HUTOX

Clostridium botulinum
Toxin Type A

Huons

HUTOX Summary

Main Ingredient
Clostridium Botulinum Toxin Type A

Dosage Form
Freeze-dried white powder for reconstitution with sterile, 0.9% sodium chloride solution with preservative-free

Indication
Temporary improvement in the appearance of moderate to severe glabellar lines associated with corrugator and/or procerus muscle activity in adult patients aged 19 – 65 years old

Dosage & Administration (Glabellar Lines)
Reconstitute this product with preservative-free, sterile saline to make 100U/2.5mL (4U/0.1mL) and using a 30-gauge needle, inject a dose of 0.1mL into each of 5 sites, 2 in each corrugators muscle and 1 in procerus muscle, for a total of 20U

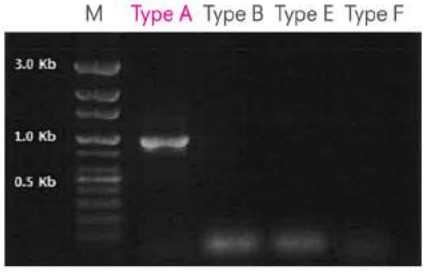
Strength
Clostridium Botulinum Toxin Type A 100 Units / 200 Units

HUTOX Identification

The strain was confirmed as Type A by PCR
Also, Botulinum Toxin protein showed same pattern with standard on SDS-PAGE

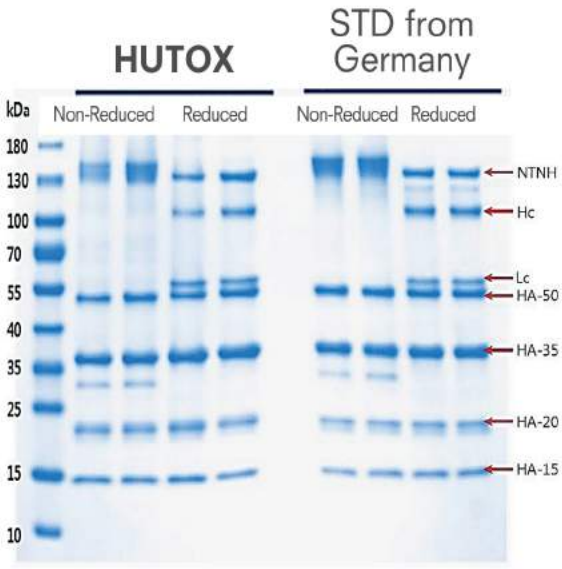
Clostridium botulinum Type A

Gram positive, Rod-shaped



Serotyping result : Type A (PCR)

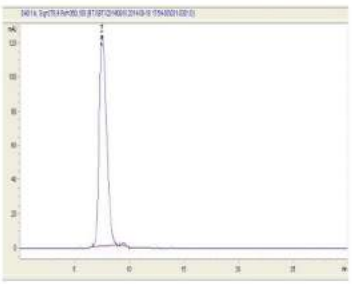
Botulinum Toxin Type A



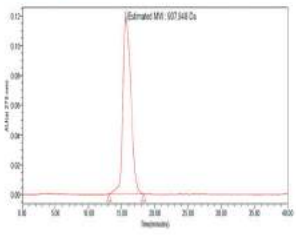
HUTOX Protein Size Comparison

The molecular weight of HUTOX protein has similar value compared with company A and B

HUTOX - 903.3 ± 4 kDa

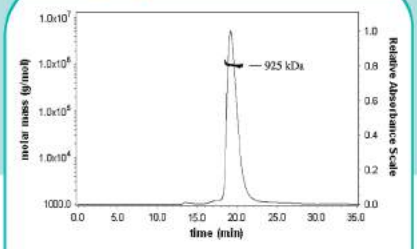


Company "A" - 907.9 ± 7 kDa



Ref) GI-HYEOK YANG, PHD, AND HYUN HO JUNG, PHD* A New Botulinum Toxin Potentially Bioequivalent to OnabotulinumtoxinA: Are There Any Differences at All? Dermatol Surg 2013;39:165–170

Company "B" - 925 ± 45 kDa

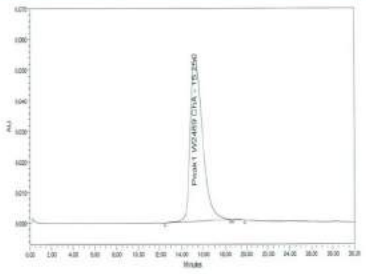


Ref) Lietzow MA, Gielow ET, Le D, Zhang J, et al. Subunit stoichiometry of the Clostridium botulinum type A neurotoxin complex determined using denaturing capillary electrophoresis. Protein J 2008;27(7–8):420–5.

HUTOX Purity Comparison

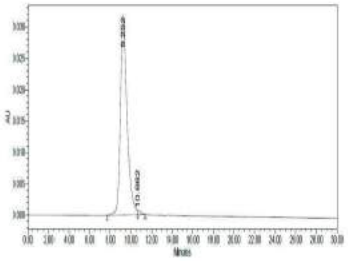
HUTOX has higher purity compared to other company's product

HUTOX – 99.8%



	Peak Name	RT	Area	% Area	Height
1	Peak 1 W2489 ChA	15.250	4152357	99.81	53621
2	Peak 2 W2489 ChA	19.200	8004	0.19	209

Company "A" Purity – 98.99%



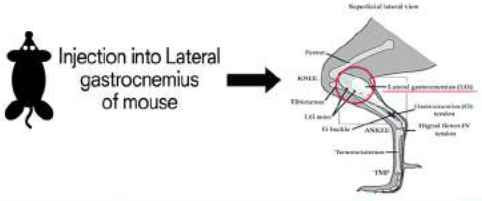
	Retention Time (min)	Area (μV*sec)	% Area
1	9.252	1489506	98.99
2	10.662	15157	1.01

Ref) KP 10 - 1339349

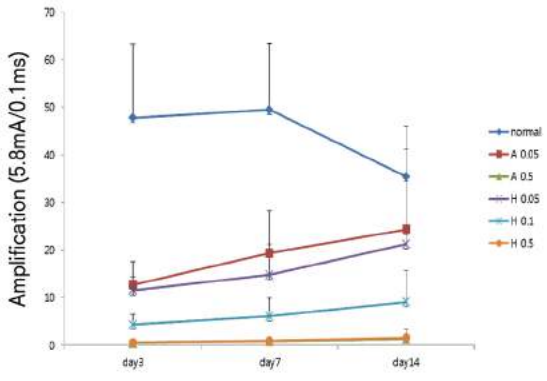
HUTOX Efficacy Comparison

HUTOX showed equivalent efficacy compared to original company A

Electromyography(EMG) in mouse



	HUTOX	Company "A"
Stock concentration	500U/ml (0.5U/μl)	100U/vial (100U/ml (0.1U/μl))
Injection concentration	0.05U/30μl/mice 0.1U/30μl/mice 0.5U/30μl/mice	0.05U/30μl/mice 0.5U/30μl/mice
stock volume	0.05U (0.1μℓ) 0.1U (0.2μℓ) 0.5U (1μℓ)	0.05U (0.5μℓ) 0.5U (5μℓ)



Ref) Huons - EMG report : 2016. 08

HUTOX Pre-Clinical Study

Completed the Pre-clinical studies in Mouse, Rat and Beagle Dog

Study Type	Route	Test System	Doses
Safety Pharmacology			
Effects on Central Nervous System	IM	Mouse/ICR	0, 1.5, 3, 6 U/kg
Effects on Central Respiratory System	IM	Rat/Sprague Dawley	0, 1.5, 3, 6 U/kg
Effects on hERG current	In vitro	HEK cell	0, 0.03, 0.3, 1.3 U/mL
Effects on Cardiovascular parameters	IM	Dog/Beagle	0, 3, 10, 30 U/kg
Toxicology			
Single dose	IM	Rat/Sprague Dawley	0, 6, 30, 150 U/kg
Single dose	IM	Dog/Beagle	0, 100, 200 U/kg
Repeated dose	IM	Rat/Sprague Dawley	0, 1.5, 3, 6 U/kg/week
Repeated dose	IM	Dog/Beagle	0, 3, 10, 30 U/kg/week
Reproductive and Developmental Toxicity			
Embryo-fetal development	IM	Rat/Sprague Dawley	0, 0.16, 0.4, 1U/kg/day
Embryo-fetal development	IM	Rabbit/New Zealand White	0, 0.05, 0.1, 0.2 U/kg/day

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