk strain EVB-113-19



Cost Competitive

- Conversion rate:
LEPROTEC 1.5 pt =
1 lb. DiPel



Sustainable

- Soft on beneficials
- Produced via fermentation system



Packaging Specifics:

- Package size of LEPROTEC (Btk) 4X1 gallon case (use with SPEAR LEP or SPEAR RC)
- Ease of using liquid vs. powder

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QUESTIONS?