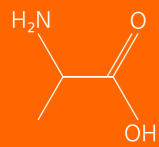
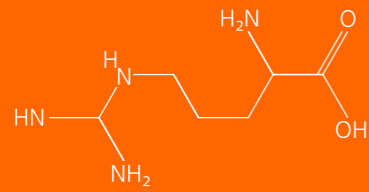


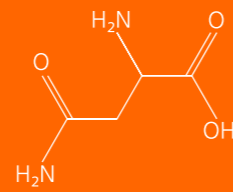
WHAT ARE PEPTIDES ?



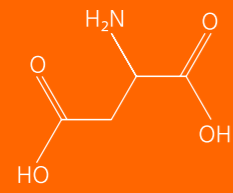
Ala - A



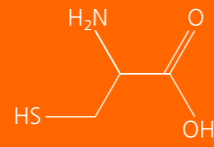
Arg - R



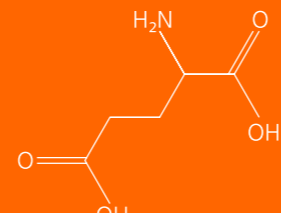
Asn - N



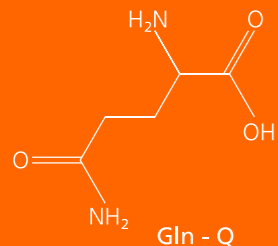
Asp - D



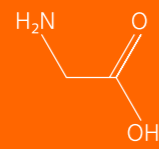
Cys - C



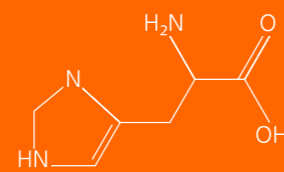
Glu - E



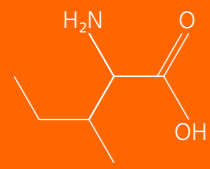
Gln - Q



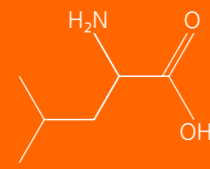
Gly - G



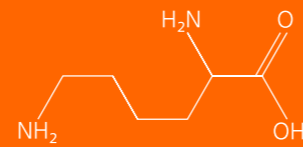
His - H



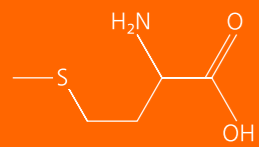
Ile - I



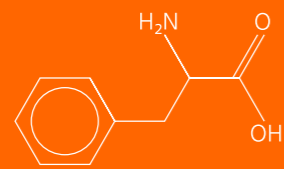
Leu - L



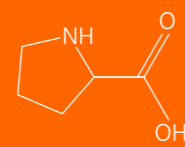
Lys - K



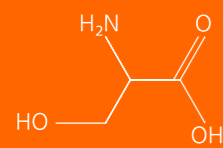
Met - M



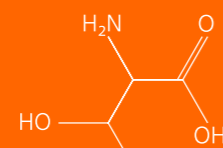
Phe - F



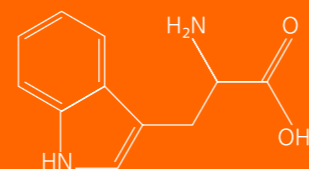
Pro - P



Ser - S

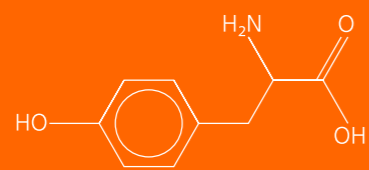


Thr - T

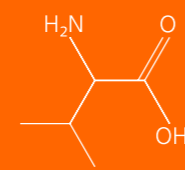


Trp - W

Peptides
are composed
of amino acids



Tyr - Y



Val - V

πεπτίδια

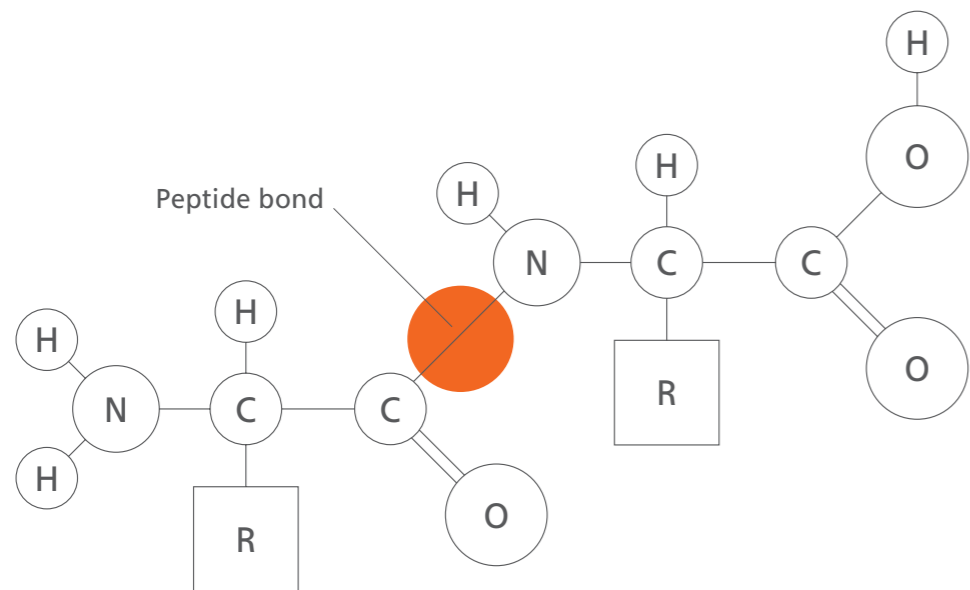
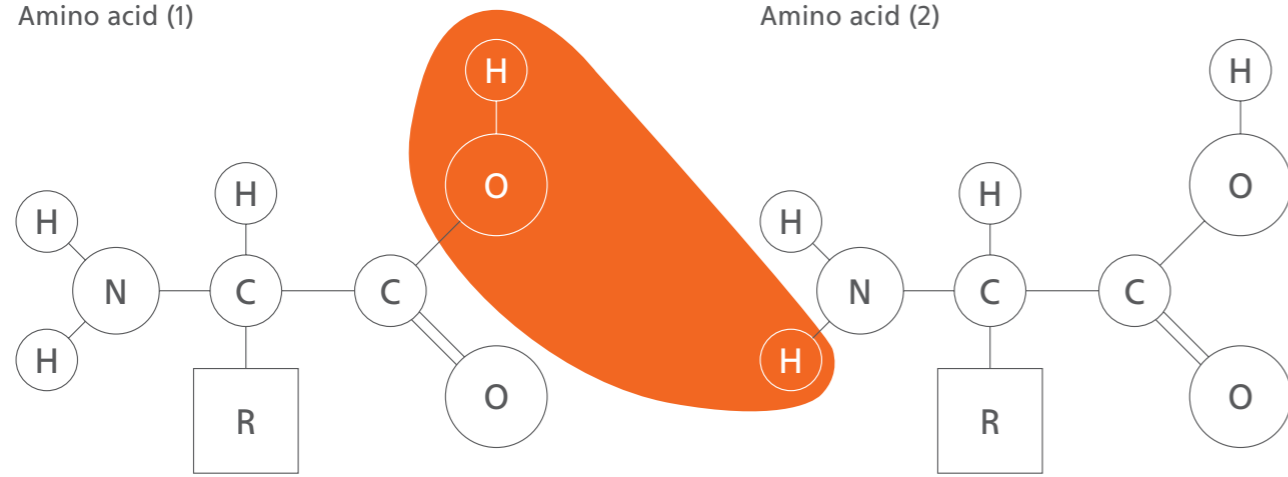


Peptides, from the "small digestibles", formed from the order, of α -amino amino acids are cells to biosynthesize are specified by the Peptides are

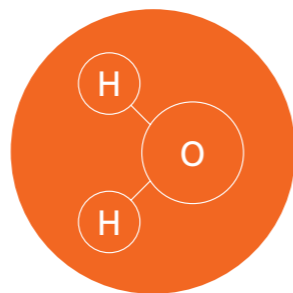
Greek πεπτίδια, are short polymers linking, in a defined acids. Twenty standard used by human peptides, and these general genetic code. products of human genes.

Amino acid (1)

Amino acid (2)



Dipeptide



Water

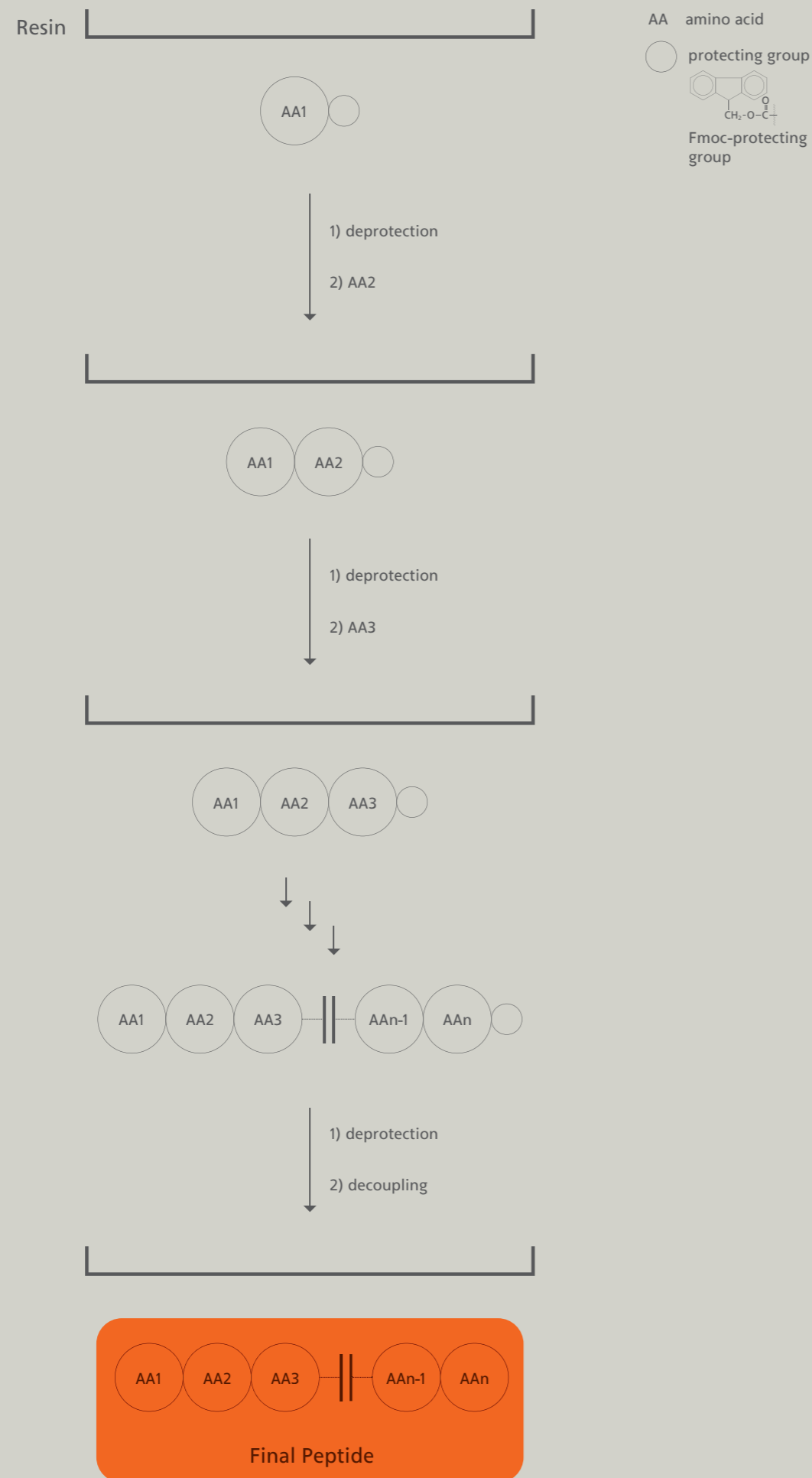
The condensation of two amino acids forms a peptide bond

Alpha-amino acids are the building blocks of peptides. Amino acids combine in a condensation reaction, that is, through dehydration synthesis, that releases water and the new "amino acid residue" that is held together by a peptide bond. Peptides are defined by their unique sequence of amino acid residues. Just as the letters of the alphabet can be combined to form an almost endless variety of words, amino acids can be linked in varying sequences to form a vast variety of peptides.

- **Mondobiotech's peptides are not products of cells or bacteria (they are not recombinant products).**
- **Our peptides are the synthetic versions (chemically produced) of the peptides discovered in our cells and bodies.**
- **Irrespective of the way of manufacturing or production, all peptides having the same primary sequence of amino acids exhibit the same biological functions.**

- **For regulatory reasons**
(synthetic peptides fall under the classification chemical entity and not under the classification recombinant products)
Mondobiotech works with synthetic peptides only.
-

- **However, this approach, which also guarantees to the patients a higher safety due to the applied manufacturing process, has its limitations.**
-
- **Currently, due to economic constrains in the production process, we do only consider peptides between 3 and 55 amino acids in length as drug candidates.**

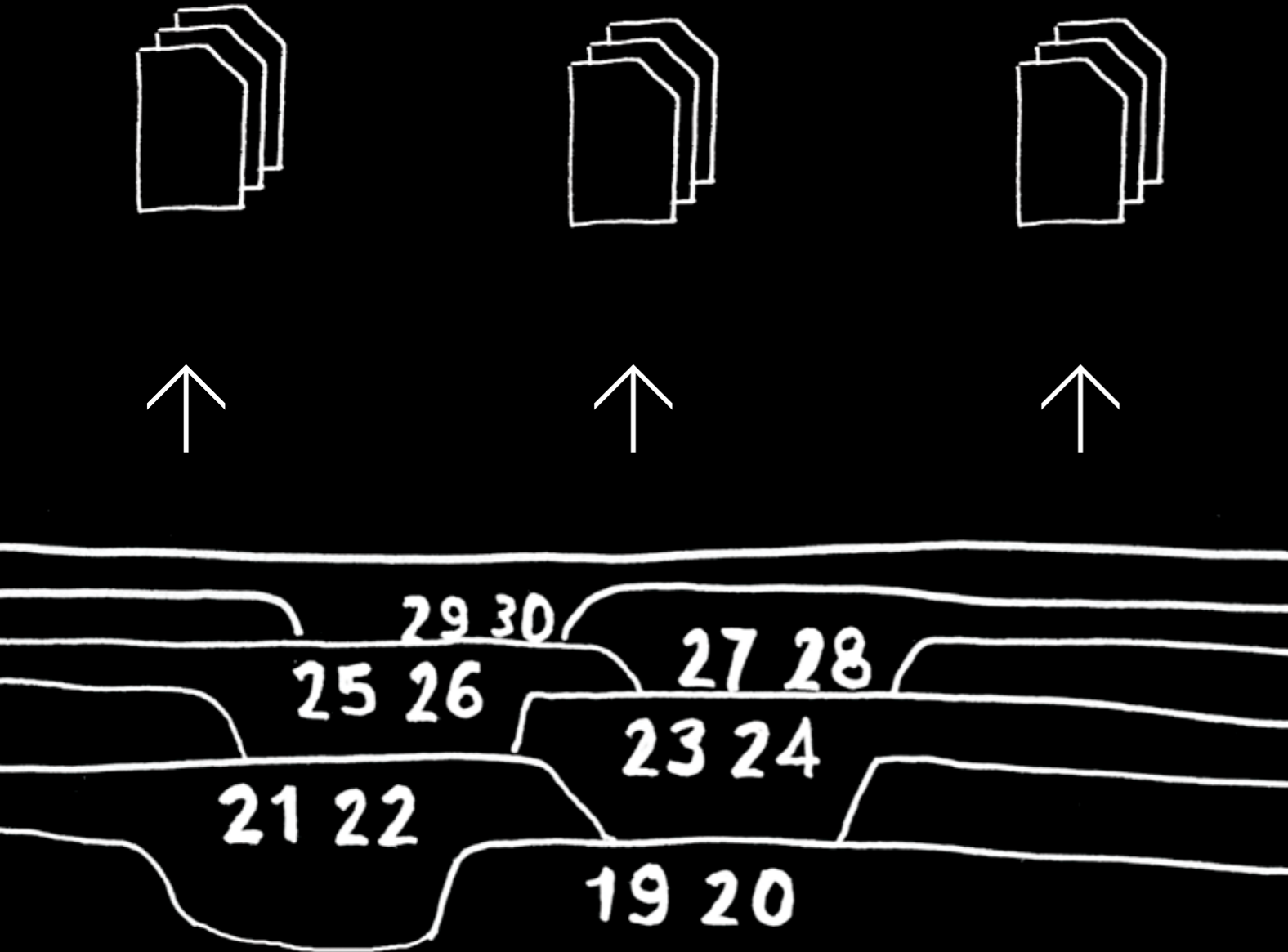


Technically speaking, most peptides are produced according to the solid phase peptide synthesis on a Merrifield resin, named after Bruce Merrifield.

(Nobel Prize in Chemistry 1984)

Mondobiotech does not develop New Chemical Entities.

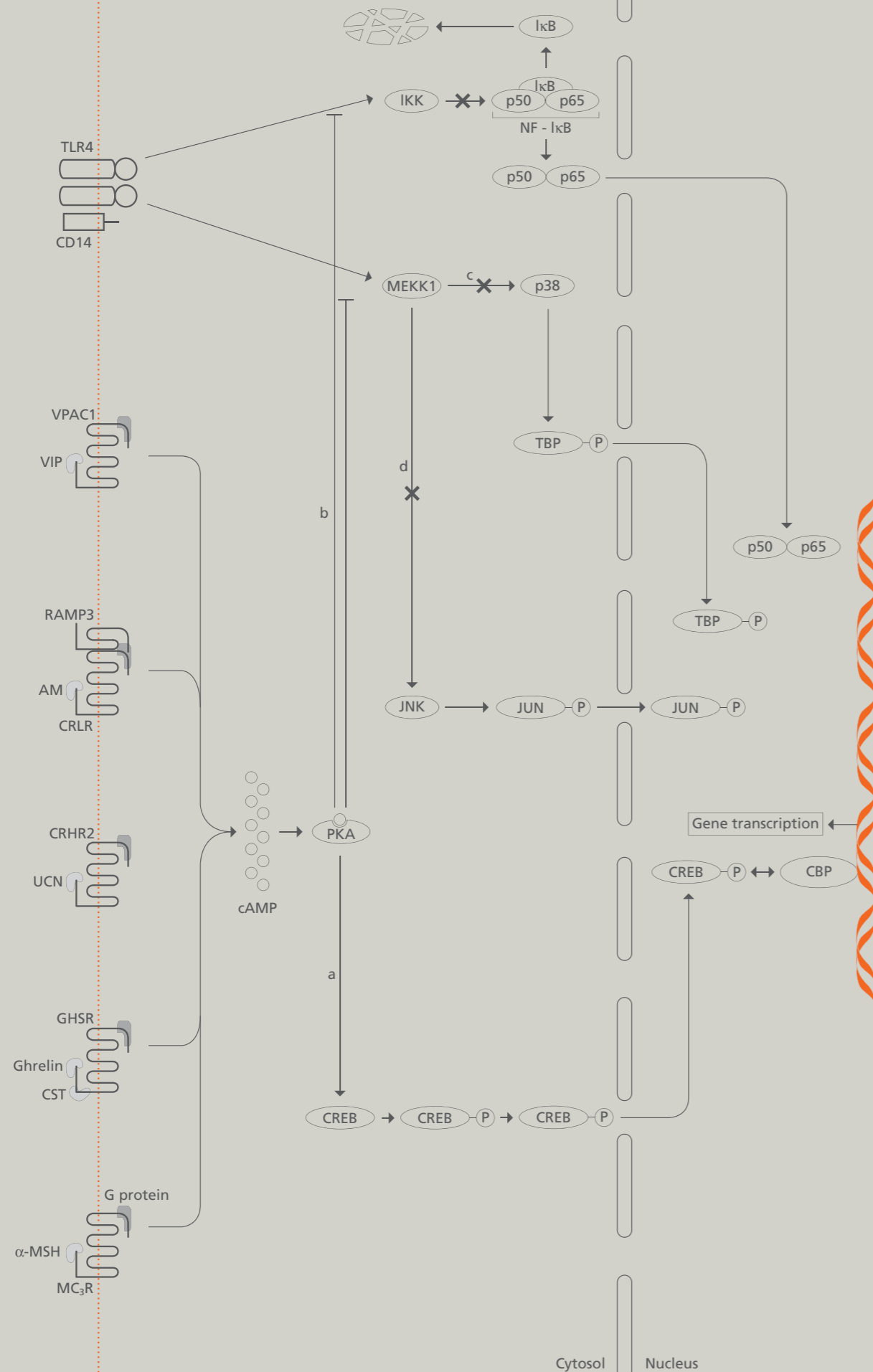
All our peptide products are known from peer-reviewed scientific literature.



From this scientific literature we know that these peptides are **bioactive**. (which means that these peptides exert active interactions or effects on cells of the animals or human body, or in the animals or human body)

In the meaning of Mondobiotech's scientific approach peptides have mainly two different modes of action:

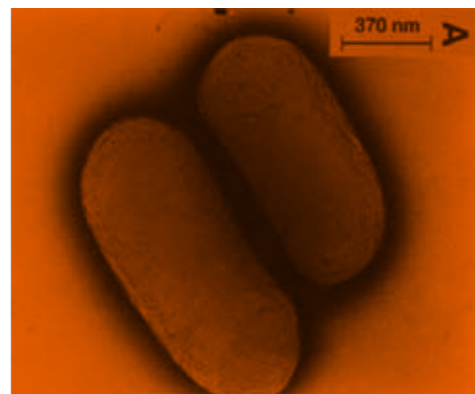
1 – peptide acts as a ligand or agonist (an agonist binds to a receptor of a cell and triggers a response by the cell; it produces an action, as opposed to an inhibitor, that blocks an action);



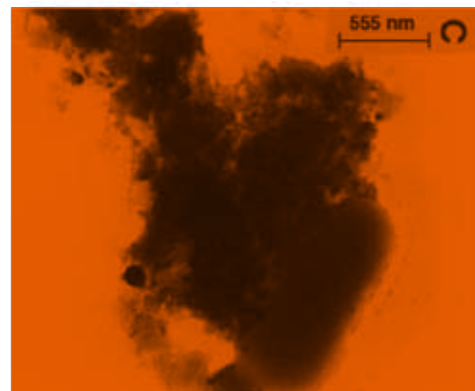
← Examples for bioactive peptides as ligands or agonists: α -MSH (alpha Melanocyte Stimulating Hormone), Ghrelin, Cortistatin (CST), Urocortin (UCN), Adrenomedullin (AM), Avipitadil (VIP).

2 – peptide acts independent of a receptor and produces a direct action

(e.g. antibacterial activity)



E.coli



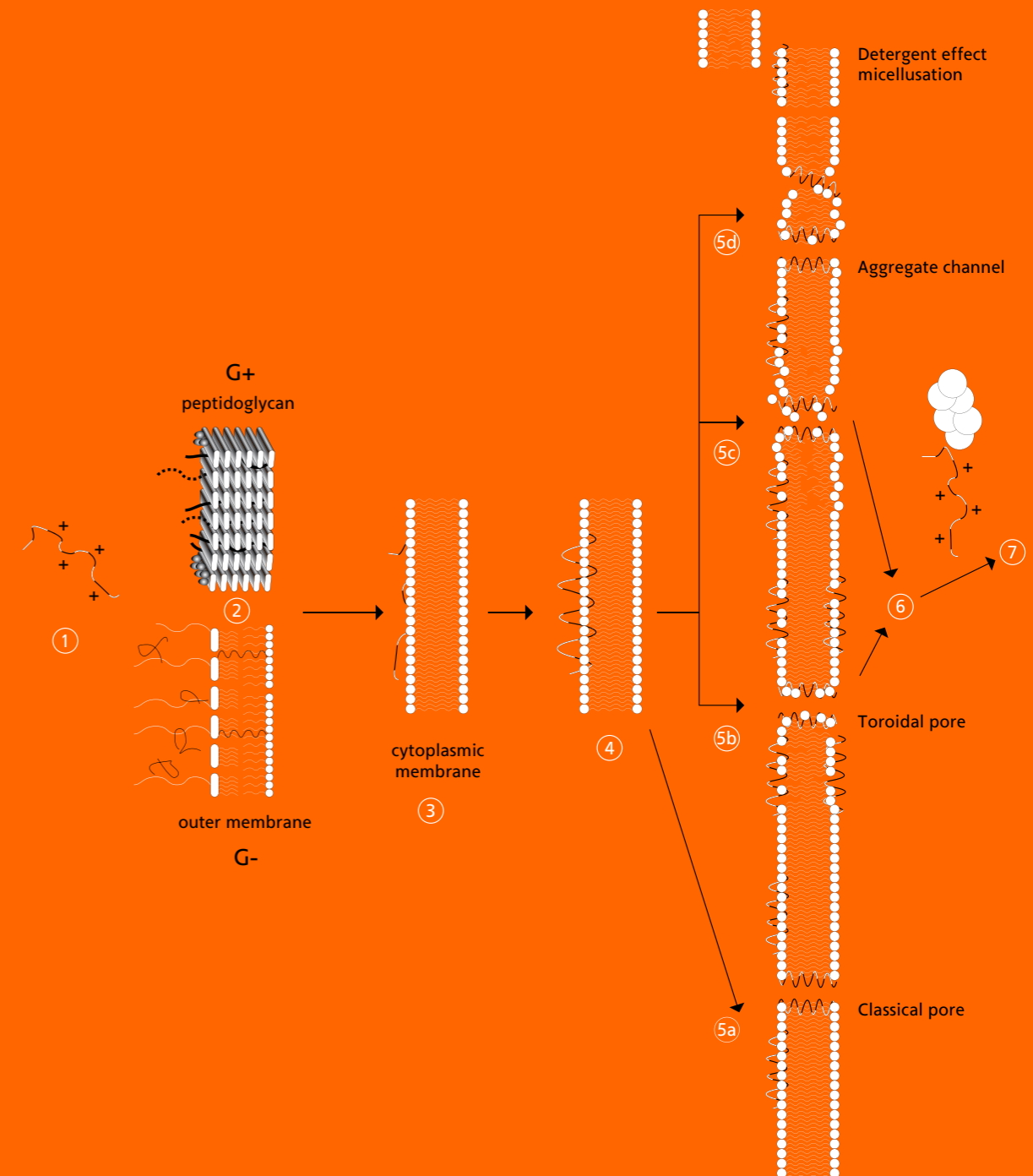
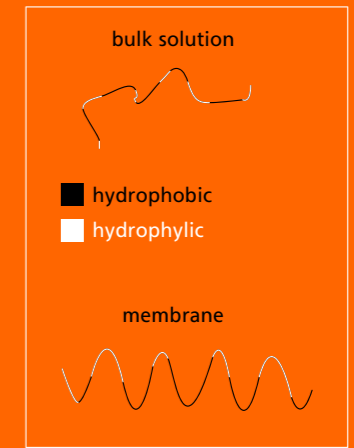
E.coli + LL-37

← ACTION

Examples of a non-receptor mediated activity of an antibacterial peptide LL-37 on the bacterium Escherichia coli (E.coli).

Mode of action of α -helical AMPs

- ① Cross outer layers of cell wall
- ② External target (e.g. autolysin release)
- ③ Assemble on surface of cytoplasmic membrane
- ④ Structure/aggregate/insert into lipid bilayer
- ⑤ Carpet mechanism
- ⑥ Translocation
- ⑦ Intracellular target



All of those bioactive peptides from scientific literature are commercially available products which mean that their production process is known and established, and repeatable at the same quality standards to allow biological testing.

However, reports on bioactive peptides are biased by the reporting authors; they usually describe just one or only few biological aspects of a peptide.

(due to interests, funding, and focused projects).

Mondobiotech has therefore applied to the selected peptides from scientific literature a second, industrial type of screening approach:

22  × 312

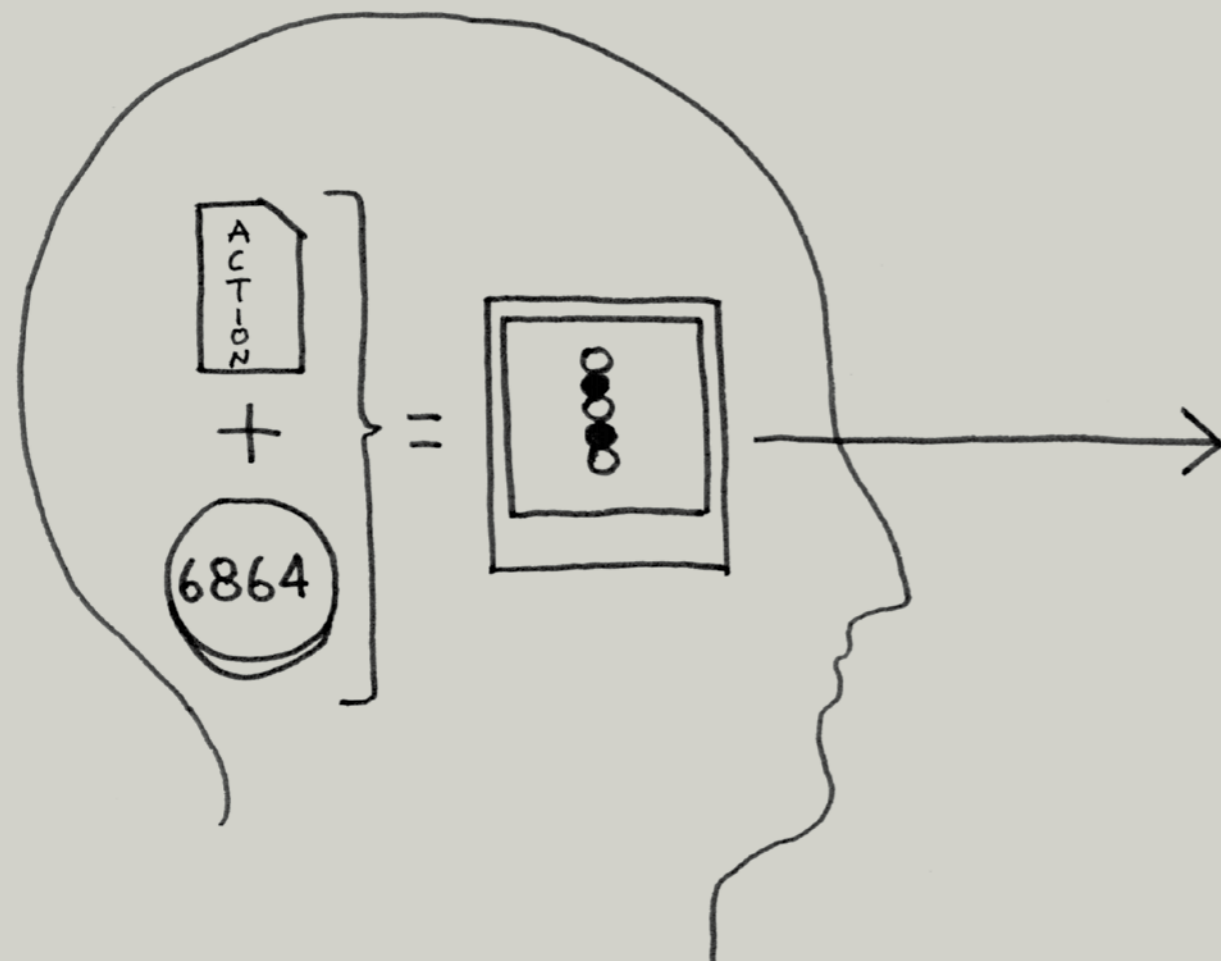
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6864

We have tested at the same time in parallel and randomly 312 bioactive peptides

in four antibacterial assay systems, three antiviral assay systems, two angiogenesis assay systems, two proliferation assay systems, six immunological assay systems, two apoptosis assay systems, one phagocytosis assay system, one second messenger assay system and one cell cycle assay system.

Combined with the already literature published data, we obtained a highly informative big picture of the additional bioactive features of the peptides, which have not been known to the public domain.



With these novel data generated, we filed for all of the tested peptides patent applications concerning the use of the respective peptides for preparation of a medicine to be administered to patients suffering from various different rare diseases.

In addition, we created a peptide product list of 312 products which can be explored in as many as possible of the more than 7000 rare diseases.

Safety of natural human peptides

Of particular note and very importantly, we believe that the vast majority of the selected peptides will have a highly beneficial safety profile for the patients.

Naturally existing peptides in the human body regulate cell interactions, communication and behavior within the organisms. They have been selected for millions of years for efficacy and safety and represent the Nature's compromise for the said features.

Almost every human being on this planet has been exposed to a majority of those peptides and our immune system therefore accepts them as "own".

Many peptides are main constituents of human milk – a nutriment necessary and sufficient to provide protection and all elements for growth of a baby.



Moreover, a significant number of our products have already been in clinical trials by others and for other indications and few of those peptides are already regulatory approved and on the market for other indications.

This means that for those peptides already very reasonable and favorable safety data exist, allowing fast exploitations in rare disease indications, too.

Glu-Ala-Glu-Asp-Leu-Gln-Val-Gly Gln-Val-Glu-Leu-Gly-Gly-Gly-Pro Gly-
Ala-Gly-Ser-Leu-Gln-Pro-Leu-Ala-Leu-Glu-Gly-Ser-Leu-Gln-OH
His-Ala-Glu-Gly-Thr-Phe-Thr-Ser-Asp-Val-Ser-Ser-Tyr-Leu-Glu-Gly-Gln-
Ala-Ala-Lys-Glu-Phe-Ile-Ala-Trp-Leu-Val-Lys-Gly-Arg-NH2
Pyr-His-Trp-Ser-Tyr-Gly-Leu-Arg-Pro-NHEt
Tyr-Gly-Gly-Phe-Met-Thr-Ser-Glu-Lys-Ser-Gln-Thr-Pro-Leu-Val-Thr-Leu-
Phe-Lys-Asn-Ala-Ile-Ile-Lys-Asn-Ala-Tyr
Gly-Arg-Gly-Asp-Asn-Pro-OH
Ser-Val-Ser-Glu-Ile-Gln-Leu-Met-His-Asn-Leu-Gly-Lys-His-Leu-Asn-Ser-
Met-Glu-Arg-Val-Glu-Trp-Leu-Arg-Lys-Lys-Leu-Gln-Asp-Val-His-Asn-Phe
His-Pro-Phe-His-Leu-D-Leu-Val-Tyr-OH
Ser-Arg-Thr-His-Arg-His-Ser-Met-Glu-Ile-Arg-Thr-Pro-Asp-Ile-Asn-Pro-
Ala-Trp-Tyr-Ala-Ser-Arg-Gly-Ile-Arg-Pro-Val-Gly-Arg-Phe-NH2
His-Ser-Leu-Gly-Lys-Trp-Leu-Gly-His-Pro-Asp-Lys-Phe
Pro-Gly-Thr-Cys-Glu-Ile-Cys-Ala-Tyr-Ala-Ala-Cys-Thr-Gly-Cys-OH
Pro-Ala-Leu-Pro-Glu-Asp-Gly-Gly-Ser-Gly-Ala-Phe-Pro-Pro-Gly-His-Phe-
Lys-Asp-Pro-Lys-Arg-Leu-Tyr
Cys-Tyr-Phe-Gln-Asn-Cys-Pro-Arg-Gly-NH2
Tyr-Ala-Glu-Gly-Thr-Phe-Ile-Ser-Asp-Tyr-Ser-Ile-Ala-Met-Asp-Lys-Ile-His-
Gln-Gln-Asp-Phe-Val-Asn-Trp-Leu-Leu-Ala-Gln-Lys-Gly-Lys-Lys-Asn-Asp-
Trp-Lys-His-Asn-Ile-Thr-Gln-OH
Tyr-Gly-Gly-Phe-Leu-Arg-Arg-Gln-Phe-Lys-Val-Val-Thr-OH
Ile-Pro-Ala-Pro-Gln-Gly-Ala-Val-Leu-Val-Gln-Arg-Glu-Lys-Asp-Leu-Pro-
Asn-Tyr-Asn-Trp-Asn-Ser-Phe-Gly-Leu-Arg-Phe-NH2
Ile-Val-Leu-Ser-Leu-Asp-Val-Pro-Ile-Gly-Leu-Leu-Gln-Ile-Leu-Leu-Glu-
Gln-Ala-Arg-Ala-Arg-Ala-Ala-Arg-Glu-Gln-Ala-Thr-Thr-Asn-Ala-Arg-Ile-
Leu-Ala-Arg-Val-Gly-His-Cys-NH2
Asn-Asp-Asp-Cys-Glu-Leu-Cys-Val-Asn-Val-Ala-Cys-Thr-Gly-Cys-Leu-OH
Thr-Thr-Ser-Gln-Val-Arg-Pro-Arg-OH
Ac-Pen-Arg-Gly-Asp-Cys-OH
Thr-Asp-Thr-Ser-His-His-Asp-Gln-Asp-His-Pro-Thr-Phe-Asn-OH
Pyr-His-Trp-Ser-Tyr-Trp-Leu-Arg-Pro-Gly-NH2
Pyr-His-Trp-Ser-Tyr-D-His(Bzl)-D-Leu-Arg-Pro-NHEt
Ac-Asp-D-Gla-Leu-Ile-b-cyclohexyl-Ala-Cys-OH
H-D-Phe-Cys-Phe-D-Trp-Lys-Thr-Cys-L-threoninol

Product list.



09/09/08 Berlin

Bestätigung über den Eingang *313* Dokumenten für Patentanmeldungen

EPO-BERLIN
- 9. SEP. 2008



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