ANASPEC

# Peptides

**For Life Science Research**

- **Custom peptides**
- **Quantified** peptides
- **Heavy isotope** labeled peptides
- **FRET** peptides
- **Cyclic** peptides
- Peptide-oligo **conjugates**
- **Catalog** peptides

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## 25 YEARS OF PEPTIDE ENGINEERING

AnaSpec, a subsidiary of Eurogentec, has a long-standing peptide expertise during which it has consistently provided reliable products and services for the global Life Science research community, and striven to meet the most stringent expectations for quality, delivery timelines, and technical support.

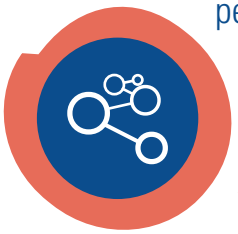
## CUSTOM & CATALOG PEPTIDE INNOVATION

The development of diverse peptide synthesis platforms allows for the production of complex peptides.

AnaSpec catalog peptides are specially categorized for quick recognition of peptides that fit your research needs.

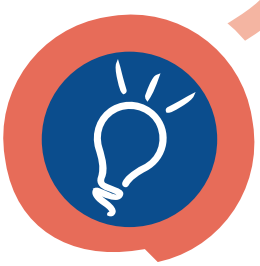
## TRUSTED QUALITY

Ranked high by our customers for product quality, we work hard to ensure our products and services meet your expectations for identity, purity, and delivery time.



Specializing in **complex** peptides such as hydrophobic peptides, or those with multiple modifications

1 mg **to gram** quantities



Technical **support** that can guide you all the way from quotation to delivery


ISO 9001 **certified quality system**

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# AnaSpec Peptides

## Custom | Catalog



## Annexes



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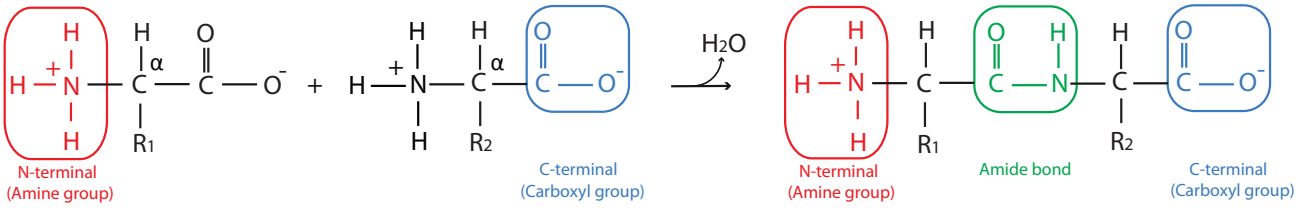
# ANATOMY OF A PEPTIDE

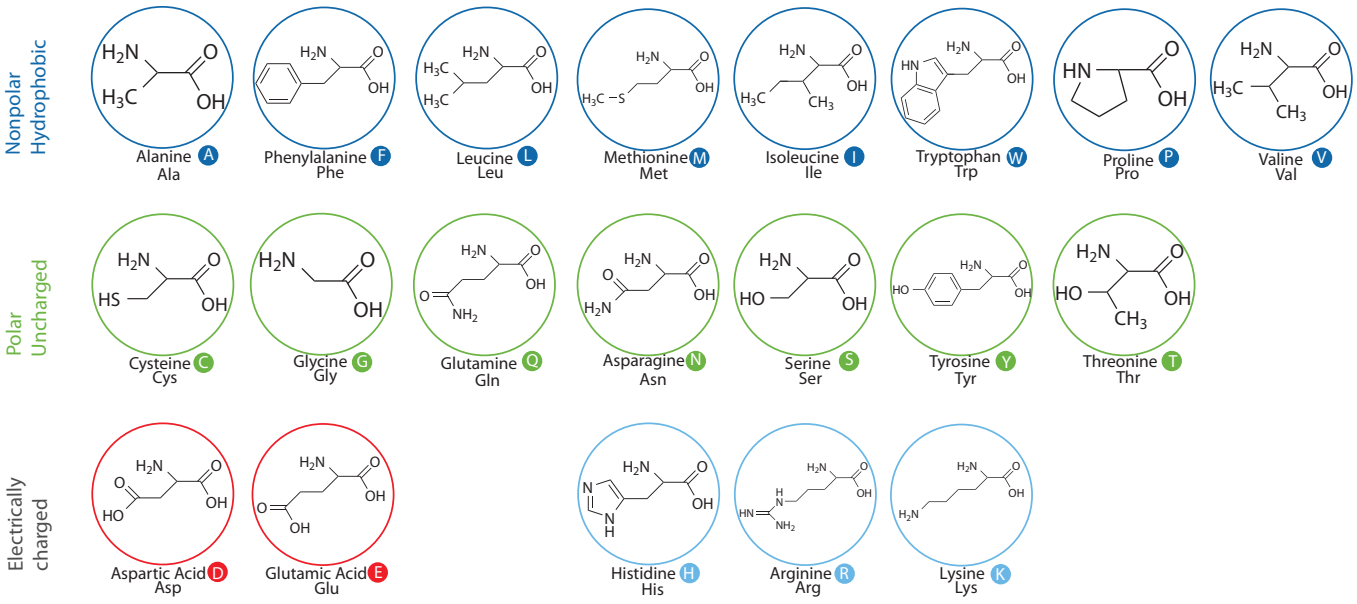
Peptides are vital to every living cell of the body and possess a variety of biochemical activities. They can function as enzyme modulators, hormones, antibiotics, and receptors. Under or over expression of certain peptides can play a role in specific disease states such as Diabetes, Cardiovascular diseases, and Alzheimer's disease. Examples of well known peptides include insulin and endorphins.

A peptide is a short polymer of amino acids linked together by peptide bonds also known as amide bonds (CO-NH bond). The peptide is formed when the carboxyl group of one amino acid reacts with the amine group of another amino acid in a dehydration reaction. The resultant peptide carries an amine group at the N-terminus and a carboxyl group at the C-terminus. AnaSpec can synthetically produce complex peptides, incorporating any of the 20 standard amino acids or other unnatural amino acids (UAADs) (glycosylated, azide containing, methylated, etc). Additionally we can engineer structural modifications, such as cyclizations.




## THE 20 STANDARD AMINO ACIDS

The 20 standard amino acids are "proteinogenic" meaning they are naturally genetically encoded and can be incorporated into proteins during translation. In contrast, unnatural amino acids are "non-proteinogenic" because they are not encoded genetically, or incorporated during translation.
Each amino acid carries a unique R group that renders it with specific chemical properties. In turn, the amino acids in a peptide sequence dictate the peptide properties such as hydrophobicity, solubility, and charge. L amino acids are the natural form (designated by upper case letters), and D amino acids are the unnatural form (designated by lower case letters). ■

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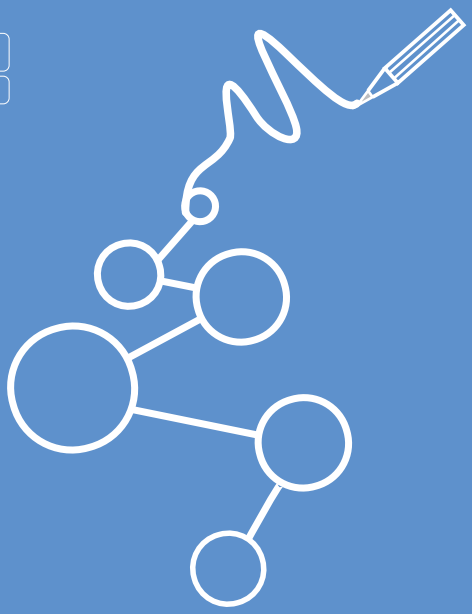

# Custom
## peptides

Our peptide engineers are capable of optimizing your peptides by leveraging a vast degree of expertise in chemical peptide synthesis gained through our >20 years of experience, customer collaborations, and stringent quality standards. We also know that confidentiality is important to you, and will treat your project and data with the utmost care and security. ■

## STANDARD PEPTIDES

We offer a versatile platform for the synthesis of custom peptides (simple and complex modifications), which cater to several applications including drug discovery research.

Both solid phase and liquid phase syntheses are employed. The fundamental premise of solid phase synthesis involves the incorporation of N-α-amino acids into a peptide of the desired sequence with one end of the sequence remaining attached to a solid support matrix. While the peptide is being synthesized usually by stepwise methods, all soluble reagents can be removed from the peptide-solid support matrix by filtration and washed away at the end of each amino acid coupling step. After the desired sequence of amino acids has been obtained, the peptide is cleaved from the polymeric support. Additional liquid phase synthesis can be employed depending on the type of modification(s) requested on the peptide.■

## SPECIFICATIONS

**Length:** 2-60 amino acids.

**Purity:** >95%, >90%, >85%, >70%, or crude.
Tip: Purity is assessed by HPLC analysis, and indicates the % of the target peptide in the peptidic mix.

**Quantity:** 1mg minimum to gram quantities (0.5mg available for specified modifications)
Quantity can be delivered as gross weight or net weight.
When absolute quantification is a must, we recommend our Quant-peptides (see p.10). For less stringent requirements, we offer peptide content based on CHN analysis.

**Counter-Ion:**
Default is TFA (Trifluoroacetic Acid) which binds to the peptide N-terminus, and to basic Lys, Arg and His residues. As TFA can be toxic to cells and animals, we also offer an acetate or chloride salt exchange for an additional fee.

**QC Testing:**
- Identity by Mass Spec Analysis
- % Purity by HPLC, additional testing upon request
- Water content determination
- CHN Analysis

Inquire for other custom analysis

**Documentation:** Mass Spec and HPLC chromatographs, technical data sheet.

**Format:** Lyophilized powder, peptide in solution on request. For special format aliquots see Dispensing Service (p. 29)

**Shipping:**
Ambient temperature.

**Lead Time:**
3-5 weeks.
Highly modified peptides may require longer production times.


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## DID YOU KNOW?

**What is the difference between Net peptide amount, Gross peptide amount, and which does a Quant-Peptide offer?**
The industry standard is to deliver peptides in a lyophilized form and to state the delivery amount as the weight of the lyophilized powder "Gross weight". But beside the peptide of interest, the production mix contains other peptidic entities such as truncated peptide forms, deprotected peptides or incomplete peptide sequences. All together these peptidic molecules form the "peptide content".

The gross weight, in addition to the peptidic weight, contains and is largely influenced by other components such as residual solvent, water and the TFA counter-ion whose molecular mass is high (114Da). Hence TFA which binds to the free N-terminus of the peptide as well as to the basic residues, significantly contributes to the **gross weight** of the lyophilized material.

Therefore when ordering 1 mg of peptide, you will receive 1 mg of powder which may contain 60-80% peptide. The **net peptide content** (NPC) is the fraction of peptidic material present in the lyophilized material. In combination with the peptide purity, it allows to determine the exact amount of the peptide of interest. NPC is traditionally measured by amino acid analysis (AAA; limited accuracy but requires a low material amount) or elemental analysis (CHN; requires milligrams of peptide but is more accurate). Both methods measure total peptidic content.

Our Quant-Peptides correspond to two proprietary peptide quantitation methods (with and without Quant-Tag), offering net peptide content with better accuracy and reproducibility than AAA or CHN.
See p.10 for more information on the Quant-Peptides.

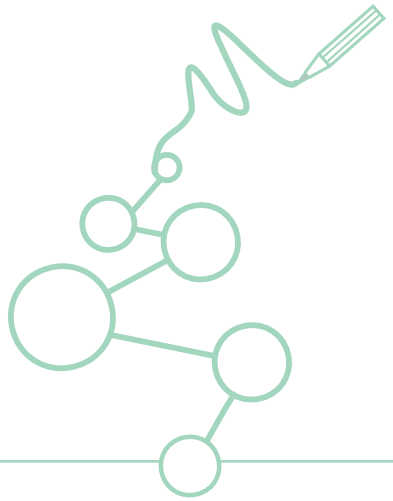
**What does "H" or "OH" signify at the ends of my peptide?**

These shorthand terms can be used when the peptide sequence is indicated using either the 3-letter or 1-letter amino acid code.
"H" at the left end N-terminus is shorthand for $NH_2$ and indicates a free amine. "OH" at the right end C-terminus is shorthand for COOH, and indicates a free carboxyl group.

For example:
H-Lys-Ala-Glu-OH is the same as $NH_2$-Lys-Ala-Glu-COOH
If your peptide is capped, an "Ac" at the N-terminus indicates a $CH_3$-CONH acetylation, while "$NH_2$" at the C-terminus is shorthand for a $CONH_2$ and indicates an amidation.

**Will a charge at the N or C terminus of your peptide interfere with your application or conjugation?**

We can "cap" the peptide N-terminus (Acetylation) or C-terminus (Amidation). This process can also help to better mimic the characteristics of a sequence within a protein.



## PURITY VS APPLICATIONS

| RECOMMENDED PURITY LEVEL | ≥ 90-95% | ≥ 80 - 85% | ≥ 70% | crude |
|---|---|---|---|---|
| APPLICATIONS | Blocking and competition assays<br>Enzyme-substrate studies (quantitative)<br>Receptor-ligand interaction studies (quantitative)<br>ELISA and RIA (quantitative)<br>*in vivo*/*in vitro* studies<br>**High precision quantitative** proteomics<br>(see Quant-Peptides p.10) | Western blotting studies (non-quantitative)<br>Enzyme-substrate studies (non-quantitative)<br>Phosphorylation studies<br>Affinity purification | Production of antibodies for immunizations<br>Determination of the titer of antibodies in standard ELISA | Screening purposes |

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# Modifications

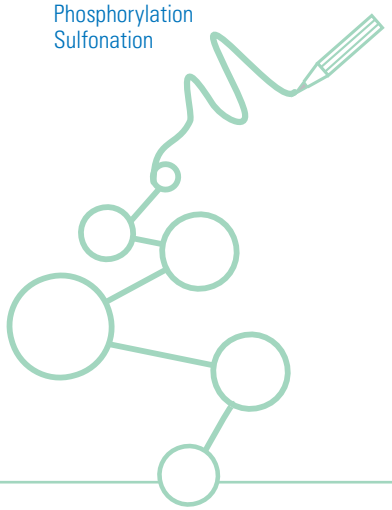
Peptide modification feasibility is dependent on the peptide sequence, properties and desired location. Hence, our technical team will review each request case by case.
Modifications can be of the following types:

> N-terminal
> C-terminal
> Structural
> Conjugation
> UAAD

Unnatural Amino Acid (UAADs) can be exploited to enhance the stability, or functionality of a therapeutic target, and can be site specifically incorporated into your synthetic custom peptides. Examples include post-translational modifications such as the carboxylation of glutamate (forming the UAA- gamma-carboxy glutamate), and hydroxylation of proline (forming the UAA-hydroxyproline). ■

## TABLE: MODIFICATIONS CLASSIFICATION

| N-Terminal | C-Terminal | Structural | Conjugation | UAAD | Other |
|---|---|---|---|---|---|
| Acetylation (caps charge) | Amidation (caps charge) | Cyclization | DOTA | Alkyne | Pegylations |
| Biotinylation | Biotinylation | Disulfide formation | BSA | Azide | Peptidomimetics |
| Fluorescent-dye | Fluorescent-dye | Hydrocarbon stapling | Prenylation | Glycosylated | |
| Formylation | Aldehydes (formylation) | Lactamation | Farnesylation | Heavy Isotope | |
| Myristoylation | Alcohol group | MAP formations | Geranylation | Methylations | |
| Succinylation | Hydrazide | Thiolactonation | Peptide-oligonucleotide | Phosphorylation | |
| Bromoacetylation | Esterification/thiol esters | | | Sulfonation | |
| DOTA conjugated | N-alkyl amidation | | | | |
| | Ketones (CMK, FMK) | | | | |



## MODIFICATIONS VS APPLICATIONS

| | Immunology-related studies | Protease activity /inhibitions | Protein folding and aggregation studies | Protein-protein interactions, membrane-transport/ function, signal transduction etc. | Drug delivery, cellular uptake, PK properties, bioactivity, conjugations etc. |
|---|---|---|---|---|---|
| APPLICATIONS | ↓ | ↓ | ↓ | ↓ | ↓ |
| RELATED MODIFICATIONS | Biotinylation<br>Formylation<br>Pegylation<br>MAPS<br>KLH/BSA conjugation | Alkylamidation<br>Thiolation<br>FRET-based assays | Glycosylation<br>Cysteamidation | Myristoylation<br>Phosphorylation<br>Peptidomimetics<br>Sulfonation | Prenylation<br>Farnesylation<br>Geranylation<br>Methylation<br>Cyclization<br>Br-acetylation<br>Succinylation<br>Stapling |

# QUANT-PEPTIDES

We exclusively offer 2 proprietary methods that are employed to **measure the net peptide content** of a target peptide in a peptide mixture. ■

When vial to vial reproducibility or net peptide quantity per vial is required, quant-peptides can be dispensed using our dispensing service. For quant-peptides, we can offer up to 100 aliquots/mg. Our service is performed in a controlled environment to ensure reproducibility and accuracy.
(see p. 29)

## APPLICATIONS

Quant-Peptides are accurately quantified for use as standards in high precision proteomics, such as in biomarker detection.

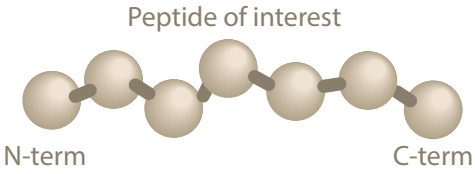
## BENEFITS

- More accurately quantified than by AAA or CHN analysis
- Precise net peptide quantity in every vial (vial to vial consistency)
- Convenient ready-to-use aliquots

## SPECIFICATIONS

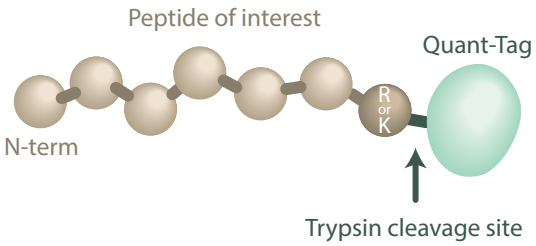
Light or heavy-isotope labeled peptides
**Purity:** >85 to >95%
**Minimum order amount:** 0.5mg

### Untagged Peptide




This option applies to peptides containing at least 2 of the following amino acids: F, I, K, L, P, R, V.
This Quant-peptide quantification is based on an optimized AAA-MS method. The peptide is hydrolyzed in acidic condition and the AAs is resolved individually (not derivatised) by HPLC-MS.

### Tagged peptide




This option is recommended for peptides that do not contain internal K, R or C residues, but do contain a C-terminal R or K. Quant-peptides with a Quant-Tag contain a proprietary tag with spectral properties. The Quant-Tag is coupled to the C-term of the peptide via an Arginine (R) or Lysine (K) residue and can be released by trypsin digestion. The precise molecular mass of the tag (1356,7 Da) can be used in assessing the trypsine cleavage efficacy of a sample and hence in setting the optimal trypsinization conditions of a sample using i.e. MS:MS methods.

# HEAVY ISOTOPE LABELED PEPTIDES

## APPLICATIONS

The use of mass spectrometry (MS) has helped advance proteomic research by providing qualitative information of thousands of known and unknown proteins. By spiking protein tryptic digests with internal heavy isotope labeled peptide standards, MS becomes an absolute quantitation method. These peptides are offered in gross quantities, or quantified using standard CHN analysis or the quant-peptide method.

## BENEFITS

Our heavy isotope-labeled custom peptide services offer a choice of heavy hydrogen ($^{2}H$), carbon ($^{13}C$), or nitrogen ($^{15}N$)-isotopes specifically labeled at single, multiple or universal positions. We can increase your peptide mass by several daltons according to your specifications.

## SPECIFICATIONS

Molecular Mass Increase: 1 or more daltons over mass of unlabeled peptide
**Purity:** >85 to >95%
**Minimum order amount:** 0.5mg

**ALSO AVAILABLE**

**Peptide Mass Spec Standards AS-60882**

This kit consists of two calibration mixtures for calibrating mass scale in MALDI-TOF or ESI mass spectrometry (range from 800 to 3800 daltons). ■

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# PEPTIDE-OLIGONUCLEOTIDE CONJUGATES

Peptide-oligonucleotide conjugates (POC) are molecular composites containing a nucleic acid moiety covalently linked to a polypeptide moiety. They serve many important roles as potential therapeutics and owing to their stability, can resist intracellular enzymes present in different cellular compartments. ■

## SPECIFICATIONS

| | |
|---|---|
| **Production quantities** | 1-20 mg |
| **Typical lead times** | 5-6 weeks |
| **Peptide length** | 5-22 amino acids |
| **Oligonucleotide length** | 10 - 40 bases |
| **Oligonucleotide modifications available** | Phosphorothioate linkage<br>Dye labeling (FAM, HEX ,TET, etc)<br>Biotinylation<br>Spacer (C3, HEG, etc) |
| **Peptide modifications available** | Acetylation<br>Dye Labeling (FAM, TAMRA) |
| **QC Analysis** | Mass Spectrometry |

## APPLICATIONS

> Oligo therapeutic target via conjugation to a cell permeable peptide, which acts as a cargo carrier of the oligonucleotide.

> Peptide conjugations to oligos with modifications designed for varied functionalities/applications.

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# FLUORESCENT LABELED PEPTIDES


## Fluorescent labels

We are pleased to support the scientific community by producing a broad range of premium classical and HiLyte™ fluorescent dyes for labeling and detection. These dyes are widely used to modify amino acids, peptides, proteins (in particular antibodies), oligonucleotides, nucleic acids, carbohydrates etc, and to detect cellular organelles and molecules. By spanning the whole visible and near infrared spectrum, you are sure to find a dye to suit your specific custom peptide application.

Classical dyes such as FAM, TAMRA and the CyLyte Fluor (Cy® Dyes analogues) are a great cost effective choice when operational pH range of your application is flexible.

HiLyte™ Fluor dyes are not affected by pH, making them an ideal choice when your application requires fluoresent detection at high or low pH (4-11).

Owing to their enhanced intensity and photostability, these dyes also exhibit higher sensitivities.
QXL® containing FRET substrates can offer fast and easy detection/HTS of protease activity/activators and inhibitors. These substrates are more sensitive than chromogenic substrates with linear dynamic range and great reproducibility.
Our line of QXL® quenchers match the most commonly used fluorescent donors and cover the full spectrum. ■

## BENEFITS

- Span the full visible and near infrared spectrum
- Available in a variety of reactive forms
- Can be paired with our proprietary QXL® Quenchers for FRET

**GOOD TO KNOW**

CyLyte Fluor are cost effective fluorescent dyes. They have the same organic structures as those of Cy® Dyes. CyLyte Fluor 3, CyLyte Fluor 5 and CyLyte Fluor 7 are available in two reactive forms (acid & NHS Ester). Cyanines are suitable for molecule labeling such as soluble proteins, antibodies, peptides, oligonucleotides, DNA and small molecules widely used in imaging, immunocytochemistry, flow cytometry and FRET applications. ■

## ORDERING INFORMATION

| PRODUCT NAME | abs/em (nm) | CAT# | | | | | |
|---|---|---|---|---|---|---|---|
| | | Hydrazide | Acid | Succinimidyl ester (NHS) | Amine | C2 Maleimide | Hydroxylamine |
| HiLyte™ Fluor 488 | 497/525 | AS-81163 | AS-81160 | AS-81161-1 | AS-81162[1] | AS-81164 | AS-64348[2] |
| HiLyte™ Fluor 532 | 545/565 | AS-89343 | AS-89340 | AS-89341 | AS-89344 | AS-89342 | / |
| HiLyte™ Fluor 555 | 550/566 | / | AS-81250 | AS-81251 | AS-81252 | AS-81254- | / |
| HiLyte™ Fluor 647 | 650/675 | / | AS-81255 | AS-81256 | AS-81257 | AS-81259 | / |
| HiLyte™ Fluor 750 | 753/778 | AS-81268 | / | AS-81266 | AS-81267 | AS-81269 | / |
| CyLyte Fluor 3 | 550/564 | / | AS-89353 | AS-89356 | / | / | / |
| CyLyte Fluor 5 | 648/663 | / | AS-89354 | AS-89357 | / | / | / |
| CyLyte Fluor 7 | 750/773 | / | AS-89355 | AS-89358 | / | / | / |

[1] TFA salt
[2] HCl salt *single isomer*

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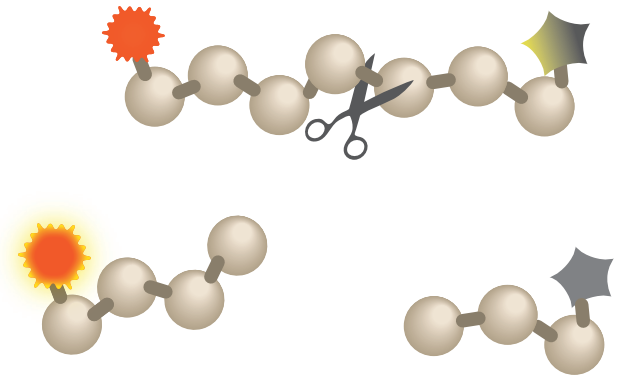
# FRET substrates

FRET (fluorescence resonance energy transfer) based assays have found broad applications, one of which is the detection of protease activity. As a world leader in FRET peptide technology we are proud to offer the same variety of long wavelength quencher and dye pairings used in our ID SensoLyte line of Protease activity assay kits. Our FRET pairs can be utilised in drug discovery, enabling extensive detection of protease activity to be faster, easier and compatible with HTS. FRET occurs between a peptide tagged to a donor and an acceptor when placed within 10-100Å of each other resulting in the donor's excitation fluorescence to be quenched by the acceptor. Enzymatic hydrolysis of the peptide results in recovery of the donor fluorescence following spatial separation of the donor and acceptor upon energy transfer. ■



## APPLICATIONS

**HTS detection** of protease activity, protease activators and inhibitors.

**Protease** based drug target screening and discovery protein-peptide interaction.

**Peptides with a dye-quencher pair**

| Dye | Ex/Em | Quencher |
|---|---|---|
| MCA | 325/393 nm | Dnp |
| EDANS | 335/493 nm | DABCYL, DABCYL Plus™, QXL® 490 |
| FAM | 492/518 nm | QXL®520 |
| FITC | 494/519 nm | QXL®520 |
| HiLyte™ Fluor 488 | 502/527 nm | QXL®520 |
| CyLyte Fluor 3 | 550/564nm | QXL®570 |
| HiLyte™ Fluor 532 | 545/565 nm | QXL®570 |
| HiLyte™ Fluor 555 | 550/566 nm | QXL®570 |
| TAMRA | 541/568 nm | QXL®570 |
| Rox | 568/591 nm | QXL®610 |
| CyLyte Fluor 5 | 648/663 nm | QXL®670 |
| HiLyte™ Fluor 647 | 650/675 nm | QXL®670 |
| CyLyte Fluor 7 | 750/773 nm | IR-QXL® |

### Specifications for FRET peptides

**Length:** 8-10 amino acids between dye and quencher
**Location:** N/C-terminal and internal labeling
**Quantity:** 1-200mg
**Purity:** 90-95%

### ALSO AVAILABLE

#### Catalog FRET-peptides

Combining our expertise in peptides and detection reagents synthesis, we are pleased to offer our unique collection of FRET peptides, which includes the following selection.

**SELECTION**

| Product | CAT # |
|---|---|
| 390 MMP FRET Substrate I<br>Mca - PLGL - Dpa - AR - NH2 | AS-27076 |
| 390 MMP FRET Substrate II<br>Mca - PLGL - Dpa – AR | AS-27079 |
| 520 MMP FRET Substrate IX<br>QXL® 520 - RPLALWRK(5 - FAM) - NH2 | AS-60576-01 |
| Bacterial Sortase Substrate I, FRET<br>DABCYL - LPETG - EDANS | AS-62231 |
| Cathepsin D and E FRET Substrate<br>Mca - GKPILFFRLK(Dnp) - r - NH2 | AS-61793 |
| Cls Substrate, C2 (5 - FAM/ QXL® 520)<br>5 - FAM - SLGRKIQIQ - K(QXL® 520) - NH2 | AS-61314 |
| HCV (Hepatitis C Virus) NS3/4A Protease Substrate<br>Ac - DE - Dap(QXL® 520) - EE - Abu - ψ - [COO]AS - C(5 - FAMsp) - NH2 | AS-60798 |
| HIV Protease FRET Substrate I<br>DABCYL - GABA - Ser - Gln - Asn - Tyr - Pro - Ile - Val - Gln - EDANS | AS-22992 |
| Renin FRET Substrate I<br>DABCYL-GABA-Ile-His-Pro-Phe-His-Leu-Val-Ile-His-Thr-EDANS | AS-24478 |

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# Fluorescent Tag

All dyes listed in FRET substrate table can also be used as stand-alone Fluorescent tags.

## Specifications

**Dye location:**
N/C terminal or internal labeling

## APPLICATIONS

- 2-photon/confocal microscopy
- Flow cytometry
- *In-vivo* imaging
- Used in making tandem conjugates with fluorescent proteins.

## Certificates of Analysis

**Protein CoA Includes**

- Spectral properties
- DOS: represents the amount of fluorophore molecules conjugated to one protein molecule
- Formulation, buffer composition
- Amount and concentration
- Optimal storage conditions

**Peptide CoA Includes**

- Lyophilized peptide:
- Mass Spec analysis
- HPLC analysis for purity
- Amount
- Liquid formulations also include:
- Concentration
- Spectral properties
- Optimal storage conditions

# Fluorogenic substrates

## APPLICATIONS

Fluorogenic substrates do not require a quencher, and contain a C-terminal dye that does not fluoresce until it is cleaved from the peptide (fluorescent form of dye is released).

**Peptides with a dye-quencher pair**

| Dye | Ex/Em |
|---|---|
| AMC | 351/430 nm |
| AFC | 382/480 nm |
| Rh110 | 501/527 nm |

## ALSO AVAILABLE

**Additional labels**

**Aminoluciferin**
(Bioluminescent Substrate)
**PNA**
(Chromogenic Substrate)


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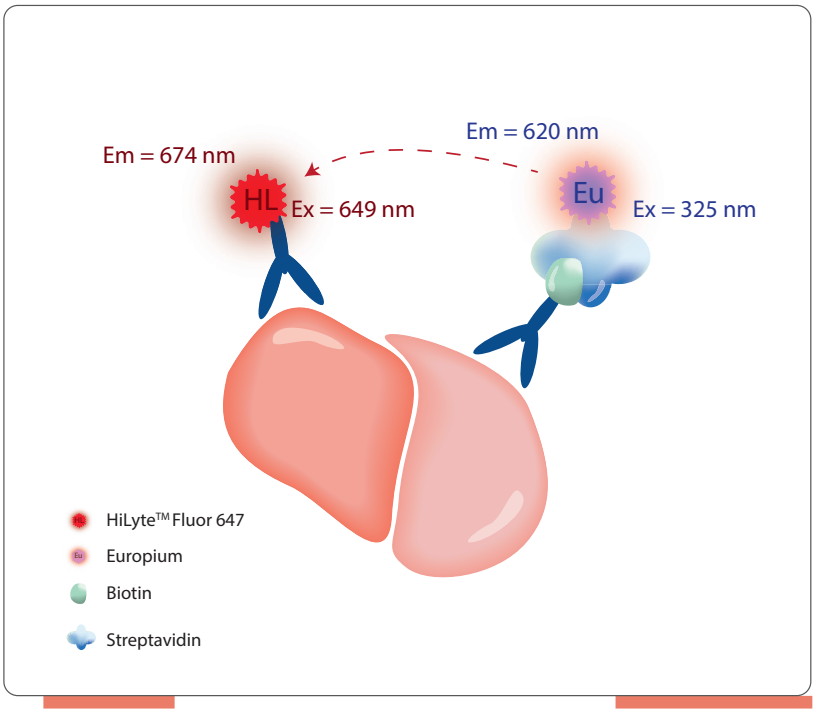
# TR-FRET

TR-FRET is a combination of Time Resolved Fluorescence (TRF) and Forster's Resonance Energy Transfer (FRET) technologies. This method offers the advantages of reducing background noise and providing a higher sensitivity and reliability than the FRET method. In TR-FRET instead of a fluorescent dye, the donor molecule is a Lanthanide metal such as Terbium (Tb) and Europium (EU). Their fluorescence is long-lived and is characterised by a large stokes shift providing a high signal-to-noise ratio due to minimal crosstalk between excitation and emission wavelengths. ■



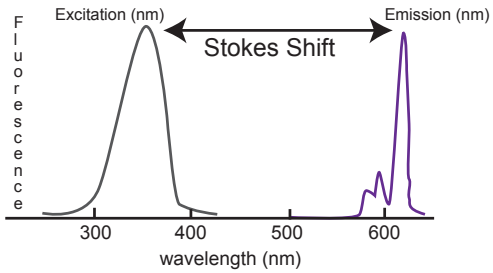




Fig 1. Stokes shift absorption and emission peaks for Europium.
Stokes shift is the difference between the absorption peak and the emission peak for fluorophores. Larger Stokes shift is always preferred which allows the use of broad excitation and emission filters that do not overlap, which in turn increases brightness and sensitivity. Fluorescent probes of smaller Stokes shift require filters that are very close together and do not include the entire area of the curves, thus reducing efficiency and brightness.

## BENEFITS

> Ideal for HTS
> Large dynamic range
> High sensitivity
> Low interference

## ASSAY DESIGN & DEVELOPMENT

> Preparation of substrates labeled with Europium and/or HiLyte™ Fluor 647
> Validation of assay with inhibitor(s) or biological compounds
> Detailed step by step assay protocol.

## APPLICATIONS

> FRET/TR-FRET substrates for protease activity detection
> Protease based drug target screening and discovery
> Protein-peptide interaction
> Protein-protein interaction

**TR-FRET pair**

| Donor | Ex/Em | Acceptor |
|---|---|---|
| Europium chelate | 325/620 nm | HiLyte™ Fluor 647 |
| Europium chelate | 325/620 nm | CyLyte Fluor 5 |

### GOOD TO KNOW

Typically biological samples generate fluorescence (proteins, antibodies, cells or tissues) that can interfere with the assay observations and therefore decrease the assay sensitivity.

TR (time-resolved) based assay technologies eliminate the background by choosing a longer detection interval after excitation, therefore increasing the assay sensitivity.


# AnaTag™ protein labeling kits

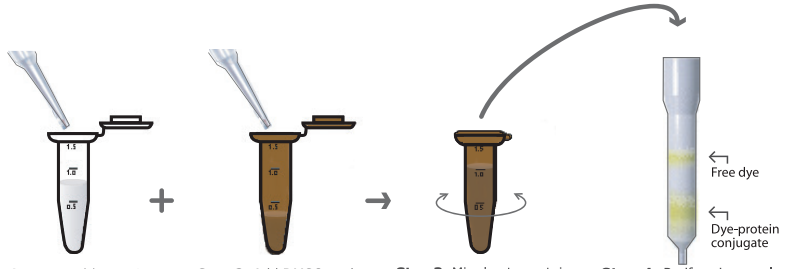
AnaTag™ kits provide a convenient way to label your proteins, such as those used as reagents in immunofluoresence staining, fluorescence *in situ* hybridisation, flow cytometry and other biological applications.
The kits use succinimidine ester (NHS ester) conjugates, which react with the amine groups of the target protein to form stable carboxamide bonds. Please note that AnaTag™ are not convenient to label peptides.

**Note:** APC, B-PE, and R-PE fluorescent protein kits, make use of an SMCC conjugation method.

## BENEFITS

> FAST labeling
> STABLE dye-protein conjugations
> CONVENIENT format
> All ESSENTIAL components for conjugation reactions and purification of dye-protein conjugates available.

Fig 2. Scheme for fluorophore/biotin AnaTag™ labelng kits.




**Step 1.** Add reaction buffer to protein (IgG)
**Step 2.** Add DMSO to dye
**Step 3.** Mix dye to protein, incubate 15' to 1h
**Step 4.** Purify using a column (shown above) or a spin column (microscale kit) up to 5 mg protein x 3 labelings

## ORDERING INFORMATION

| Label | Abs/Em (nm) | Catalog # REACTION SIZE 3 x 5 mg | Catalog # REACTION SIZE 3 x 200 µg |
|---|---|---|---|
| **FLUOROPHORES** | | | |
| AMCA-X | 353/442 | AS-72055 | AS-72056 |
| 5-FITC | 494/519 | AS-72059 | AS-72060 |
| HiLyte™ Fluor 488 | 502/527 | AS-72047 | AS-72048 |
| 5 TAMRA | 547/574 | AS-72063 | AS-72064 |
| HiLyte™ Fluor 555 | 552/569 | AS-72045 | AS-72046 |
| HiLyte™ Fluor 647 | 649/674 | AS-72049 | AS-72050 |
| HiLyte™ Fluor 750 | 754/778 | AS-72043 | AS-72044 |
| **FLUORESCENT PROTEINS** | | | |
| APC | 650/660 | AS-72111 (1x1mg) | n.a. |
| B-PE | 545/575 | AS-72112 (1x1mg) | n.a. |
| R-PE | 565/575 | AS-72113 (1x1mg) | n.a. |
| **BIOTIN** | | | |
| Biotin | n.a. | AS-72057 (3x10mg) | AS-72058 |
| **EUROPIUM** | | | |
| Europium chelate | 325/620 nm | n.a. | AS-72246 (1x200 µg) |
| Europium chelate & HiLyte™ Fluor 647 | Eu: 325/620 nm<br>HL 647: 649/674 nm | n.a. | AS-72247 (HL: 1x200 µg, Eu: 1x 200 µg) |

# CYCLIC CUSTOM PEPTIDES

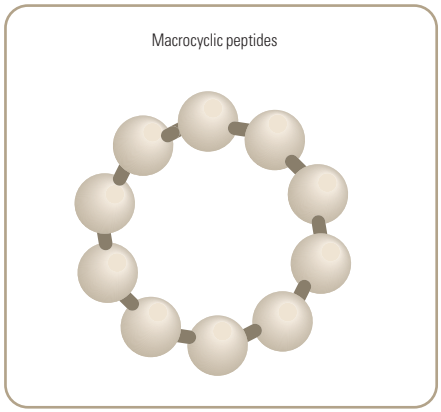
AnaSpec offers a versatile platform for synthesis of cyclic and constrained peptides including disulfide bridged peptides, N>C cyclizations, hydrocarbon stapling, and specialised modifications such as lactamations, etc. We also offer a selection of cyclic catalog peptides for your research needs. ■

## BENEFITS

- Enhanced conformational stability
- Mimicking secondary conformations

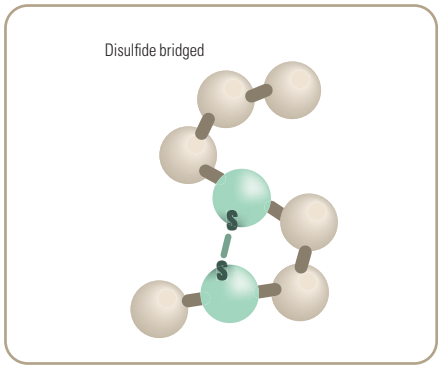
### Specifications for cyclic peptides

**Length:** 5-11 amino acids
**Type:** Head-to-Tail (N>C)
**Side Chain** to head or tail (N/C)
**Side Chain** to side chain
**Quantity:** 1-200mg
**Purity:** 90-95%



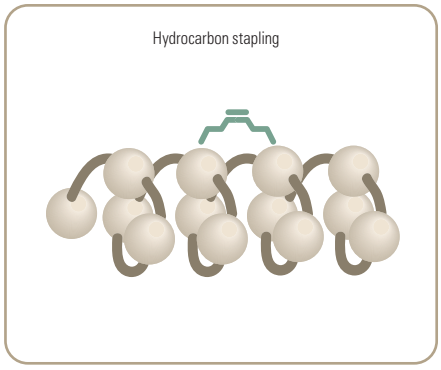

### Specifications for disulfide bridging

**Length:** 1-2 disulfides
3-5 disulfides formed naturally (thermodynamically stable)
**Quantity:** 1-200mg
**Purity:** 90-95%




### Specifications for stapling

**Location/turns:**
i, i+3, i+4, i+7 etc.
Single or double or triple turn stapling positions, as determined by customer
**Quantity:** 1-200/300mg
**Purity:** 90-95%




## POTENTIAL APPLICATIONS

- Stabilization of secondary conformations
- Improved binding affinity to targets
- Modulation/disruption of protein-protein interactions (PPI)
- Modulation/disruption of proteases
- Membrane permeability
- Metabolic stability & bioavailability
- Bioactivity
- Serve as structurally engineered models for designing drugs/probing disease mechanisms at target sites
- Generation and screening of libraries of disulfide-based macrocyclic ligands towards target affinities. *Eg.* RGD sequence motifs.

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# PEPTIDE LIBRARIES

Eurogentec offers custom peptide libraries, available with several modifications, in a 96-well plate format for high-throughput screening purpose. ■

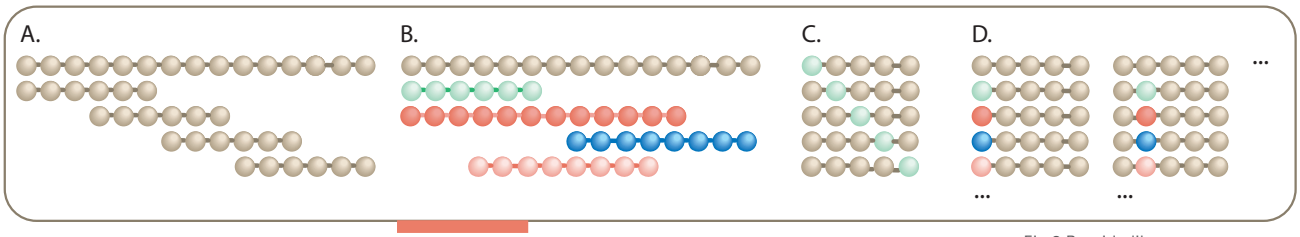


Fig 3 Peptide library type

A. **Overlapping peptide** sequences which are based on a larger protein sequence (peptide length and number of amino acid overlap must be provided).

B. **Unrelated peptides** of different lengths.

C. **Alanine scanning** where each amino acid position of the peptide is replaced with alanine.

D. **Degenerated Mix** where at position X, a mixture of amino acids is used for coupling (customer specifies amino acids and %). The resulting peptides are mixtures, therefore not purifiable.

## BENEFITS

- Superior technical design assistance upon request
- Peptide lengths as long as 22-mers
- Modifications such as fluorescent labeling or biotinylation
- Cost effective

## Specifications

**Quantity:** 200 - 500 µg of each peptide (up to 10 mg on request) - Minimum 24 peptides

**Format:** 96-well

**Type:** Unbound, free crude peptides - Amino N-terminus- $CONH_2$ C-terminus by default (COOH on request for additional fee)

**Length:** 5-22 amino acids

**QC validation:** MALDI-TOF QC on 10% of peptides

## APPLICATIONS

**Epitope mapping**
Epitopes recognized by antibodies are commonly 6 amino acids in length. By generating overlapping 15 mer peptides, each shifted by 4 amino acids, one can unequivocally determine which amino acids make up the epitope (fig. 3 A). Eurogentec proposes this service (see Epitope Mapping in the Eurogentec Antibodies brochure).

**T-Cell stimulation**
Libraries can also be generated to see which particular peptide from an antigenic protein is responsible for a T-cell response. The design process is similar to the epitope mapping example above.

**Alanine scanning**
By screening peptides with systematic replacement of each amino acid with alanine, one can determine to which extent a particular amino acid is required and sufficient for an interaction or an activity (fig 3 C).

**Amino Acid optimization**
By systematically replacing every amino acid position in a peptide with each possible amino acid, one can optimize the activity of a particular peptide sequence (fig 3 D).
- Protein-protein and protein-peptide interaction studies
- Kinase motif discovery
- Protease motif discovery
- Biological Assays

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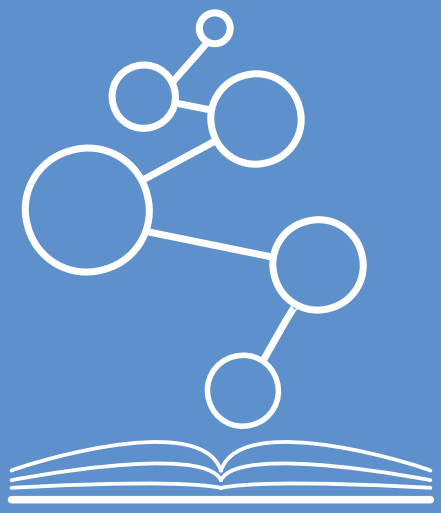
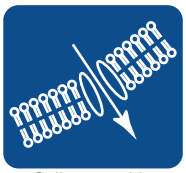


# AnaSpec Catalog peptides

Our catalog peptides represent over 20 years of innovative peptide synthesis expertise. AnaSpec is able to provide peptides in inventory and ready for immediate shipment.
Can't find a peptide? Request a Quote. ■

## PEPTIDE GROUPS BY RESEARCH TOPIC

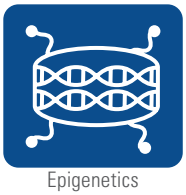

Neuroscience

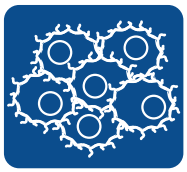

Cell permeable & Cell penetrating

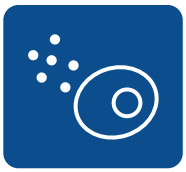

Cardiovassular


Host defense


Diabetes

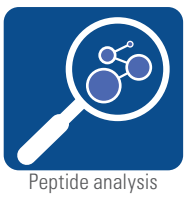

Epigenetics


Cancer and apoptosis


Peptide hormones


Cell adhesion & ECM


Signaling


Peptide analysis

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# NEUROSCIENCE

The role of peptides in the pathological states of brain tissue in the context of neurodegenerative diseases has sparked enormous interest in research and development, particularly with beta-amyloid peptides and Alzheimer's disease.

We are proud to feature the largest group of beta-amyloid peptides along with other peptides involved in neuroscience diseases such as Multiple Sclerosis, Parkinson's Disease, etc. Our neuroscience peptides also include opioïds and neuropeptides. Readily available to order, these peptides have been used by a large number of scientists and drug developers.

## SELECTION OF PEPTIDES

| PRODUCT & SEQUENCE | CAT. # |
|---|---|
| Beta-Amyloid (1-42)<br>DAEFRHDSGYEVHHQKLVFFAEDVGSNKGAIIGLMVGGVVIA | AS-20276 |
| Beta-Amyloid (1-42), HiLyte™ Fluor 488-labeled<br>HiLyte™ Fluor 488-DAEFRHDSGYEVHHQK<br>LVFFAEDVGSNKGAIIGLMVGGVVIA | AS-60479-01 |
| beta-Amyloid (1-42), HiLyte™ Fluor647-labeled<br>HiLyte™ Fluor 647-DAEFRHDSGYEVHHQKLVFFAEDV<br>GSNKGAIIGLMVGGVVIA | AS-64161 |
| Beta-Amyloid (1-42), HiLyte™ Fluor 555-labeled<br>HiLyte Fluor™ 555-DAEFRHDSGYEVHHQKLVFFAEDVGSNK<br>GAIIGLMVGGVVIA | AS-60480-01 |
| Beta-Amyloid (1-42) • HFIP<br>DAEFRHDSGYEVHHQKLVFFAEDVGSNKGAIIGLMVGGVVIA | AS-64129-1 |
| Biotin-beta-Amyloid (1-42)<br>Biotin-DAEFRHDSGYEVHHQKLVFFAEDVGSNKGAIIGLMVGGVVIA | AS-23524-01 |
| Beta-Amyloid (1-40)<br>DAEFRHDSGYEVHHQKLVFFAEDVGSNKGAIIGLMVGGVV | AS-24236 |
| Beta-Amyloid (1-40)-Lys(Biotin-LC)<br>DAEFRHDSGYEVHHQKLVFFAEDVGSNKGAIIGLMVGGVV-K(Biotin-LC) | AS-23517 |
| Cys-beta-Amyloid (1-40)<br>CDAEFRHDSGYEVHHQKLVFFAEDVGSNKGAIIGLMVGGVV | AS-23520 |
| Beta-Amyloid (1-40), HiLyte™ Fluor 488-labeled<br>HiLyte™ Fluor 488-DAEFRHDSGYEVHHQKLVFFAED<br>VGSNKGAIIGLMVGGVV | AS-60491-01 |
| Beta-Amyloid (1-40), HiLyte™ Fluor 555-labeled<br>HiLyte™ Fluor 555-DAEFRHDSGYEVHHQKLVFFAEDVGSNK<br>GAIIGLMVGGVV | AS-60492-01 |
| Beta-Amyloid (1-40)-Lys(Biotin)-$NH_2$<br>DAEFRHDSGYEVHHQKLVFFAEDVGSNKGAIIGLMVGGVV-K(Biotin)-<br>$NH_2$ | AS-61483-05 |
| Beta-Amyloid (25-35)<br>GSNKGAIIGLM | AS-24228 |
| MOG (35-55), mouse, rat<br>MEVGWYRSPFSRVVHLYRNGK | AS-60130-1 |
| PLP (139-151)<br>HCLGKWLGHPDKF | AS-63912 |
| [Leu5]-Enkephalin<br>YGGFL | AS-24333 |
| Dynorphin A (1-17)<br>YGGFLRRIRPKLKWDNQ | AS-24297 |
| Galanin, human<br>GWTLNSAGYLLGPHAVGNHRSFSDKNGLTS | AS-22431 |
| Substance P<br>RPKPQQFFGLM-$NH_2$ | AS-24279 |
| Neuropeptide Y, human, rat<br>YPSKPDNPGEDAPAEDMARYYSALRHYINLITRQRY-$NH_2$ | AS-22464 |

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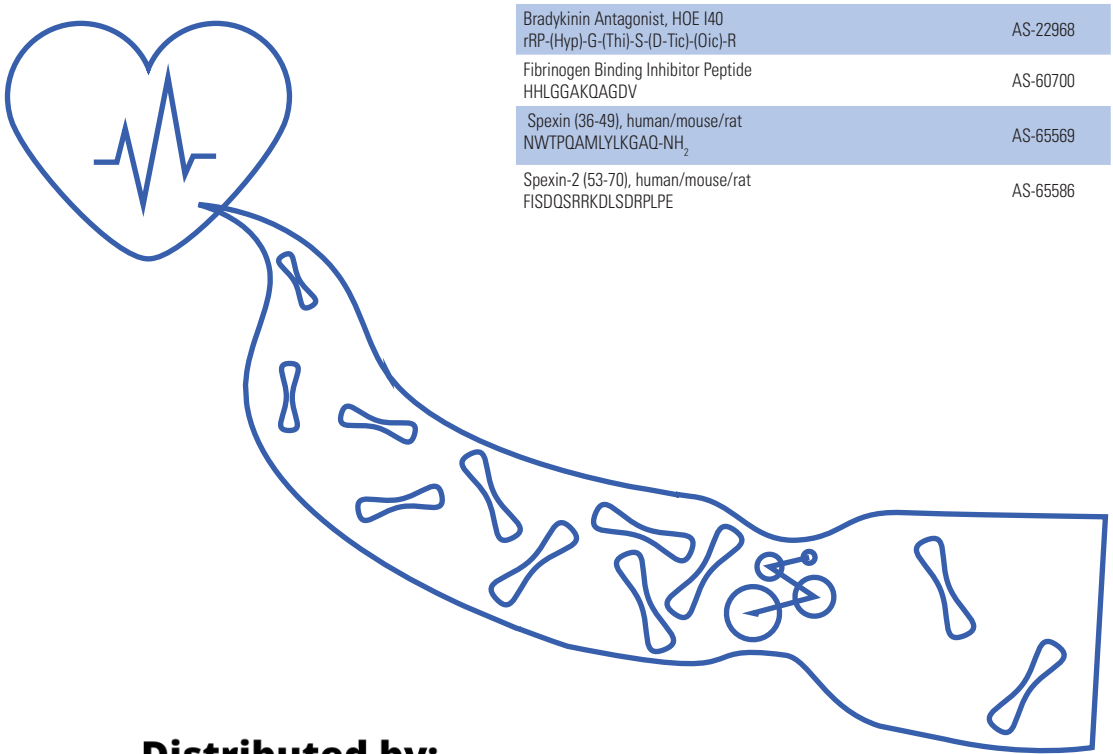
# CARDIOVASCULAR

The cardiovascular system, comprising of and regulated by a complex network of molecules, also includes unique peptide systems involved in the regulation of processes governing cardiac health. These peptides are known to play important roles specifically involving the two major pathways, the coagulation and the renin-angiotensin pathways that govern the cardiovascular system. Owing to certain structural motifs and properties, some of the peptides function as agonists while others function as antagonists. For example, some of the protease-activated receptors modulators act as agonists in mediating cellular effects of thrombin while others function as antagonists, thereby participating in the overall regulation of thrombosis and hemostasis.

AnaSpec is proud to feature multiple cardiovascular-related peptides readily available to order. ■

## SELECTION OF PEPTIDES

| PRODUCT & SEQUENCE | CAT. # |
|---|---|
| Atrial Natriuretic Peptide (1-28), rat<br>Sequence: SLRRSSCFGGRIDRIGAQSGLGCNSFRY<br>(Disulfide bridge: 7-23) | AS-20652 |
| B-type Natriuretic peptide (BNP-45), mouse<br>SQGSTLRVQQRPQNSKVTHISSCFGHKIDRIGSVSRLGCNALKLL<br>(Disulfide bridge:23-39) | AS-61152 |
| Endothelin 3, human, rat, mouse, rabbit<br>CTCFTYKDKECVYYCHLDIIW<br>(Disulfide bridge: 1-15 and 3-11) | AS-24323 |
| Angiotensin II, human<br>DRVYIHPF | AS-20634 |
| Protease-Activated Receptor-1, PAR-1 Agonist<br>TFLLRN | AS-61530 |
| Protease-Activated Receptor-4, PAR-4 Agonist 3, amide, murine<br>GYPGKF-$NH_2$ | AS-60778 |
| ADAMTS-13 FRET Substrate, FRETS-VWF73<br>DRE-Dap(Nma)-APNLVYMVTG-Dap(Dnp)-PASDEIKRLPGDIQVVPIGVGP<br>NANVQELERIGWPNAPILIQDFETLPREAPDLVLQR | AS-63728-05 |
| Thrombospondin (TSP-1) Inhibitor, LSKL<br>LSKL-$NH_2$ | AS-60877 |
| Thrombin Receptor Activator for Peptide 6 (TRAP-6)<br>SFLLRN | AS-24190 |
| Thrombin Substrate S2238<br>f-Pip-R-pNA | AS-63776 |
| Angiotensin I Converting Enzyme 2 (ACE-2) Inhibitor, DX 600<br>Ac-GDYSHCSPLRYYPWWKCTYPDPEGGG-$NH_2$ | AS-62337 |
| Renin 390 FRET Substrate I<br>R-E(EDANS)-IHPFHLVIHT-K(DABCYL)-R | AS-62022 |
| [Pyr1]-Apelin-13<br>Pyr-RPRLSHKGPMPF-OH | AS-60833 |
| Bradykinin Antagonist, HOE I40<br>rRP-(Hyp)-G-(Thi)-S-(D-Tic)-(Oic)-R | AS-22968 |
| Fibrinogen Binding Inhibitor Peptide<br>HHLGGAKQAGDV | AS-60700 |
| Spexin (36-49), human/mouse/rat<br>NWTPQAMLYLKGAQ-$NH_2$ | AS-65569 |
| Spexin-2 (53-70), human/mouse/rat<br>FISDQSRRKDLSDRPLPE | AS-65586 |



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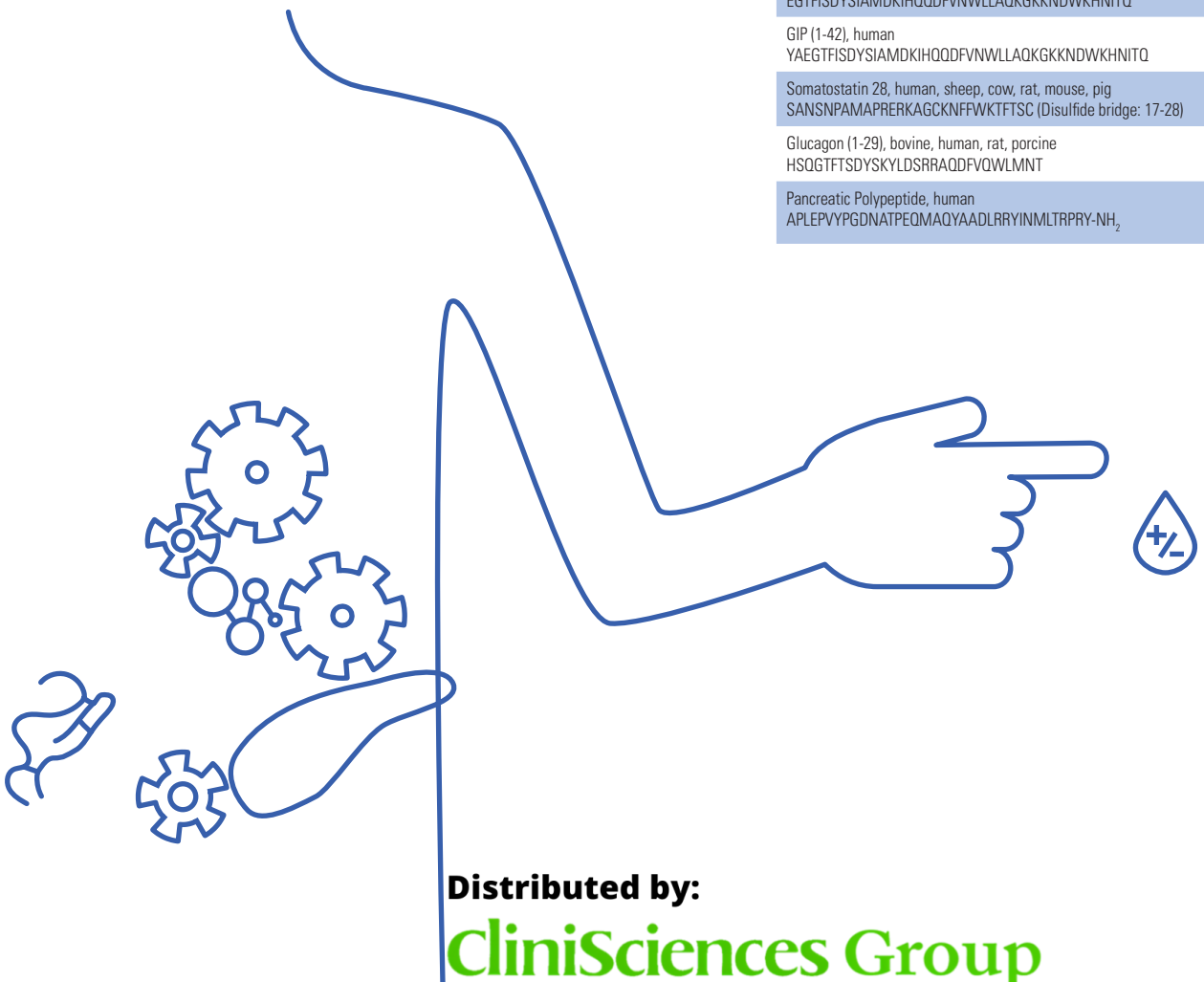
# DIABETES

Diabetes, a metabolic disease with increasing numbers of prevalence, has attracted much research attention in identifying key regulatory molecules geared towards its prevention and management. Peptides that are secreted in response to glucose stimulus and known to act on insulin-sensitive tissues have become important therapeutic targets for effecting insulin sensitiveness. Some of the key peptides involved in the regulation of glucose metabolism include C-peptide, Glucagon-like peptides and Exendins.

We are proud to feature a group of peptides specific to diabetes that are readily available to order. The diabetes group of peptides offered elicit important roles in glucose metabolism/modulation via insulin and non-insulin signaling pathways with therapeutic potentials.

## SELECTION OF PEPTIDES

| PRODUCT & SEQUENCE | CAT. # |
|---|---|
| Amylin (1-37), Islet Amyloid Polypeptide, IAPP, human<br>KCNTATCATQRLANFLVHSSNNFGAILSSTNVGSNTY<br>(Disulfide bridge: 2-7) | AS-60804 |
| Amylin (1-37), Islet Amyloid Polypeptide, IAPP, human, amide<br>KCNTATCATQRLANFLVHSSNNFGAILSSTNVGSNTY-NH2 (Disulfide bridge: 2-7) | AS-60254-1 |
| Amylin (1-37), human, amide, Biotin-labeled<br>Biotin-KCNTATCATQRLANFLVHSSNNFGAILSSTNVGSNTY-NH2<br>(disulfide bridge: 2-7) | AS-64451-05 |
| BDC2.5 Mimotope<br>RTRPLWVRME | AS-63774 |
| Insulin B (9-23)<br>SHLVEALYLVCGERG | AS-61532 |
| Exendin (9-39)<br>DLSKQMEEEAVRLFIEWLKNGGPSSGAPPPS-NH2 | AS-24468 |
| Exendin 4<br>HGEGTFTSDLSKQMEEEAVRLFIEWLKNGGPSSGAPPPS-NH2 | AS-24464 |
| Glucagon-Like Peptide 1, GLP-1 (9-36), amide, human, mouse, rat, bovine, guinea pig<br>EGTFTSDVSSYLEGQAAKEFIAWLVKGR-NH2 | AS-65070 |
| C-peptide (57-87), human<br>EAEDLQVGQVELGGGPGAGSLQPLALEGSLQ | AS-61127 |
| GIP (3-42), human<br>EGTFISDYSIAMDKIHQQDFVNWLLAQKGKKNDWKHNITQ | AS-61227 |
| GIP (1-42), human<br>YAEGTFISDYSIAMDKIHQQDFVNWLLAQKGKKNDWKHNITQ | AS-61226-1 |
| Somatostatin 28, human, sheep, cow, rat, mouse, pig<br>SANSNPAMAPRERKAGCKNFFWKTFTSC (Disulfide bridge: 17-28) | AS-22901 |
| Glucagon (1-29), bovine, human, rat, porcine<br>HSQGTFTSDYSKYLDSRRAQDFVQWLMNT | AS-22457 |
| Pancreatic Polypeptide, human<br>APLEPVYPGDNATPEQMAQYAADLRRYINMLTRPRY-$NH_2$ | AS-22866 |



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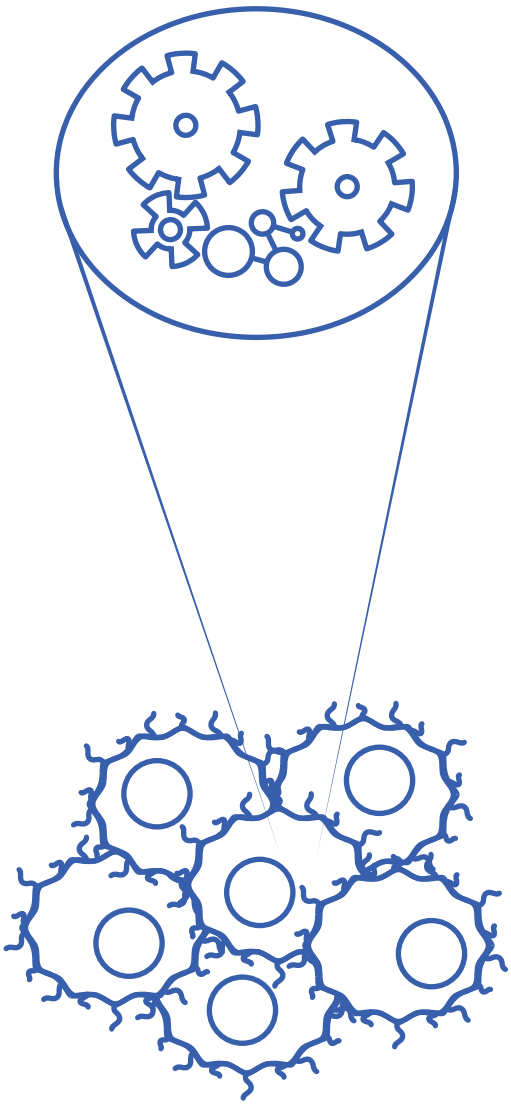
# CANCER AND APOPTOSIS

Peptides have been used as tools to study apoptosis, and also as important regulators of this process as seen in cancer and related diseases. Synthetic peptides that can target the apoptotic signal transduction cascades and/or function as pro-apoptotic agents bearing pharmaceutical potential are being developed. Cancer cells exhibit an elevated apoptotic threshold and peptides that are able to induce apoptosis in tumor cells are increasingly seen as promising candidates for the development of new effective anticancer therapeutics.

Here we offer a list of peptides that target oncogenic/angiogenic and apoptotic pathways/mechanisms. This group includes important sets of apoptotic peptides such as the caspases, which by virtue of their apoptotic nature play important roles in cancer. As other catalog peptides, these peptides are readily available to order, and continue to attract attention among cancer research scientists worldwide. ■



## SELECTION OF PEPTIDES

| PRODUCT & SEQUENCE | CAT. # |
|---|---|
| Kisspeptin-10 (Kp-10), Metastin (45-54), human<br>YNWNSFGLRF-$NH_2$ | AS-64240 |
| AH1 Sequence (6-14) murine leukemia virus MuLV<br>SPSYVYHQF | AS-64798 |
| Caspase 1 (ICE) Inhibitor II, biotinylated<br>Biotin-YVAD-CMK | AS-60841 |
| Caspase 3 (Apopain) Substrate 1m, fluorogenic<br>Ac-DEVD-AMC | AS-25262-5 |
| Caspase 8 Substrate 1, chromogenic<br>Ac-IETD-pNA | AS-25258-5 |
| Caspase 9 Substrate 1, chromogenic<br>Ac-LEHD-pNA | AS-25278-5 |
| gp100 (209-217)<br>IMDQVPFSV | AS-61277 |
| c-Myc peptide epitope<br>EQKLISEEDL | AS-24194 |
| TRP-2, Tyrosinase-related Protein 2 (180-188) SVYDFFVWL | AS-61058 |
| NY-ESO-1 (87-111)<br>LLEFYLAMPFATPMEAELARRSLAQ | AS-62655 |
| Bid BH3 (80-99)<br>EDIIRNIARHLAQVGDSMDR | AS-61711 |
| Bid BH3 (80-99), FAM labeled<br>5-FAM-EDIIRNIARHLAQVGDSMDR | AS-61712 |
| p53 (17-26), FITC labeled<br>FITC-LC-ETFSDLWKLL-$NH_2$ | AS-62386 |
| BAD (103-127), human<br>NLWAAQRYGRELRRMSDEFVDSFKK | AS-60984 |
| Bim BH3, Peptide IV<br>DMRPEIWIAQELRRIGDEFNAYYARR | AS-62279 |
| Human PD-L1 inhibitor I<br>FNWDYSWKSERLKEAYDL | AS-65581 |
| Human PD-L1 inhibitor II<br>FNWDYSLEELREKAKYK | AS-65582 |
| Human PD-L1 inhibitor III<br>TEKDYRHGNIRMKLAYDL | AS-65583 |
| Human PD-L1 inhibitor IV<br>GNWDYNSQRAQLYNQ | AS-65584 |
| Human PD-L1 inhibitor V<br>LDYVNRRKMYQ | AS-65585 |

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# CELL ADHESION AND ECM

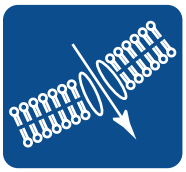
The group of peptides presented here are related to the extracellular matrix and regulation of adhesion. This group includes cyclic peptides that target the integrin receptors and modulate integrin function via cell communication and signal transduction, matrix metalloprotease substrates, etc.

As other catalog peptides, these peptides are readily available to order, and continue to attract wide applications for these cell adhesion peptides. ■

## SELECTION OF PEPTIDES

| PRODUCT & SEQUENCE | CAT. # |
|---|---|
| 520 MMP FRET Substrate III<br>QXL™ 520-PLGC(Me)HAr-K(5-FAM)-$NH_2$ | AS-60570-01 |
| 520 MMP FRET Substrate XV<br>QXL™ 520 -γ-Abu-PQGL-Dab(5-FAM)-AK-$NH_2$ | AS-60582-01 |
| 520 MMP FRET Substrate XIV<br>QXL™ 520 -γ-Abu-P-Cha-Abu-Smc-HA-Dab(5-FAM)-AK-NH2<br>(Smc=S-Methyl-L-cysteine) | AS-60581-01 |
| Cyclo (-RGDfC), avb3 Integrin Binding Cyclic RGD Peptide<br>Cyclo(-RGDfC) | AS-63785-1 |
| Integrin Binding Peptide<br>Ac-GCGYGRGDSPG-NH2 | AS-62349 |
| Vitronectin (367-378)<br>GKKQRFRHRNRKG | AS-65335 |
| Hyaluronan Inhibitor<br>GAHWQFNALTVR | AS-62622 |
| ADAMTS-4/Aggrecanase FRET Substrate, WAAG-3R<br>Abz-TEGEARGSVI-Dap(Dnp)-KK-$NH_2$ | AS-60431-1 |
| Cyclo (-RGDfK)<br>Cyclo(-RGDfK) | AS-61111 |
| Cyclo (-RGDyK)<br>Cyclo(-RGDyK) | AS-61183-5 |
| RGD-4C<br>ACDCRGDCFCG (Disulfide bridge: 2-10 and 4-8) | AS-29898 |
| GRGDSP<br>GRGDSP | AS-22946 |
| Cyclo-[GRGESP]<br>Cyclo-[GRGESP] | AS-64447 |

# CELL PERMEABLE AND CELL PENETRATING



Discover our specialized group of peptides related to cell permeation and cellular components. This group features peptides such as TAT, receptor targeting peptides, Arginine repeats, nuclear and mitochondrial membrane transporters, etc. TAT penetrates plasma membranes directly, not through endocytosis. (Arg)9 is a cell-permeable peptide used for drug delivery which can traverse the plasma membrane of eukaryotic cells. The Antennapedia homeodomain protein of drosophila can penetrate biological membranes, and the derived peptide (residues 43-58) retains this translocation property.

SV-40 T antigen peptide is used to translocate DNA molecules to the cell nucleus. Pep-1 is an amphipathic synthetic cell-penetrating peptide which has been successfully used to deliver a variety of proteins and other biopharmaceutical macromolecules into cells in a non-disruptive way. Buforin interacts with phospholipid bilayers and can be efficiently translocated across the layer with a weak membrane permeabilization activity. Cys(Npys) versions allow easy conjugation to the cargo molecules to be internalized.

These peptides are readily available to order, and continue to attract attention among scientists in drug discovery and research worldwide. ■

## SELECTION OF PEPTIDES

| PRODUCT & SEQUENCE | CAT. # |
|---|---|
| TAT (47-57)<br>YGRKKRRQRRR | AS-60023-5 |
| Cys(Npys)-TAT (47-57), FAM-labeled<br>C(Npys)YGRKKRRQRRR-K(FAM)-$NH_2$ | AS-61213 |
| Tat-C (48-57)<br>CGRKKRRQRRR | AS-62063 |
| TAT-HA2 Fusion Peptide<br>RRRQRRKKRGGDIMGEWGNEIFGAIAGFLG | AS-64876 |
| (Arg)9<br>RRRRRRRRR | AS-61204 |
| (Arg)9, FAM-labeled<br>FAM-RRRRRRRRR | AS-61207 |
| Cys(Npys)-(D-Arg)9<br>C(Npys)rrrrrrrrr-$NH_2$ | AS-61206 |
| Antennapedia Peptide, acid<br>RQIKIWFQNRRMKWKK | AS-61032 |
| Cys(Npys) Antennapedia Peptide, amide<br>C(Npys)-RQIKIWFQNRRMKWKK-$NH_2$ | AS-61034 |
| SV40 T-Ag-derived Nuclear Localization Signal (NLS) Peptide<br>PKKKRKVEDPYC | AS-63788 |
| Pep-1-Cysteamine<br>Ac-KETWWETWWTEWSQPKKKRKV-cysteamine | AS-63849 |
| Buforin<br>TRSSRAGLQFPVGRVHRLLRK | AS-61255 |
| Chimeric Rabies Virus Glycoprotein Fragment (RVG-9R)<br>YTIWMPENPRPGTPCDIFTNSRGKRASNGGGGRRRRRRRRR | AS-62565 |
| Penetratin<br>RQIKIWFQNRRMKWKKGG | AS-64885 |

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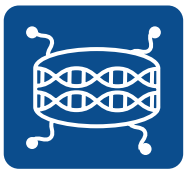
# HOST DEFENSE

This category presents a unique group of peptides including microbial peptides, antimicrobials, immune-, and inflammation-mediated peptides categorized exclusively as a 'host defense' catalog group of peptides. Readily available to order, the group features a unique combination of bacterial and viral peptides, antimicrobials like cathelicidins, immune-modulatory MHC-II and Ova peptides, and inflammation mediating cytokines involved in the study of several pathogen-mediated host defense mechanisms and studies involving characterization of immune/inflammatory processes in disease events.

## SELECTION OF PEPTIDES

| PRODUCT & SEQUENCE | CAT. # |
|---|---|
| LL-37, Antimicrobial Peptide, human<br>LLGDFFRKSKEKIGKEFKRIVQRIKDFLRNLVPRTES | AS-61302 |
| OVA (257-264)<br>SIINFEKL | AS-60193-1 |
| OVA (323-339)<br>ISQAVHAAHAEINEAGR | AS-27024 |
| Influenza HA (307-319)<br>PKYVKQNTLKLAT | AS-61028 |
| CEF20, Cytomegalovirus, CMV pp65 (495-503)<br>NLVPMVATV | AS-28328 |
| IL-8 Inhibitor<br>Ac-RRWWCR-NH2 | AS-62401 |
| Magainin 2<br>GIGKFLHSAKKFGKAFVGEIMNS | AS-20640 |
| mCRAMP, mouse<br>GLLRKGGEKIGEKLKKIGQKIKNFFQKLVPQPEQ | AS-61305 |
| C5a Receptor Agonist, mouse, human<br>FKP-(D-Cha)-Cha-r | AS-65121 |
| Protegrine-1 (PG-1), amide<br>RGGRLCYCRRRFCVCVGR-$NH_2$ (disulfide bridge:6-15 and 8-13) | AS-64819-1 |
| Indolicidin<br>ILPWKWPWWPWRR-$NH_2$ | AS-60999 |
| flg22, Flagellin Fragment<br>QRLSTGSRINSAKDDAAGLQIA | AS-62633 |
| Defensin HNP-1, Human Neutrophil Peptide-1<br>ACYCRIPACIAGERRYGTCIYQGRLWAFCC (Disulfide bridge: 2-30, 4-19, 9-29) | AS-60743 |
| hBD-3, beta-Defensin-3, human<br>GIINTLQKYYCRVRGGRCAVLSCLPKEEQIGKCSTRGRKCCRRKK (Disulfide bridge: 11-40, 18-33, 23-41) | AS-60741 |
| Gag Spacer Peptide P1<br>HHHHHHIIKIIK | AS-64773 |
| HIV Substrate, HiLyte Fluor™ 488<br>QXL™520-GABA-SQNYPIVQ-K(HiLyte Fluor™ 488)-$NH_2$ | AS-60635 |

# EPIGENETICS

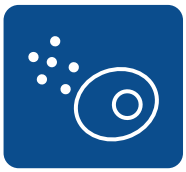


Our exclusive gene expression related histone peptides offer a wide selection to choose from. This special group includes important histone peptides and their covalent modifcations on the amino terminal end such as methylation, acetylation and phosphorylation as key structural players in chromatin assembly and gene expression. As with our other catalog peptides, these peptides are readily available to order.

## SELECTION OF PEPTIDES

| PRODUCT & SEQUENCE | CAT. # |
|---|---|
| Histone H3 (1-21)<br>ARTKQTARKSTGGKAPRKQLA | AS-61701 |
| Histone H3 (1-21)-GGK(Biotin)-$NH_2$<br>ARTKQTARKSTGGKAPRKQLA-GGK(Biotin)-$NH_2$ | AS-61702 |
| [Lys(Me1)4]-Histone H3 (1-21)-GGK(Biotin)<br>ART-K(Me1)-QTARKSTGGKAPRKQLA-GGK(Biotin) | AS-64355-1 |
| [Lys(Me2)4]-Histone H3 (1-21), H3K4(Me2)<br>ART-K(Me2)-QTARKSTGGKAPRKQLA | AS-63677 |
| [Lys(Ac)9]-Histone H3 (1-21), H3K9(Ac)<br>ARTKQTAR-K(Ac)-STGGKAPRKQLA | AS-64191 |
| [Lys(Ac)9]-Histone H3 (1-21)-GGK(Biotin)<br>ARTKQTAR-K(Ac)-STGGKAPRKQLA-GGK(Biotin) | AS-64361-1 |
| Histone H3 (21-44)<br>ATKAARKSAPATGGVKKPHRYRPG | AS-64454-1 |
| Histone H3 (21-44)-GK(Biotin)<br>ATKAARKSAPATGGVKKPHRYRPG-GK(Biotin) | AS-64440-1 |
| [Lys(Me3)27]-Histone H3 (21-44)-GK(Biotin)<br>ATKAAR-K(Me3)-SAPATGGVKKPHRYRPG-GK(Biotin) | AS-64367-1 |
| Histone H4 (1-21), p300/CBP Substrate<br>SGRGKGGKGLGKGGAKRHRKV | AS-62499 |
| Histone H4 (1-21)-GGK(Biotin)<br>Ac-SGRGKGGKGLGKGGAKRHRKV-GGK(Biotin) | AS-62555 |
| [Lys(Ac)5/8/12/16]-Histone H4 (1-21)-GGK(Biotin)<br>SGRG-K(Ac)-GG-K(Ac)-GLG-K(Ac)-GGA-K(Ac)-RHRKV-GGK(Biotin) | AS-64989-1 |
| Histone H4 (1-25)-GSGSK(Biotin)<br>SGRGKGGKGLGKGGAKRHRKVLRDN-GSGSK(Biotin) | AS-65242-1 |

# PEPTIDE HORMONES

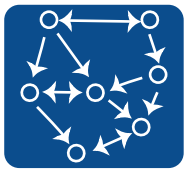


We offer a comprehensive list of important peptide hormones that are active at a physiological level and target specific organs and systems. The catalog group of peptide hormones includes hormones acting on the hypothalamus-pituitary axis, endocrine system, gastrointestinal tract etc. These highly popular peptides related to physiology are readily available to order, and have supported both basic and applied research.

## ORDERING INFORMATION

| PRODUCT & SEQUENCE | CAT. # |
|---|---|
| PACAP (1-27), amide, human, ovine, rat<br>HSDGIFTDSYSRYRKQMAVKKYLAAVL-$NH_2$ | AS-22527 |
| Oxytocin<br>CYIQNCPLG-$NH_2$ (Disulfide bridge: 1-6) | AS-24276 |
| Peptide YY, human<br>YPIKPEAPGEDASPEELNRYYASLRHYLNLVTRQRY-$NH_2$ | AS-24401 |
| Cholecystokinin (26-33), CCK Octapeptide, sulfated CCK-8<br>D-Y(SO3H)-MGWMDF-$NH_2$ | AS-20741 |
| [Des-octanoyl]-Ghrelin, human<br>GSSFLSPEHQRVQQRKESKKPPAKLQPR | AS-61177 |
| ACTH (1-39), human<br>SYSMEHFRWGKPVGKKRRPVKVYPNGAEDESAEAFPLEF | AS-20611 |
| Leptin (93-105), human<br>NVIQISNDLENLR | AS-62853 |
| Gastrin-1, human<br>Pyr-GPWLEEEEEAYGWMDF-$NH_2$ | AS-20750 |

# SIGNALING



This catalog peptide category comprises a comprehensive listing of signaling peptides under an exclusive catalog grouping. This group includes a vast array of kinase substrate libraries, kinase/phosphatase substrates, ion channel modulators etc, unique to several signaling pathways and signal transduction mechanisms involved in normal physiology and disease. These peptides are readily available to order, and continue to attract wide applications.

## ORDERING INFORMATION

| PRODUCT & SEQUENCE | CAT. # |
|---|---|
| Kinase Substrates Library, Group I, biotinylated, 180 distinct peptide mixtures | AS-62017-1 |
| Kinase Substrates Library, Group II, biotinylated, 18 distinct peptide mixtures | AS-62335 |
| CDK7/9 tide<br>YSPTSPSYSPTSPSYSPTSPSKKKK | AS-63367 |
| Kemptide [LRRASLG]<br>LRRASLG | AS-22594 |
| Myristolated PKC Zeta, Pseudosubstrate (ZIP)<br>Myr-SIYRRGARRWRKL | AS-63361 |
| Autocamtide-2-Related Inhibitory Peptide (AIP); CaMKII Inhibitor, myristoylated<br>Myr-KKALRRQEAVDAL | AS-64929 |
| Casein Kinase 2 (CK2) Substrate alpha-subunit [RRRDDDSDDD]<br>RRRDDDSDDD | AS-60615 |
| Srctide [GEEPLYWSFPAKKK-NH2]<br>GEEPLYWSFPAKKK-NH2 | AS-64105 |
| CK1 Peptide Substrate [pS7] [KRRRAL-pS-VASLPGL]<br>KRRRAL-pS-VASLPGL | AS-63797 |
| Protein Kinase Cepsilon Peptide Substrate [ERMRPRKRQGSVRRRV]<br>ERMRPRKRQGSVRRRV | AS-27183 |
| AMARA peptide<br>AMARAASAAALARRR | AS-62596 |
| Tyrosine Kinase Peptide 3 [RRLIEDAE-pY-AARG], Phosphorylated<br>RRLIEDAE-pY-AARG | AS-24546 |
| Insulin Receptor (1142-1153), pTyr(1146, 1150, 1151)<br>TRDI-pY-ETD-pY-pY-RK | AS-20272 |
| Caloxin 1b1<br>TAWSEVLHLLSRGGG | AS-64236 |
| Iberiotoxin (IbTX)<br>Pyr-FTDVDCSVSKECWSVCKDLFGVDRGKCMGKKCRCYQ(Disulfide bridge: C7-C28,C13-C33,C17-C35) | AS-60763 |

# PEPTIDE ANALYSIS

Our peptides for analysis purposes include mass spectroscopy standards, epitope tags, phosphopeptide standards, and dipeptide libraries. The peptide MS standards consists of 2 MS calibration mixtures (800 to 3800 Da); the phosphopeptide MS standard is a mix of 6 phosphorylated peptides.
The dipeptide library is composed of dipeptides to be chosen among a selection for your application. These peptides are grouped under 'peptide analysis' for ease of selection and ordering. They are also readily available to order.

## ORDERING INFORMATION

| PRODUCT & SEQUENCE | CAT. # |
|---|---|
| HA Tag<br>YPYDVPDYA | AS-21156 |
| 3 x Hemagglutinin (HA) Tag<br>MEYPYDVPDYAAEYPYDVPDYAAEYPYDVPDYAAKLE | AS-63764 |
| DYKDDDDK Tag<br>DYKDDDDK | AS-60738 |
| His Tag<br>HHHHHH | AS-24420 |
| Glu-Glu epitope Tag<br>EYMPME | AS-62189 |
| Rhodopsin Epitope Tag<br>TETSQVAPA | AS-62190 |
| V5 Epitope Tag<br>GKPIPNPLLGLDST | AS-61176 |
| [Glu1]-Fibrinopeptide B MS standard<br>EGVNDNEEGFFSAR | AS-60501-1 |
| Peptide Mass Spec Standards | AS-60882 |
| Phosphopeptide Mass Spec Standards | AS-61145 |
| ClearPoint™ BSA (347-359), Isotopic labeled, Mass Spec Standard<br>DAF-L*-GSF-L*-YEYSR [L* = L(U13C6, 15N)] | AS-61220 |
| Bovine ß-Casein, monophosphopeptide standard for MS and IC<br>FQ-pS-EEQQQTEDELQDK | AS-61146 |
| Dipeptide Library | AS-65126-336 |

# ANNEXES

## TECHNICAL INFO AND FAQs

### Is there a length limitation for custom peptides?

Typical lengths are 2 to 60 amino acids long. Longer peptides are possible, but they are sequence dependent and must be assessed carefully.

### What type of counter-ion should I request?

Default is TFA (Trifluoroacetic acid), but if working with cells or animals, you may prefer an acetate or HCl salt counter-ion (for additional fee).

### How do I calculate molarity of my catalog or custom peptide?

Molarity refers to the molar concentration of a solution, which is the number of moles of solute dissolved in 1 liter of solution, expressed as mol/L, or M.
Molarity [M] = Mass / (Volume x Molar Mass); Mole = Concentration (g/L) x Volume (L)/MW (g/mol)

Example:
Given: 1mg of dry peptide powder with MW: 20KDa (Molar mass of peptide is 20 g/mol)
To determine molarity with known mass and known volume
For a 1ml solution of this peptide:
Molarity = Mass (0.001g) / (volume (0.001L) x Molar Mass (MW 20,000) = 50µM

To determine mass to achieve a certain molarity:
If for your assay, you need 0.01mM working peptide solution in 1ml of water, then calculate mass required as follows:
Mass = Molarity x Volume x Molar Mass
Mass = 0.01mM x (1/1000 L) x 20,000g/mol = 0.0002g
Hence, you will need 0.2mg/ml of peptide to have a working solution of 0.01mM.

### How should I store my peptide?

For long-term storage of peptides, lyophilization is highly recommended. Lyophilized peptides can be stored for years at temperatures of -20 °C or lower with little or no degradation. Peptides in solution are much less stable. Peptides are susceptible to degradation by bacteria so they should be dissolved in sterile, purified water.
As moisture will greatly reduce the long term stability of peptides, peptides should be allowed to equilibrate to room temperature in a dessicator before dispensing, thus avoiding exposure to moisture in the air which will condense on the peptide. Once dispensed, the tube should be gently purged with anhydrous nitrogen or argon, the container recapped, sealed with parafilm and stored at -20 °C.

In solution, some slow degradation reactions may take place, the rate of which will be sequence dependent:
- Peptides containing methionine, cysteine, or tryptophan residues can have limited storage time in solution due to oxidation. These peptides should be dissolved in oxygen-free solvents.
- Glutamine and asparagine can deamidate to Glu and Asp, respectively
- Cysteines can undergo oxidative cyclization to form Cys-Cys
- Charged residues (Asp, Glu, Lys, Arg, His) are hygroscopic (take up water + moisture)

To prevent the damage caused by repeated freezing and thawing of peptides, dissolving the amount needed for the immediate experiment and storage of the remaining peptide in solid form is recommended.

### How do I solubilize my peptide?

Peptide solubility characteristics vary strongly from one peptide to another. Residues such as Ala, Cys, Ile, Leu, Met, Phe, and Val will increase the chance of the peptide having solubility problems.
The best solvent to use will depend on the solubility properties of the peptide and solvent requirements of your assay. We recommend predicting the physical properties of the peptide, dissolving the peptide as a function of these physical properties and then adapting the solubility results experimentally.
In order to reconstitute the peptide, distilled water or a buffer solution should be utilized. Some peptides have low solubility in water and must be dissolved in other solvents such as 10% acetic acid for positively charged peptides or 10 % ammonium bicarbonate solution for negatively charged peptides. Other solvents that can be used for dissolving peptides are acetonitrile, DMSO, DMF, or isopropanol. Use the minimal amount of these non-aqueous solvents and add water or buffer to make up the desired volume. Always use pure solvent first, then dilute by adding water stepwise until you reach a solvent concentration compatible with your assay. After peptides are reconstituted, they should be used as soon as possible to avoid degradation in solution. Unused peptide should be aliquoted into single-use portions, relyophilized if possible, and stored at -20 °C. Repeated thawing and refreezing should be avoided.
For peptides that tend to aggregate (usually peptides containing cysteines), add 6 M urea, 6 M urea with 20 % acetic acid, or 6 M guanidine - HCl to the peptide, then proceed with the necessary dilutions. Please note that urea irreversibly alters the side chain of lysines. If this is to be avoided, use of guanidium chloride is advised.
A major problem associated with the dissolution of a peptide is secondary structure formation. This formation is likely to occur with all but the shortest of peptides and is even more pronounced in peptides containing multiple hydrophobic amino acid residues. Secondary structure formation can be promoted by salts.

# ADDITIONAL SERVICE

To avoid freeze-thaw cycles and increase your peptide's life-time we can deliver your peptides into aliquoted vials containing ready-to-use accurate quantity.
Our dispensing service guarantees a high vial to vial reproducibility and considerably reduces set-up time and peptide waste that may occur with manual pipeting. The dispensing service is in line with ISO15189 requirements and each production is performed under controlled environment to avoid contamination risks.

## DISPENSING

The dispensing service is in line with ISO15189 quality standards. Any size of routine assays to full kitting solutions can be produced with a very high reliability, reproducibility and accuracy. This process saves set-up time and reduces reagent wastage, while keeping format flexibility.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Custom antibodies

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