SEMAGLUTIDE

GLP-1

01

MOLECULAR FORMULA	C187 H291 N45 O59
MOLECULAR WEIGHT	4114 g/mol
SEQUENCE	H-Aib-Glu-Gly-Thr-Phe-Thr-Ser-Asp-Val-Ser-Ser-Tyr-Leu-Glu-Gly-Gln-Ala-Ala-Lys(ε-γ-Glu-2xOEG-C18)-Glu-Phe-Ile-Ala-Trp-Leu-Val-Arg-Gly-Arg-Gly-OH

PROTOCOL

CONTENT & POTENCY

INJECTABLE: 1 mg/mL subcutaneous solution provided in a 5 mL multi-dose vial.

SUGGESTED DOSAGE

INJECTABLE:

- **Initial Dose:** Inject 0.25 mg (0.25 mL) subcutaneously once weekly for the first 4 weeks.
- **Maintenance Dose:** Increase to 0.5 mg (0.5 mL) once weekly for the next 4 weeks.
- **Optional Dose Adjustment:** Increase further to 1 mg (1 mL) or up to 2.4 mg weekly based on research objectives and tolerance.

DESCRIPTION

Semaglutide is a synthetic peptide hormone that mimics the natural effects of glucagon-like peptide-1 (GLP-1), a 30-31 amino acid peptide known for its role in regulating blood sugar levels. By enhancing insulin secretion in a glucose-dependent manner and suppressing glucagon release, semaglutide plays a crucial role in glycemic control.

Beyond its primary function in diabetes management, research suggests that semaglutide may offer a wide range of health benefits. Studies indicate its potential to support heart, liver, and lung function, as well as its neuroprotective properties through the inhibition of amyloid beta plaque accumulation.

Additionally, semaglutide has been shown to significantly reduce appetite by delaying gastric emptying and slowing intestinal motility, making it a promising candidate for weight management research.

BENEFITS OF SEMAGLUTIDE

Semaglutide, a GLP-1 receptor agonist, offers a range of benefits supported by research, making it a promising candidate for diabetes management, weight loss, and other health applications. Its ability to mimic natural hormones allows for improved metabolic regulation and broader health advantages.

- Effective Glycemic Control
- Weight Management
- Cardiovascular Support
- Neuroprotection
- Liver Function Support
- Sustained Effectiveness

https://pubchem.ncbi.nlm.nih.gov/compound/56843331
https://pdb101.rcsb.org/global-health/diabetes-mellitus/drugs/incretins/drug/semaglutide/semaglutide

IGF-1 LR 3

Insulin-Like Growth Factor-1 Long Arginine 3

02

MOLECULAR FORMULA	C400 H625 N111 O115 S9
MOLECULAR WEIGHT	9117.60 g/mol
SEQUENCE	Tyr-Gln-Pro-Pro-Ser-Thr-Asn-Lys-Asn-Thr-Lys-Ser-Gln-Arg-Arg-Lys-Gly-Ser-Thr-Phe-Glu-Glu-Arg-Lys-Cys-Arg.

PROTOCOL

CONTENT & POTENCY

INJECTABLE: Administer 50 mcg (0.05 mL) subcutaneously once daily.

SUGGESTED DOSAGE

INJECTABLE:

- **Initial Dose:** Administer 50 mcg (0.05 mL) subcutaneously once daily.
- **Maintenance Dose:** Depending on individual response and research objectives, the dose may be increased to 100 mcg (0.1 mL) per day.

DESCRIPTION

IGF-1 LR3 (Insulin-like Growth Factor-1 Long Arg3) is a synthetic analog of the naturally occurring IGF-1 hormone. This modified version has an arginine substitution at the third position and an additional 13 amino acids at the N-terminus, resulting in a total of 83 amino acids. These modifications significantly reduce its affinity for IGF-binding proteins, thereby enhancing its biological activity and extending its half-life to approximately 20–30 hours.

Functionally, IGF-1 LR3 acts as a potent agonist of the IGF-1 receptor, promoting cellular growth and development. Its prolonged activity and increased potency make it a subject of interest in various research areas, including muscle growth, metabolic regulation, and tissue repair.

BENEFITS OF IGF-1 LR3

IGF-1 LR3 is studied for its potential effects on muscle growth, metabolic function, and tissue regeneration, making it a promising research compound.

- Enhanced Muscle Growth
- Improved Metabolic Function
- Accelerated Tissue Repair
- Reduced Protein Degradation
- Extended Biological Activity
- Lower Binding to IGF-Binding Proteins

https://paramountpeptides.com/products/igf-1lr3
https://en.wikipedia.org/wiki/IGF-1_LR3#:~:text=The%20amino%20acid%20sequence%20of,PTGYGSSSRR%20APQTGIVDEC%20CFRSCDLRRL%20EMYCAPLKPA%20KSA.

NAD+

Nicotinamide Adenine Dinucleotide

03

MOLECULAR FORMULA	C21 H26 N7 O14 P2
MOLECULAR WEIGHT	662.4 g/mol
SEQUENCE	Adenine–Ribose–Phosphate–Nicotinamide–Ribose–PhosphateAdenine–Ribose–Phosphate–Nicotinamide–Ribose–Phosphate

PROTOCOL

CONTENT & POTENCY

INJECTABLE: 50 mg/mL sterile solution provided in a 10 mL vial.

SUGGESTED DOSAGE

INJECTABLE:

- **Initial Dose:** Administer 500 mg (10 mL) intravenously over a 2-hour period, once daily, for 3 consecutive days.
- **Maintenance Dose:** Administer 500 mg intravenously once weekly, or as directed by research protocols.

DESCRIPTION

Nicotinamide Adenine Dinucleotide (NAD+) is a vital coenzyme found in all living cells, playing a crucial role in energy metabolism and cellular function. It serves as a key electron transporter in redox reactions, essential for ATP production in mitochondria.

Beyond its metabolic functions, NAD+ is involved in DNA repair, gene expression regulation, and maintaining genomic stability. Research indicates that NAD+ levels decline with age, and replenishing these levels may have potential therapeutic benefits in age-related diseases, neurodegenerative disorders, and metabolic conditions.

BENEFITS OF IGF-1 LR3

NAD+ supplementation has been studied for its potential therapeutic effects in various clinical contexts.

- Enhanced Energy Metabolism
- Neuroprotection
- DNA Repair Support
- Anti-Inflammatory Effects
- Improved Mitochondrial Function
- Potential Longevity Benefits

https://pubchem.ncbi.nlm.nih.gov/compound/15938971
https://paramountpeptides.com/products/nad

PT-141

Bremelanotide

04

MOLECULAR FORMULA	C50 H68 N14 O10
MOLECULAR WEIGHT	1025.2 g/mol
SEQUENCE	AC-Nle-cyclo[Asp-His-D-Phe-Arg-Trp-Lys]-OH

DESCRIPTION

PT-141, also known as Bremelanotide, is a synthetic peptide analog of alpha-melanocyte-stimulating hormone (α-MSH). It functions as a melanocortin receptor agonist, primarily targeting the MC4 receptor, which is implicated in sexual arousal and desire.

Unlike traditional treatments for sexual dysfunction that act on the vascular system, PT-141 works directly through the central nervous system to enhance sexual desire. It has been approved by the FDA for the treatment of hypoactive sexual desire disorder (HSDD) in premenopausal women.

PROTOCOL

CONTENT & POTENCY

INJECTABLE: 50 mg/mL sterile solution provided in a 10 mL vial.

SUGGESTED DOSAGE

INJECTABLE:

- **Initial Dose:** Inject 1.75 mg (0.3 mL) subcutaneously into the abdomen or thigh at least 45 minutes before anticipated sexual activity.
- **Maintenance Dose:** Do not administer more than once within a 24-hour period and not more than eight times per month.

BENEFITS OF PT-141

PT-141 has been studied for its potential to enhance sexual desire and arousal through central mechanisms, offering an alternative approach to traditional therapies.

- Increased Sexual Desire
- Improved Arousal
- Central Mechanism of Action
- Rapid Onset of Effect
- Alternative to Vascular-Based Therapies
- Potential Applicability in Both Genders

https://paramountpeptides.com/products/pt-141-10mg
https://pubchem.ncbi.nlm.nih.gov/compound/9941379

HCG

Human Chorionic Gonadotropin

05

MOLECULAR FORMULA	C1105 H1770 N318 O336 S26
MOLECULAR WEIGHT	1025.2 g/mol
SEQUENCE	Thr-Ser-His-Pro-Leu-Ser-Leu-Pro-Ile-Thr-Leu-Val-Asp-Lys-Gly-Val-Asp-Ile-Leu-Ile-Thr-Asp-Ser-Gln-Asn-Lys-Asp-Phe-Leu-Ser-Leu-Pro-Glu-Trp-Val-Gln-Ser-Asn-Asp-Thr-Leu-Cys-Phe-Ser-Glu-Ile-Thr-Gly-Leu-Pro-Pro-Leu-Glu-Thr-Leu-Ser-Val-Asn-Ser-Leu-Pro-Asp-Ile-Gln-Leu-Arg-Arg-Pro-Ile-Gly

PROTOCOL

CONTENT & POTENCY

INJECTABLE: 5,000 IU or 10,000 IU lyophilized powder for reconstitution, provided in single-use vials.

SUGGESTED DOSAGE

INJECTABLE:

- **For Ovulation Induction in Females: Administration:** Administer a single intramuscular (IM) injection of 5,000 to 10,000 IU following follicular development, as determined by clinical monitoring.
- **For Hypogonadotropic Hypogonadism in Males: Administration:** Inject 1,000 to 2,000 IU IM two to three times per week.

DESCRIPTION

Human Chorionic Gonadotropin (HCG) is a glycoprotein hormone produced during pregnancy by the developing embryo and later by the placenta. Structurally similar to luteinizing hormone (LH), HCG binds to LH receptors, stimulating the corpus luteum to produce progesterone, essential for maintaining the uterine lining.

In clinical settings, HCG is utilized to induce final oocyte maturation in assisted reproductive technologies and to treat certain cases of infertility in both men and women. Additionally, HCG is employed in the management of cryptorchidism and hypogonadism in males.

BENEFITS OF HCG

HCG has been extensively studied for its role in reproductive health and its therapeutic applications in various clinical conditions.

- Induction of Ovulation
- Treatment of Male Hypogonadism
- Management of Cryptorchidism
- Support of Luteal Phase in Assisted Reproductive Technologies
- Stimulation of Testosterone Production
- Assessment of Testicular Function

https://paramountpeptides.com/products/hcg
https://en.wikipedia.org/wiki/Human_chorionic_gonadotropin

TIRZEPATIDE

GLP-1

06

MOLECULAR FORMULA	C225 H348 N48 O68
MOLECULAR WEIGHT	4813 g/mol
SEQUENCE	Tyr-Aib-Glu-Gly-Thr-Phe-Thr-Ser-Asp-Tyr-Ser-Ile-Aib-Leu-Asp-Lys-Ile-Ala-Gln-Lys(Eicosanedioyl-isoGlu-PEG2-PEG2)-Ala-Phe-Val-Gln-Trp-Leu-Ile-Ala-Gly-Gly-Pro-Ser-Ser-Gly-Ala-Pro-Pro-Pro-Ser-NH2

PROTOCOL

CONTENT & POTENCY

INJECTABLE: Tirzepatide is available in pre-filled pens delivering doses of 2.5 mg, 5 mg, 7.5 mg, 10 mg, 12.5 mg, and 15 mg per 0.5 mL solution.

SUGGESTED DOSAGE

INJECTABLE:

- **Initial Dose:** Administer 2.5 mg subcutaneously once weekly for 4 weeks.
- **Maintenance Dose:** Increase to 5 mg once weekly for at least 4 weeks.
- **Optional Dose Adjustment:** Based on individual response and tolerability, incrementally increase the dose by 2.5 mg every 4 weeks, up to a maximum of 15 mg once weekly.

DESCRIPTION

Tirzepatide is a novel, once-weekly injectable peptide that functions as a dual glucose-dependent insulinotropic polypeptide (GIP) and glucagon-like peptide-1 (GLP-1) receptor agonist.

By activating both GIP and GLP-1 receptors, tirzepatide enhances insulin secretion, suppresses glucagon release, and slows gastric emptying, leading to improved glycemic control and weight reduction. It has been approved for the management of type 2 diabetes and is under investigation for obesity treatment.

BENEFITS OF TIRZEPATIDE

Tirzepatide has demonstrated significant benefits in clinical studies, making it a promising agent for metabolic health management.

- Improved Glycemic Control
- Significant Weight Reduction
- Enhanced Insulin Sensitivity
- Reduced Cardiovascular Risk Factors
- Dual Hormone Receptor Activation
- Convenient Once-Weekly Dosing

https://pubchem.ncbi.nlm.nih.gov/compound/168009818
https://pdb101.rcsb.org/global-health/diabetes-mellitus/drugs/incretins/drug/tirzepatide/tirzepatide

BPC-157

Body Protection Compound-157

MOLECULAR FORMULA	C62 H98 N16 O22
MOLECULAR WEIGHT	1419.5 g/mol
SEQUENCE	Gly-Glu-Pro-Pro-Pro-Gly-Lys-Pro-Ala-Asp-Asp-Ala-Gly-Leu-Val

DESCRIPTION

BPC-157, short for Body Protection Compound 157, is a synthetic peptide consisting of 15 amino acids. Derived from a protective protein found in human gastric juice, it has been studied for its potential regenerative and healing properties.

Research indicates that BPC-157 may promote tissue repair, reduce inflammation, and support angiogenesis, making it a subject of interest in various clinical investigations.

PROTOCOL

CONTENT & POTENCY

INJECTABLE: Typically available as a lyophilized powder in vials containing 5 mg of BPC-157, intended for reconstitution with bacteriostatic water.

SUGGESTED DOSAGE

INJECTABLE:

- **Administration:** After reconstitution, administer 1 to 10 micrograms per kilogram of body weight per day, divided into two doses, via subcutaneous injection.
- **Duration:** Treatment duration varies based on research objectives but commonly ranges from 2 to 4 weeks.

BENEFITS OF BPC-157

BPC-157 has been investigated for its potential therapeutic effects in various preclinical studies.

- Accelerated Wound Healing
- Enhanced Tendon and Ligament Repair
- Gastrointestinal Protection
- Anti-Inflammatory Properties
- Neuroprotective Effects
- Angiogenesis Promotion

https://paramountpeptides.com/products/bpc-157-10mg
https://pubchem.ncbi.nlm.nih.gov/compound/9941957

TB500

Synthetic Thymosin Beta-4

MOLECULAR FORMULA	C38 H68 N10 O14
MOLECULAR WEIGHT	889.0 g/mol
SEQUENCE	Ac-Ser-Asp-Lys-Pro-Asp-Met-Ala-Glu-Ile-Glu-Lys-Phe-Asp-Lys-Thr-Tyr-Thr-Val-Pro-Val-Thr

08

PROTOCOL

CONTENT & POTENCY

INJECTABLE: Typically supplied as a lyophilized powder in vials containing 2 mg or 5 mg of TB-500, intended for reconstitution with bacteriostatic water.

SUGGESTED DOSAGE

INJECTABLE:

- **Loading Phase:** Administer 2.0 to 2.5 mg of TB-500 subcutaneously or intramuscularly twice weekly for the first 4 to 6 weeks.
- **Maintenance Phase:** After the initial period, reduce the dosage to 2.0 to 2.5 mg once weekly or bi-weekly, depending on research objectives and observed effects.

DESCRIPTION

TB-500, also known as Thymosin Beta-4, is a synthetic peptide that mirrors a naturally occurring protein present in various tissues of the body. It plays a pivotal role in cell migration, angiogenesis (formation of new blood vessels), and tissue regeneration. By binding to actin, a structural protein, TB-500 facilitates cellular movement and growth, contributing to accelerated wound healing and repair processes.

Its potential therapeutic applications have been explored in contexts such as muscle injuries, tendon and ligament repair, and inflammation reduction.

BENEFITS OF TB500

TB-500 has been investigated for its potential therapeutic effects in various preclinical studies.

- Accelerated Wound Healing
- Enhanced Muscle Recovery
- Improved Flexibility
- Reduced Inflammation
- Promotion of Angiogenesis
- Support for Tissue Regeneration

https://pubchem.ncbi.nlm.nih.gov/compound/62707662
https://paramountpeptides.com/products/thymosin-beta-4-tb500

MK-677

Human Growth Hormone

09

MOLECULAR FORMULA	C28 H40 N4 O8 S2
MOLECULAR WEIGHT	624.8 g/mol

DESCRIPTION

MK-677, also known as Ibutamoren, is an orally active, non-peptide growth hormone secretagogue that mimics the action of ghrelin by binding to the ghrelin receptor (GHS-R1a). This interaction stimulates the release of growth hormone (GH) and increases insulin-like growth factor 1 (IGF-1) levels without significantly affecting cortisol levels.

Due to its ability to promote GH secretion, MK-677 has been investigated for potential applications in conditions such as growth hormone deficiency, muscle wasting, and osteoporosis.

PROTOCOL

CONTENT & POTENCY

ORAL CAPSULES: 25 mg per capsule, typically provided in bottles containing 30 capsules.

SUGGESTED DOSAGE

- **ORAL ADMINISTRATION:**
  - **Standard Dose:** Administer 25 mg orally once daily.
  - **Duration:** Clinical studies have utilized treatment periods ranging from 2 weeks to 12 months, depending on the research objectives.

BENEFITS OF MK-677

MK-677 has been studied for its potential therapeutic effects in various clinical contexts.

- Increased Lean Body Mass
- Enhanced Sleep Quality
- Improved Bone Mineral Density
- Elevated Growth Hormone and IGF-1 Levels
- Potential Cognitive Function Support
- Possible Metabolic Rate Enhancement

https://pubchem.ncbi.nlm.nih.gov/compound/6450830

RETATRUTIDE

GLP-1

10

MOLECULAR FORMULA	C221 H342 F3 N46 O68
MOLECULAR WEIGHT	4731.34 g/mol
SEQUENCE	Tyr-{Aib}-Gln-Gly-Thr-Phe-Thr-Ser-Asp-Tyr-Ser-Ile-{α-Me-Leu}-Leu-Asp-Lys-{diacid-C20-gamma-Glu-(AEEA)-Lys}-Ala-Gln-{Aib}-Ala-Phe-Ile-Glu-Tyr-Leu-Leu-Glu-Gly-Gly-Pro-Ser-Ser-Gly-Ala-Pro-Pro-Pro-Ser-NH2

PROTOCOL

CONTENT & POTENCY

INJECTABLE: Retatrutide is supplied as a sterile solution in pre-filled pens delivering doses of 2 mg, 4 mg, 8 mg, and 12 mg per 0.5 mL.

SUGGESTED DOSAGE

INJECTABLE:

- **Initial Dose:** Administer 2 mg subcutaneously once weekly for 4 weeks.
- **Dose Escalation:** Increase to 4 mg once weekly for the subsequent 4 weeks.
- **Maintenance Dose: B**ased on individual response and tolerability, further escalate the dose to 8 mg and then to 12 mg once weekly, with each escalation occurring at 4-week intervals.

DESCRIPTION

Retatrutide is an investigational, once-weekly injectable peptide that functions as a triple receptor agonist, targeting the glucose-dependent insulinotropic polypeptide (GIP) receptor, glucagon-like peptide-1 (GLP-1) receptor, and glucagon receptor.

By simultaneously activating these pathways, retatrutide aims to enhance insulin secretion, suppress glucagon release, and promote weight loss through appetite regulation and increased energy expenditure. This multifaceted mechanism positions retatrutide as a promising candidate for the management of obesity and type 2 diabetes.

BENEFITS OF RETATRUTIDE

Retatrutide has demonstrated significant benefits in clinical studies, making it a promising agent for metabolic health management.

- Substantial Weight Reduction
- Improved Glycemic Control
- Enhanced Insulin Sensitivity
- Reduction in Cardiovascular Risk Factors
- Potential Liver Fat Reduction
- Convenient Once-Weekly Dosing

https://en.wikipedia.org/wiki/Retatrutide
https://www.medchemexpress.com/retatrutide.html?srsltid=AfmBOorxQlfEmElypgUgFcJd1VfWh_K_jPq7WPF6yVO2f61uh28yqVB1

GONADORELIN

GnRH Agonist

11

MOLECULAR FORMULA	C55 H75 N17 O13
MOLECULAR WEIGHT	1182.3 g/mol
SEQUENCE	pGlu-His-Trp-Ser-Tyr-Gly-Leu-Arg-Pro-Gly-NH2

PROTOCOL

CONTENT & POTENCY

INJECTABLE: Available as gonadorelin acetate in vials containing 0.2 mg/mL solution.

SUGGESTED DOSAGE

DIAGNOSTIC USE:

- **Administration:** Administer a single intravenous (IV) bolus of 100 micrograms.
- **Procedure:** Collect blood samples for LH and FSH levels at baseline, then at 15, 30, 45, and 60 minutes post-injection to evaluate pituitary function.

THERAPEUTIC USE:

- **Administration:** Administer 5 to 20 micrograms subcutaneously or intravenously every 90 minutes using an infusion pump to mimic natural pulsatile secretion.
- **Duration:** Therapy duration varies based on the condition being treated and patient response.

DESCRIPTION

Gonadorelin, also known as gonadotropin-releasing hormone (GnRH), is a decapeptide produced by the hypothalamus. It plays a pivotal role in regulating the reproductive system by stimulating the anterior pituitary gland to secrete luteinizing hormone (LH) and follicle-stimulating hormone (FSH).

These hormones are essential for gonadal function, including ovulation in females and spermatogenesis in males. Clinically, gonadorelin is utilized to assess pituitary function and has applications in treating reproductive disorders such as hypothalamic amenorrhea and delayed puberty.

BENEFITS OF GONADORELIN

Gonadorelin has been studied for its potential therapeutic effects in various clinical contexts.

- Assessment of Pituitary Function
- Induction of Ovulation in Women with Hypothalamic Amenorrhea
- Treatment of Delayed Puberty
- Evaluation of Hypogonadism
- Potential Aid in Fertility Treatments
- Diagnostic Tool for Reproductive Disorders

https://pubchem.ncbi.nlm.nih.gov/compound/638793
https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/gonadorelin-associated-peptide#:~:text=Gonadorelin%20(G)%20is%20a%20bioactive,2

EPITHALON

Synthetic Tetrapeptide

MOLECULAR FORMULA	C14 H22 N4 O9
MOLECULAR WEIGHT	390.35 g/mol
SEQUENCE	Ala-Glu-Asp-Gly

PROTOCOL

CONTENT & POTENCY

INJECTABLE: Typically supplied as a lyophilized powder in vials containing 50 mg of Epithalon, intended for reconstitution with sterile water for injection.

SUGGESTED DOSAGE

INJECTABLE:

- **Administration:** After reconstitution, administer 10 mg (0.2 mL) subcutaneously every 2 to 3 days.
- **Duration:** Continue for a total of 15 injections, amounting to a cumulative dose of 150 mg per cycle.
- **Frequency:** This cycle can be repeated twice yearly, with a 6-month interval between cycles.

DESCRIPTION

Epithalon, also known as Epitalon, is a synthetic tetrapeptide with the sequence Ala-Glu-Asp-Gly. It is derived from epithalamin, a natural polypeptide extracted from the bovine pineal gland. Epithalon has been the subject of research due to its potential role in regulating the aging process.

Studies suggest that it may influence telomerase activity, thereby affecting telomere length and cellular senescence. Additionally, Epithalon has been investigated for its potential effects on melatonin production, oxidative stress reduction, and modulation of the endocrine system.

BENEFITS OF EPITHALON

Epithalon has been investigated for its potential therapeutic effects in various preclinical and clinical studies.

- Telomere Length Maintenance
- Antioxidant Properties
- Regulation of Melatonin Production
- Modulation of the Endocrine System
- Potential Anti-Tumor Effects
- Improved Sleep Quality

https://pubchem.ncbi.nlm.nih.gov/compound/219042
https://en.wikipedia.org/wiki/Epitalon#:~:text=Epitalon%20is%20a%20tetrapeptide%20with,22N4O9

GLUTATHIONE

Antioxidant

13

MOLECULAR FORMULA	C10 H17 N3 O6S
MOLECULAR WEIGHT	307.33 g/mol
SEQUENCE	γ-Glu-Cys-Gly

PROTOCOL

CONTENT & POTENCY

INJECTABLE: Available in vials containing 600 mg of reduced glutathione for reconstitution with sterile water.

SUGGESTED DOSAGE

INJECTABLE:

- **Administration:** Administer 600 mg intravenously twice weekly.
- **Duration:** Treatment duration may vary based on research objectives and patient response.

DESCRIPTION

Glutathione is a tripeptide composed of glutamine, cysteine, and glycine, serving as a critical antioxidant within the human body. It plays a pivotal role in neutralizing reactive oxygen species, detoxifying harmful compounds, and maintaining cellular redox balance.

Beyond its antioxidant properties, glutathione is integral to various physiological processes, including DNA synthesis and repair, protein synthesis, and immune system modulation. Altered glutathione homeostasis has been implicated in numerous pathological conditions, such as neurodegenerative disorders, cardiovascular diseases, and metabolic syndromes.

BENEFITS OF GLUTATHIONE

Glutathione has been extensively studied for its potential therapeutic effects in various clinical contexts.

- Antioxidant Defense
- Detoxification Support
- Immune System Enhancement
- Skin Health Improvement
- Liver Function Support
- Potential Neuroprotective Effects

https://pubchem.ncbi.nlm.nih.gov/compound/124886
https://www.sciencedirect.com/topics/chemistry/glycys#:~:text=Glutathione%20(GSH)%20is%20a%20ubiquitous,incompatible%20with%20long%2Dterm%20survival.

SLU-PP-332

Non-Selective Estrogen-Related Receptor (ERR) Agonist

14

MOLECULAR FORMULA	C10 H17 N3 O6S
MOLECULAR WEIGHT	307.33 g/mol

PROTOCOL

CONTENT & POTENCY

FORMULATION: SLU-PP-332 is typically supplied as a lyophilized powder intended for reconstitution.

SUGGESTED DOSAGE

- **ADMINISTRATION:**
  - **Route:** Oral administration has been utilized in preclinical studies.
  - **Dosage:** Specific dosing regimens have not been established for human studies; preclinical research in mice utilized dosages that would require careful scaling for human application.

DESCRIPTION

SLU-PP-332 is an investigational small molecule that functions as a pan-agonist of estrogen-related receptors (ERRs), particularly ERRα, ERRβ, and ERRγ. By activating these receptors, SLU-PP-332 aims to mimic the metabolic effects of exercise, enhancing mitochondrial function, increasing energy expenditure, and promoting fatty acid oxidation.

Preclinical studies have demonstrated its potential in improving exercise endurance, reducing fat accumulation, and enhancing insulin sensitivity, positioning it as a promising candidate for addressing metabolic disorders such as obesity and type 2 diabetes.

BENEFITS OF SLU-PP-332

Preclinical studies have indicated several potential benefits of SLU-PP-332:

- Enhanced Exercise Endurance
- Increased Energy Expenditure
- Improved Insulin Sensitivity
- Reduction in Fat Accumulation
- Promotion of Mitochondrial Biogenesis
- Potential Cardioprotective Effects

AOD 9604

ADVANCE OBESITY DRUG

(Modified Peptide Fragment Of High)

MOLECULAR FORMULA	$C_{78}H_{123}N_{23}O_{23}S^2$
MOLECULAR WEIGHT	18115.1
SEQUENCE	Tyr-Leu-Arg-Ile-Val-Gln-Cys-Arg-Ser-Val-Glu-Gly-Ser-Cys-Gly-Phe

PROTOCOL

CONTENT & POTENCY

INJECTABLE: 1200mcg/ml subcutaneous injectable provided in a 5ml vial.

SUGGESTED DOSAGE

INJECTABLE: Inject 0.25ml subcutaneously once daily for 20 days.

DESCRIPTION

AOD 9604 is a modified form of amino acids 176-191 of the GH polypeptide.
Investigators at Monash University discovered that the fat-reducing effects of GH appear to be controlled by a small region near one end of the GH molecule. This region, which consists of amino acids 176-191, is less than 120% of the total size of the GH Molecule and appears to have no elders on growth or insulin resistance.

This hypothesis was proven in animals to a tremendous degree with specimen to losing a significant amount of fat mass. However, in phase three clinical trials the peptide didn't mean its confidence interval .Instead, it is now being studied för its effect on bone and cartilage.
AOD 9604 possesses many other regenerative properties associated with growth hormone. Currently trials are underway to show the application of AOD 9604 in osteoarthritis, Hypercholesterolemia, bone and cartilage repair. AOD 9604 has an excellent safety profile, recently obtaining Human GRAS status in the USA.

CLINICAL RESEARCH

SAFETY AND TOLERABILITY OF THE HEXADECAPEPTIDE AOD 9604 IN HUMANS
HEIKE STIER, EVERT VOS, DAVID KENLEY

Background: The human growth hormone (hGH) has fat loss properties making it a potential candidate to treat obesity. AOD 9604 is a peptide fragment of the C-terminus of hGH (Tyr-hGH177-191), which harbors the fat reducing activity of hGH, without its negative effects. In this paper the safety data of AOD 9604 obtained in clinical trials are summarized.
Methods: Six randomized, double-blind, placebo-controlled trials were performed with AOD 9604. Special focus was given to undesired effects associated with hGH treatment: increases in IGF-1 levels, insulin resistance, and impaired glucose tolerance. Blood samples were analyzed for presence of anti-AOD 9604 antibodies to exclude immunogenicity.
Results: AOD 9604 had no effect on serum IGF-1 levels, which confirms the hypothesis that AOD 9604 does not act via IGF-1. Results of oral glucose tolerance test demonstrated that, in contrast with hGH, AOD 9604 has no negative effect on carbohydrate metabolism. There were no anti-AOD 9604 antibodies detected in any of the patients selected for antibody assays; in none of the studies did a withdrawal or serious adverse event occur related to intake of AOD 9604.
Conclusion: AOD 9604 displayed a very good safety and tolerability profile indistinguishable from placebo. AOD 9604 did not result in any of the adverse effects associated with full-length hGH treatment.

BPC-157
PHYSICIAN EDUCATION

WHAT IS BPC-157?

BPC-157 is a pentadecapeptide made up of 15 amino acids. It is a partial sequence of the body protection compound (BPC) derived from human gastric juice. Experiments have shown that it heightens the healing of many different types of tissues, including: tendon, muscle, nervous system, and is superior at healing damaged ligaments.

Patients who suffer from discomfort due to sprains, tears, and tissue damage may benefit from treatment with this peptide as it can increase blood flow back to the injured sites. BPC-157 may protect organs, prevent stomach ulcers, and heal skin burns.

BENEFITS

Patient benefits over time may include:

- Accelerated wound healing
- Decreased inflammation
- Increased fibroblast
- Nitric oxide improvement
- Improves digestive function
- Enhanced vascular expression of VEGFR2

TYPICAL PRESCRIBING PROTOCOL:

- Prescribing is often based on body weight using 2mcg/kg to as much as 10mcg/kg twice daily.
- Commonly used doses range from 200mcg to 400mcg twice daily (400mcg to 800mcg daily).
- If used twice daily, intramuscular injection as close to the injury as possible or via subcutaneously for systemic purposes.
- Use for 2-4 weeks before discontinuing; cease therapy for 2 weeks, then restart therapy if needed.

"This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease."

The information provided here is for reference only and is not to be relied upon as making any representation as to the efficacy of any particular formulations. The sample formulations described here result from prescriptions previously ordered by professionals licensed to write prescriptions in their respective discipline. Nothing here is intended to replace or influence the independent judgment of any licensed professional.

REFERENCE:
Chang, C.H., et al. "The Promoting Effect of Pentadecapeptide BPC 157 on Tendon Healing Involves Tendon Outgrowth, Cell Survival, and Cell Migration." NCBI, 11 Mar. 2011.

CJC-1295/ IPAMORELIN

PHYSICIAN EDUCATION

WHAT IS CJC-1295?

CJC-1295 is a tetrasubstituted 29-amino acid Growth Hormone Releasing Hormone (GHRH) analog. It stimulates a release of HGH and IGF-1 without raising prolactin levels, leading to fat loss and increased protein synthesis thereby promoting growth of muscle. Our CJC-1295 is compounded without DAC (Drug Affinity Complex), which provides a more effective GH spike resembling a normal physiological release of GH.

WHAT IS IPAMORELIN?

HOW IS IT USED WITH CJC-1295?

CJC-1295 is a tetrasubstituted 29-amino acid Growth Hormone Releasing Hormone (GHRH) analog. It stimulates a release of HGH and IGF-1 without raising prolactin levels, leading to fat loss and increased protein synthesis thereby promoting growth of muscle. Our CJC-1295 is compounded without DAC (Drug Affinity Complex), which provides a more effective GH spike resembling a normal physiological release of GH.

BENEFITS

Patient benefits over time may include:

- Promotes slow wave sleep
- Improves memory retention
- Stimulates muscle growth
- Aids in fat loss & lean muscle

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TYPICAL PRESCRIBING PROTOCOL:

- Benefits can be seen using as little as 100 mcg of each CJC-1295/Ipamorelin.
- Injections can be done before bed or TID.
- Recommended to take at least 30 minutes away from food.
- Patients with a higher BMI or high estrogen levels may require larger doses.

A *30 doses 0.07 cc (7 units) subcutaneous*
Provides 133 mcg/133 mcg per injection

B *20 doses 0.10 cc (10 units) subcutaneous*
Provides 200 mcg/200 mcg per injection

C *40 doses 0.05 cc (5 units) subcutaneous*
Provides 100 mcg/100 mcg per injection (AM + PM)

GHK-CU

COLLAGEN & AESTHETIC PEPTIDE

MOLECULAR FORMULA	$C_{28}H_{52}CuN_{12}O_8$
MOLECULAR WEIGHT	748.346 g/mol
SEQUENCE	Gly-His-Lys(cu^{2+})

PROTOCOL

CONTENT & POTENCY

- **INJECTABLE:** 10 mg/mL subcutaneous injection provided in a 5 mL vial.
- **TRANSDERMAL (SCALP):** 5 mg/mL (0.5%) topical foam provided in a 50 mL foaming applicator.
- **TRANSDERMAL (FACIAL):** 5 mg/mL (0.5%) facial cream provided in a 15 gm pump.

SUGGESTED DOSAGE

- **INJECTABLE:** Inject 0.2 mL subcutaneously once daily.
- **TRANSDERMAL (SCALP):** Apply 2-3 pumps to scalp once daily at night.
- **TRANSDERMAL (FACIAL):** Apply 1-2 pumps to face and rub in at night.

DESCRIPTION

GHK-Cu is a naturally occurring copper complex that was first identified in human plasma, but has since been found in multiple locations such as saliva and urine. Copper peptides are small, naturally occurring protein fragments that have high affinity for copper ions, which evidence suggests are critical to normal body function. Clinical studies indicate that GHK-Cu has a variety of roles in the human body including, but not limited to, promoting wound healing, attracting immune cells, antioxidant and anti-inflammatory effects, stimulating collagen and glycosaminoglycan synthesis in skin fibroblasts, and promoting blood vessel growth.

There has been some clinical evidence that has shown that GHK-Cu acts as a feedback signal generated after tissue injury, and it may act as a potent protector of tissue and anti-inflammatory agent possibly by reducing the oxidative damage that occurs post-tissue injury. Further, GHK-Cu has been found to be involved in signaling tissue remodeling by removing damaged/scarred tissue and generating healthy tissue. It has been shown in studies that GHK concentration decreases with age because the concentration of GHK-Cu in the body decreases with age which may result in an increase in inflammation, cancerous activity, and tissue destruction.

CLINICAL RESEARCH

PICKART L, VASQUEZ-SOLTERO JM, MARGOLINA A.
GHK PEPTIDE AS A NATURAL MODULATOR OF MULTIPLE CELLULAR PATHWAYS IN SKIN REGENERATION.
BIOMED RES INT 2015;2015:648108.
DOI: 10.1155/2015/648108. EPUB 2015 JUL 7.

GHK (glycyl-L-histidyl-L-lysine) is present in human plasma, saliva, and urine but declines with age. It is proposed that GHK functions as a complex with copper 2+ which accelerates wound healing and skin repair. GHK stimulates both synthesis and breakdown of collagen and glycosaminoglycans and modulates the activity of both metalloproteinases and their inhibitors. It stimulates collagen, dermatan sulfate, chondroitin sulfate, and the small proteoglycan, decorin. It also restores replicative vitality to fibroblasts after radiation therapy. The molecule attracts immune and endothelial cells to the site of an injury. It accelerates wound-healing of the skin, hair follicles, gastrointestinal tract, boney tissue, and foot pads of dogs. It also induces systemic wound healing in rats, mice, and pigs. In cosmetic products, it has been found to tighten loose skin and improve elasticity, skin density, and firmness, reduce fine lines and wrinkles, reduce photodamage, and hyperpigmentation, and increase keratinocyte proliferation. GHK has been proposed as a therapeutic agent for skin inflammation, chronic obstructive pulmonary disease, and metastatic colon cancer. It is capable of up- and downregulating at least 4,000 human genes, essentially resetting DNA to a healthier state. The present review revisits GHK's role in skin regeneration in the light of recent discoveries.

MELANOTAN II

TANNING AND FAT LOSS

MOLECULAR FORMULA	$C_{50}H_{59}N_{15}O_9$
MOLECULAR WEIGHT	1024.2
SEQUENCE	Ac-Nle-Asp-His-D-Phe-Arg-Trp-Lys-NH_2(cyclic 2-7)

PROTOCOL

CONTENT & POTENCY

INJECTABLE: 5 ml at 2000 mcg/ml: ready-to-inject subcutaneously

SUGGESTED DOSAGE

INJECTABLE: 0.15 ml daily for 1 - 2 weeks then 0.25 ml twice weekly for maintenance.

DESCRIPTION

Melanotan I and Melanotan II are both analogs of the peptide hormone alpha-melanocyte stimulating hormone (α-MSH) that induces skin tanning. Like its predecessor, Melanotan I, MT 2 plays a role in stimulating melanogenesis and thus provides a protective mechanism against UV rays since under its actions melanocytes are able to increase production and secretion of the hormone melanin.

Scientists have also noticed that MT 2 had a positive effect on libido due to its aphrodisiac properties. Additionally, MT 2 exhibits a mild positive fat-mobilizing effect. Melanotan I is an FDA approved drug under the brand name Scenesse. Scenesse is most commonly used to treat patients that have an intolerance to light.

CLINICAL RESEARCH

DORR RT, LINES R, LEVINE N, BROOKS C, XIANG L, HRUBY VJ, HADLEY ME.
SOURCE: COLLEGE OF MEDICINE, PHARMACOLOGY DEPARTMENT, UNIVERSITY OF ARIZONA, TUCSON, USA.

Abstract: A pilot phase I study was conducted with a cyclic heptapeptide analog of alpha-melanocyte stimulating hormone (alpha-MSH). The lactam-bridged molecule, called Melanotan-II (MT-II), has the structure Ac-Nle4-Asp5-His6-D-Phe7-Arg8-Trp9-Lys10 alpha-MSH4-10-NH2 (MT-II) and has supported melanotropic activity in vitro. A single-blind, alternating day (saline or MT-II), placebo-controlled trial was conducted in 3 normal male volunteers at the starting dose of 0.01 mg/kg of MT-II. Subcutaneous injections of MT-II or saline were given daily (Monday-Friday) for 2 consecutive weeks. Two subjects were escalated by 0.005 mg/kg increments to 0.03 mg/kg and one to 0.025 mg/kg. The 0.03 mg/kg dose produced Grade II somnolence and fatigue in one of two subjects (WHO standards). Mild nausea, not requiring antiemetic treatment, was reported at most MT-II dose levels. A stretching and yawning complex appeared to correlate with the onset of spontaneous, penile erections which were intermittently experienced for 1-5 hours after MT-II dosing, depending on the MT-II dose. Two subjects had increased pigmentation in the face, upper body, and buttocks, as measured by quantitative reflectance and by visual perception 1 week after MT-II dosing ended. These results demonstrate that MT-II has tanning activity in humans given only 5 low dose every other day by subcutaneous injection. The recommended single MT-II dose for future Phase I studies is 0.025 mg/kg/day.

SEMAX

ADVANCE OBESITY DRUG

20

MOLECULAR FORMULA	C37 H51 N9 O10 S
MOLECULAR WEIGHT	813.92 g/mol
SEQUENCE	Met-Glu-His-Phe-Pro-Gly-Pro

DESCRIPTION

Heptapeptide SEMAX (MEHFPGP) is the analogue of ACTH (4-10) that has a demonstrated prolonged neurotropic activity. This has historically been used in patients with pathologies related to brain circulation dysfunction. It has also been suggested in literature that due to its effect on carboxypeptidase it may also increase physical performance and adaptation capacities in exposure to high intensity exercise and at higher doses, >0.5 mg/kg, may exhibit analgesic-like effects.

PROTOCOL

CONTENT & POTENCY

1 mg/mL subcutaneous injection provided in a 5 mL Vial.

SUGGESTED DOSAGE

Inject 0.3-1 mL subcutaneously twice per week, depending on patient response.

CLINICAL RESEARCH

MANCHENKO DM, GLAZOVA NLU, LEVITSKAIA NG, ET AL. NOOTROPIC AND ANALGESIC EFFECTS OF SEMAX FOLLOWING DIFFERENT ROUTES OF ADMINISTRATION. ROSS FIZIOL ZH IM I M SECHENOVA. 2010 OCT; 96(10):1014-23.

The heptapeptide Semax (MEHFPGP) is an analog of the fragment ACTH(4-10) with long-lasting actions. The aim of the present work was to study the effects of Semax on learning ability and pain sensitivity in white rats given different doses via the intraperitoneal and intranasal routes. The nootropic effects of Semax were studied in a test based on the acquisition of a conditioned passive avoidance reaction to pain stimulation. Pain sensitivity was assessed in a hindpaw compression test. The results showed that i.p. Semax had nootropic and analgesic actions. Dose-response characteristics were different for these different effects. Intranasal Semax was more effective in improving learning in animals than i.p. Semax but had no effect on pain sensitivity. Our results provide evidence that different mechanisms and brain structures are involved in mediating the nootropic and analgesic effects of Semax.

SERMORELIN
PHYSICIAN FAQs

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HOW TO RECONSTITUTE LYOPHILIZED VIALS

We recommend the following for any size vial to calculate a 30-day supply:

- 6mg Vial with 6mL reconstitution; (0.2mL=200mcg) & (0.3mL=300mcg)
- 9mg Vial with 6mL reconstitution; (0.2mL=300mcg) & (0.3mL=450mcg)
- 15mg Vial with 6mL reconstitution; (0.2mL=500mcg) & (0.3mL=750mcg)

*Make sure that your patient knows that a sterile multi-use vial should be discarded after 28-30 days.

CAN I DOSE BY WEIGHT OR BMI?

If dosing based on BMI, this requires adjustments for male/female patients due to the blunting effect estrogen has on GH/IGF-1 production. Also, BMI should not be totally relied upon for dosing as BMI does not take into account lean muscle mass. The patient's overall health and fitness status should be considered rather than dosing based on a number value from a patient's weight and height alone.

BMI	MEN	WOMEN
18-24	200mcg	300mcg
25-29	400mcg	400-500mcg

SIDE EFFECTS

Most common is injection site reaction (pain; redness; swelling). Less than 1% dizziness, flushing, headache or hyperactivity.

WHAT IS THE MINIMUM AMOUNT OF TIME A PATIENT SHOULD TAKE BEFORE THEY SEE RESULTS?

Most patients will begin to feel sleep changes in the first week. For best results, patients should commit to using for 90 days to feel the full benefits.

WHAT IF MY PATIENT DID NOT SEE A CHANGE THEY HOPED FOR?

Just as with BHRT, therapy changes in the body are measured in both the labs and in the feedback from your patients. It's important to discuss both as well as their expectations.

WHAT IS INCLUDED WITH THE SHIPMENT?

In each shipment from Wells Pharmacy, the patient will be provided the following for each kit ordered:

- Vial of medication
- Vial of diluent
- Mixing syringe with an attached needle
- #2 alcohol pads for mixing purposes

*All supplies for injections are sold separately.

WILL MY PATIENTS EXPERIENCE HUNGER?

It can be caused for some by the stimulation of ghrelin for a small percentage of patients using GHRP-6.

THE IGF-1 LABS DID NOT CHANGE?

The feedback from the patient on how they are feeling is equally important as the lab testing. Remember, that you are treating a patient and not a number. In some patients the dosage may need to be titrated up or converted to a blend of all 3 (GHRH/GHRP-2/GHRP-6) to experience results. (It is important that the labs are measured at the same time every time).

PATIENTS ON PREVIOUSLY ON HUMAN GROWTH HORMONE WILL THIS WORK?

Yes, however in some rare cases Sermorelin therapy will not work if somatostatin has inhibited all GH production. High levels of GH can cause an increase in somatostatin via the feedback loop and decrease GH production. Because GHRP inhibits somatostatin, the addition of GHRP to Sermorelin will assist in decreasing somatotrophs; thereby, increasing the number of somatotrophs and subsequently increase somatropin and GH production to a larger extent than using Sermorelin alone.

POSSIBLE OVERDOSE?

No, due to the saturation effect. This therapy has also been shown to help rebuild and preserve pituitary function for many patients.

IS THIS PRODUCT FDA APPROVED?

Sermorelin was FDA approved in 1997 to treat GH deficiency, in 2002 Geret from Serono was discontinued in part due to the high cost. The chemicals purchased by Wells Pharmacy are from FDA approved facilities and vendors.

HALF-LIFE?

Sermorelin has a half-life of 11-12 minutes following subcutaneous administration *Per original package insert.

TESAMORELIN

GH RELEASING HORMONE

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MOLECULAR FORMULA	$C_{221}H_{366}N_{72}O_{13}S$
MOLECULAR WEIGHT	5135.77
SEQUENCE	Trans-hexenoyl-acid-Tyr-Asp-Ala-Phe-Thr-Asn-Ser-Tyr-Arg-Lys-Val-Leu-Gly-Gln-Leu-Ser-Ala-Arg-Lys-Leu-Leu-Gln-Asp-Ile-Met-Ser-Arg-Gln-Gln-Gly-Glu-Ser-Asn-Gln-Glu-Arg-Gly-Ala-Arg-Ala-Arg-Leu-NH_2

PROTOCOL

CONTENT & POTENCY

Tesamorelin/IPamorelin 6 mg/1.5 mg Lyophilized Kit (4 vials per kit) for subcutaneous injection.

SUGGESTED DOSAGE

Reconstitute each vial with 3 mL and inject 0.5 mL subcutaneously before bed 6 out of 7 nights 90 minutes after last food intake. One vial should be reconstituted at a time.

DESCRIPTION

Tesamorelin is a growth hormone releasing hormone analog that increases IGF-1 levels in men and women by an average of 181 micrograms/liter. It binds to and stimulates GHRH receptors with similar potency as endogenous GHRH. It has a host of other benefits including nootropic effects and reducing triglycerides.

Tesamorelin has subsequently been shown to decrease carotid intima-media thickness (cIMT), visceral adipose tissue (VAT), and c-reactive protein (CRP). It has not been linked to significantly affect other pituitary hormones and their respective mechanisms in the body. Additionally, it may improve cognitive function for healthy seniors and patients with an increased risk of Alzheimer's disease, due to mild cognitive impairment.

- Stanley T, Chen C, Branch K, et al. Effects of a Growth Hormone-Releasing Hormone Analog on Endogenous GH Pulsatility and Insulin Sensitivity in Healthy Men. J Clin Endocrinol Metab, January 2016, 91(1):150-158
- Makimura H, Feldpausch M, Rope A, et al. Metabolic Effects of a Growth Hormone-Releasing Factor in Obese Subjects with Reduced Growth Hormone Secretion: A Randomized Controlled Trial. J Clin Endocrinol Metab. December 2012, 97(12):4769-4779

CLINICAL RESEARCH

EFFECTS OF A GROWTH HORMONE-RELEASING HORMONE ANALOG ON ENDOGENOUS GH PULSATILITY & INSULIN SENSITIVITY IN HEALTHY MAN.

TAKARA L. STANLEY, CINDY Y. CHEN, KAREN L. BRANCH, HIDEO MAKIMURA, AND STEVEN K. GRINSPOON

PROGRAM IN NUTRITIONAL METABOLISM AND NEUROENDOCRINE UNIT (T.L.S., C.Y.C., H.M., S.K.G.) AND THE CLINICAL RESEARCH CENTER (K.L.B.), MASSACHUSETTS GENERAL HOSPITAL AND HARVARD MEDICAL SCHOOL, BOSTON, MASSACHUSETTS 02114

Background: Strategies to augment pulsatile GH may be beneficial in patients with excess visceral adiposity, in whom GH secretion is reduced. The objective of this study was to determine the effects of a novel GHRH (GHRH-44) analog, tesamorelin, on endogenous GH pulsatility and insulin sensitivity in healthy men.

Methods: Thirteen males (mean age 45 ± 3 yr and body mass index 27.3 ± 1.2 kg/m^2) received tesamorelin 2 mg sc once daily for 2 wk, with assessment made at baseline, after 2 wk of treatment, and after 2 wk of withdrawal. The primary end point was change in mean overnight GH as determined by overnight frequent sampling. Secondary end points included insulin-stimulated glucose uptake as measured by euglycemic hyperinsulinemic clamp; IGF-I; and GH secretion parameters, including pulse area, pulse frequency, and basal secretion.

Results: Tesamorelin treatment increased mean overnight GH (change +0.5 ± 0.1 μg/liter, P = 0.004), average log10 GH peak area (change +0.4 ± 0.1 log10 μg/liter, P = 0.001), and basal GH secretion (change +0.008 ± 0.003 μg/liter, P = 0.008). IGF-I increased by 181 ± 22 μg/liter (P < 0.0001). Neither fasting glucose (P = 0.93) nor insulin-stimulated glucose uptake (P +0.61) was significantly affected by tesamorelin.

Conclusion: Once-daily short-term treatment with a GHRH-44 analog, tesamorelin, augments basal and pulsatile GH secretion. Moreover, although tesamorelin significantly increases IGF-I, peripheral insulin-stimulated glucose uptake appears to be preserved. (J Clin Endocrinol Metab 96: 150–158, 2011).

THYMOSIN ALPHA 1

MOLECULAR FORMULA	C37 H51 N9 O10 S
MOLECULAR WEIGHT	813.92 g/mol
SEQUENCE	Ac-Ser-Asp-Ala-Ala-Val-Asp-Thr-Ser-Ser-Glu-Ile-Thr-Lys-Asp-Leu-Lys-Gly-Lys-Val-Val-Glu-Glu-Ala-Glu-Asn-OH

PROTOCOL

CONTENT & POTENCY

INJECTION: 3000 mcg/mL subcutaneous injection provided in a 5 mL vial.

SUGGESTED DOSAGE

INJECTION: Inject 0.15 mL subcutaneously daily.

DESCRIPTION

Thymosin Alpha 1 (TA1) is a peptide originally isolated from thymic tissue and is a compound believed to be responsible for restoring immune function in thymectomized mice. Thymosin Alpha 1 has been shown to have a pleiotropic mechanism of action and affects multiple immune cell subsets that are involved in immune suppression. Studies have demonstrated improvements in immune system cell subsets and the potential of TA1 for the treatment of a range of diseases. Thus, Thymosin Alpha 1, due to the immune stimulating effects exhibited by TA1, may have utility for the treatment of age or disease-related immune suppression.

CLINICAL RESEARCH

KING R, TUTHILL C. IMMUNE MODULATION WITH THYMOSIN ALPHA 1 TREATMENT. VITAM HORM. 2016; 102:151-78. DOI: 10.1016/BS.VH. APRIL 3, 2016. EPUB MAY 24, 2016.

Thymosin A1 (TA1), a thymosin-related 28-mer synthetic amino-terminal acetylated peptide, has gained increasing interest in recent years, due to its pleiotropy. The peptide has been used worldwide as an adjuvant or immunotherapeutic agent to treat disparate human diseases, including viral infections, immunodeficiencies, and malignancies. The peptide can enhance T cell, dendritic cell (DC), and antibody responses, modulate cytokine and chemokine production, and block steroid-induced apoptosis of thymocytes. Its central role in modulating DC function and activating multiple signaling pathways that contribute to different functions may offer a plausible explanation for its pleiotropic action. Additionally, the ability of TA1 to activate the indoleamine 2,3-dioxygenase enzyme—which confers immune tolerance during transplantation and restrains the vicious circle of chronic inflammation—has been a turning point, suggesting a potential, specific function in immunity. Accordingly, TA1 has recently been shown to promote immune reconstitution and improve survival of recipients of HLA-matched sibling T cell-depleted stem cell transplants in a phase I/II clinical trial. Thus, TA1 continues to live up to its promises.