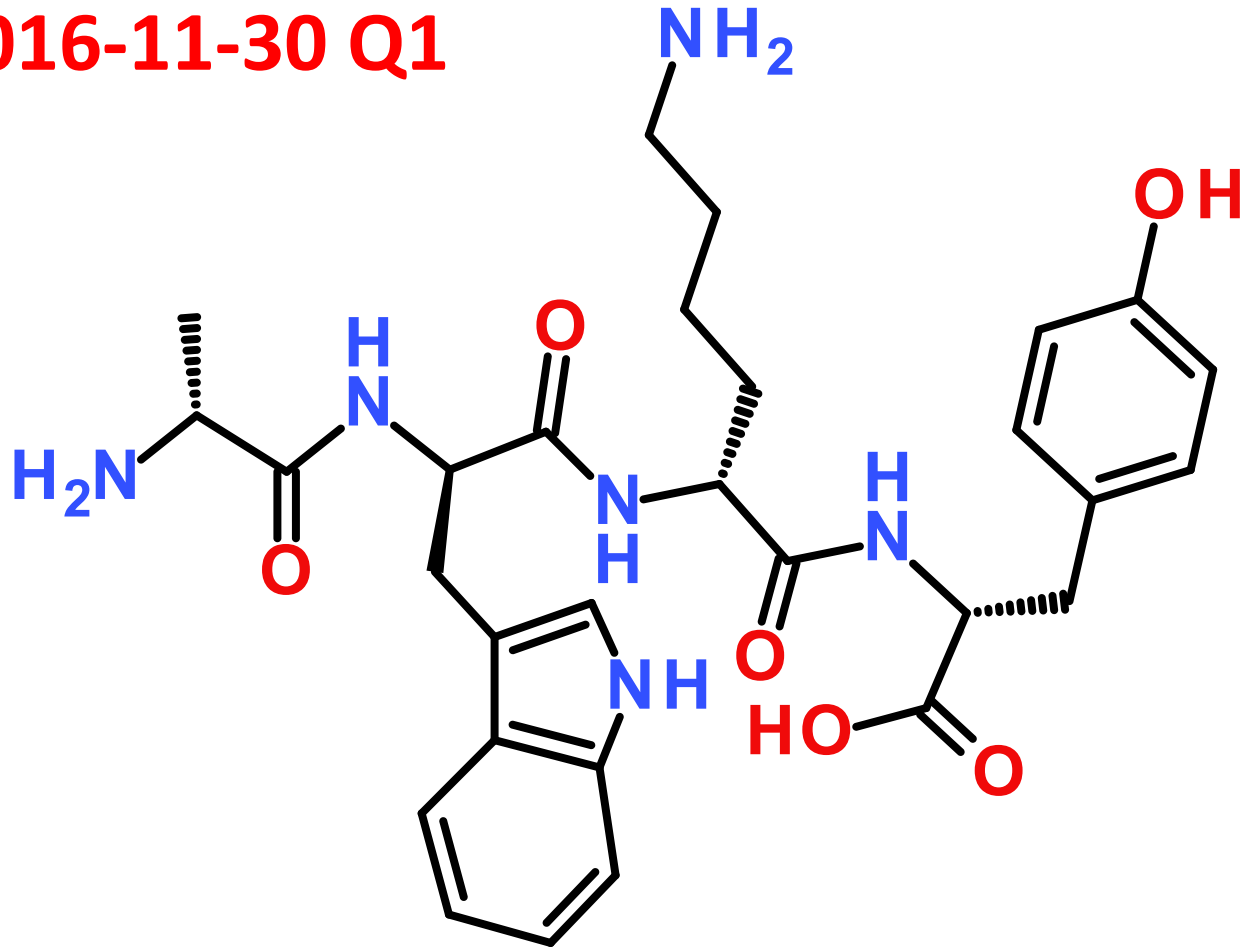


What is the total charge on this peptide at pH = 11?

- A. -3
- B. -2
- C. -1
- D. 0
- E. +1
- F. +2
- G. +3

2016-11-30 Q1



What is the total charge on this peptide at pH = 11?

A. -3

B. -2

C. -1

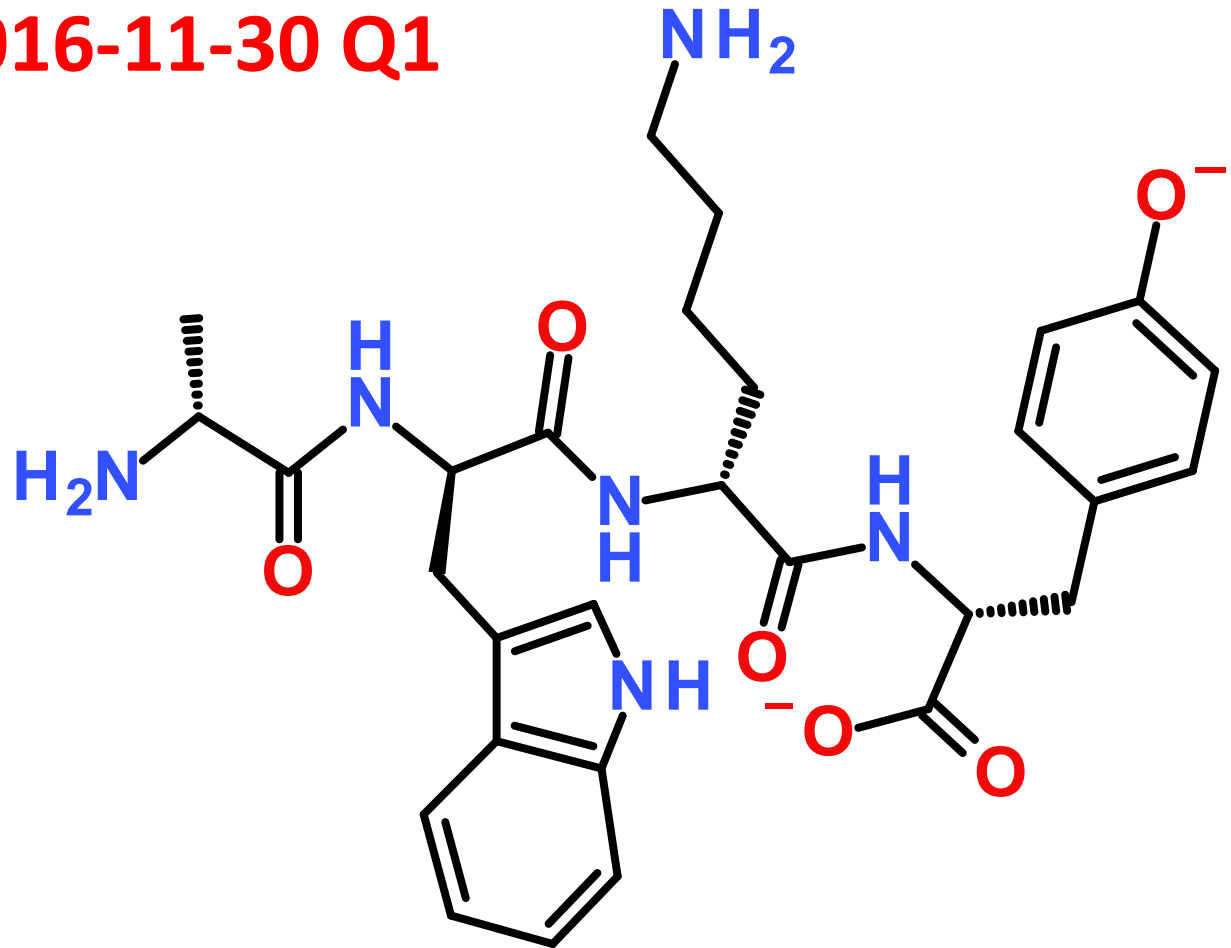
D. 0

E. +1

F. +2

G. +3

2016-11-30 Q1



Exam 4 (Cumulative Exam)

- **Time:**
 - Thursday, December 8: 2:00 – 4:00PM OR
 - Saturday, December 10: 10:00 am – Noon OR
 - Saturday, December 10: 1:00 – 4:00PM
- **Location – Soc/Anthro Testing Center**
 - Chapters will be covered in this order: Chapter 18, 19, 20
- **Practice Exams are Posted**
 - Ex4-90A Practice Final Exam
 - Ex4-90B Practice Final Exam
- **Deadline for alternate arrangements is Monday, 12/5/2016 at 4:30 PM (i.e., close of business)**
 - An oral make-up exam will be required for making up the exam for all students not taking the exam on the above dates or having already made prior arrangements

Assignment	Due Date
Ex4-01-B7-18-06B Claisen Condensation	Friday, November 11, 2016
Ex4-02-B7-18-06C Claisen Condensation	Saturday, November 12, 2016
Ex4-03-B7-18-08B A-B Unsaturated Rxns	Sunday, November 13, 2016
Ex4-04-B7-18-08C A-B Unsaturated Rxns	Monday, November 14, 2016
Ex4-05-B7-18-09A Carb Classification	Tuesday, November 15, 2016
Ex4-06-B7-19-01 Hemiacetal Formation	Wednesday, November 16, 2016
Ex4-07-B7-19-02 Carbohydrate Reactions	Thursday, November 17, 2016
Ex4-08-B7-19-02 Kiliani-Fischer Synthesis	Friday, November 18, 2016
Ex4-09-B7-19-03 Important Carbohydrates	Monday, November 28, 2016
Ex4-10-B7-19-04 Carbs in Blood Types	Monday, November 28, 2016
Thanksgiving Break	
Ex4-11-B7-20-01 Amino Acid Nomenclature	Tuesday, November 29, 2016
Ex4-12-B7-20-01B Amino Acid Naming	Wednesday, November 30, 2016
Ex4-13-B7-20-02 Amino Acid Acid Base	Thursday, December 1, 2016
Ex4-14-B7-20-03 Edmann Degradation	Friday, December 2, 2016
Ex4-15-B7-20-04 Modified Peptide Synthesis	Saturday, December 3, 2016
Ex4-16-B7-20-05 Synthesis in Peptides	Sunday, December 4, 2016

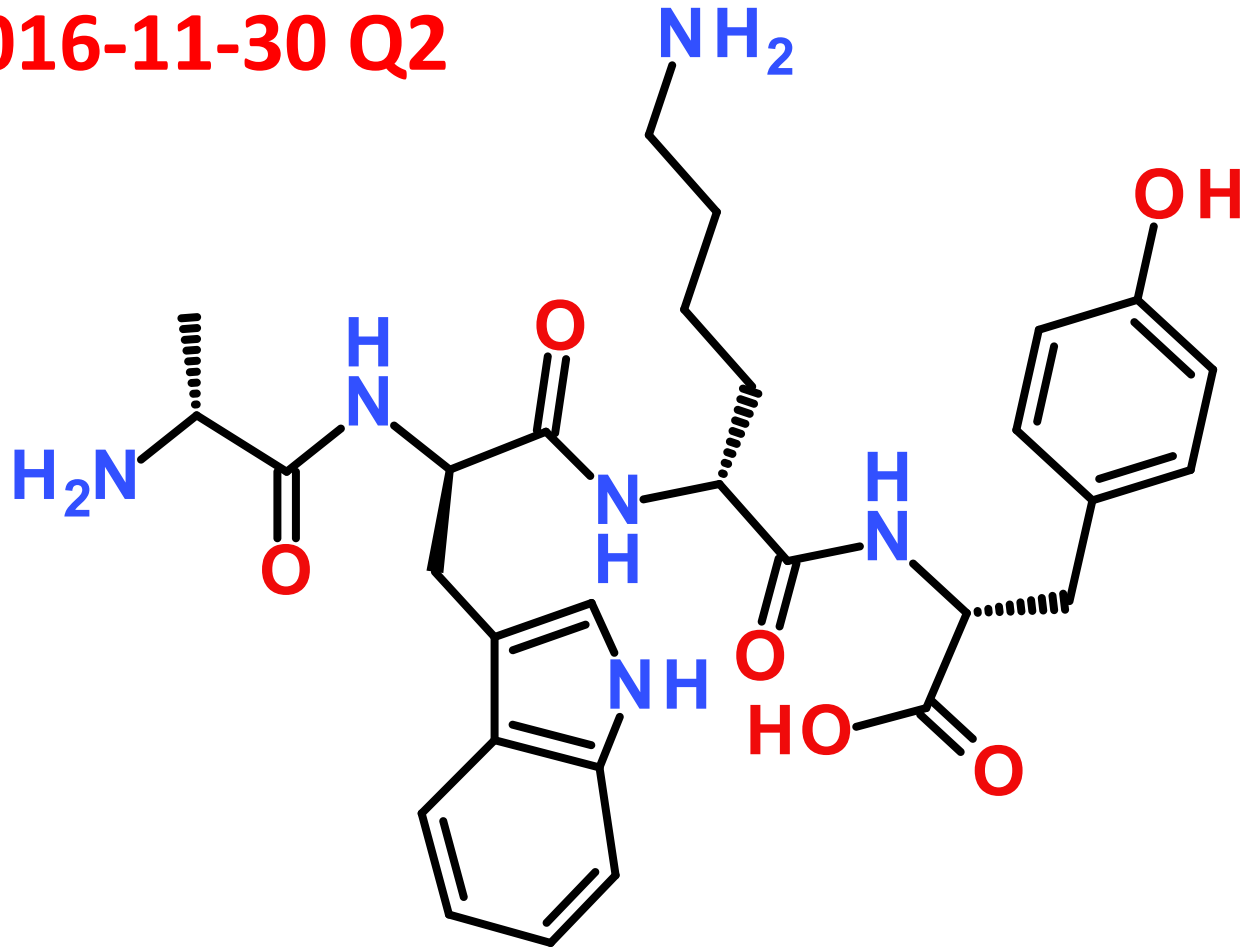
If all goes well,

- The lecture on Monday, December 5 will be a help session.
- Homework grades should be posted by Tuesday, December 6
- Class participation grades should be posted by Tuesday, December 6
- Read ahead bonus grades should be posted by Tuesday December 6

What is the total charge on this peptide at pH = 2?

- A. -3
- B. -2
- C. -1
- D. 0
- E. 1
- F. 2
- G. 3

2016-11-30 Q2



What is the total charge on this peptide at pH = 2?

A. -3

B. -2

C. -1

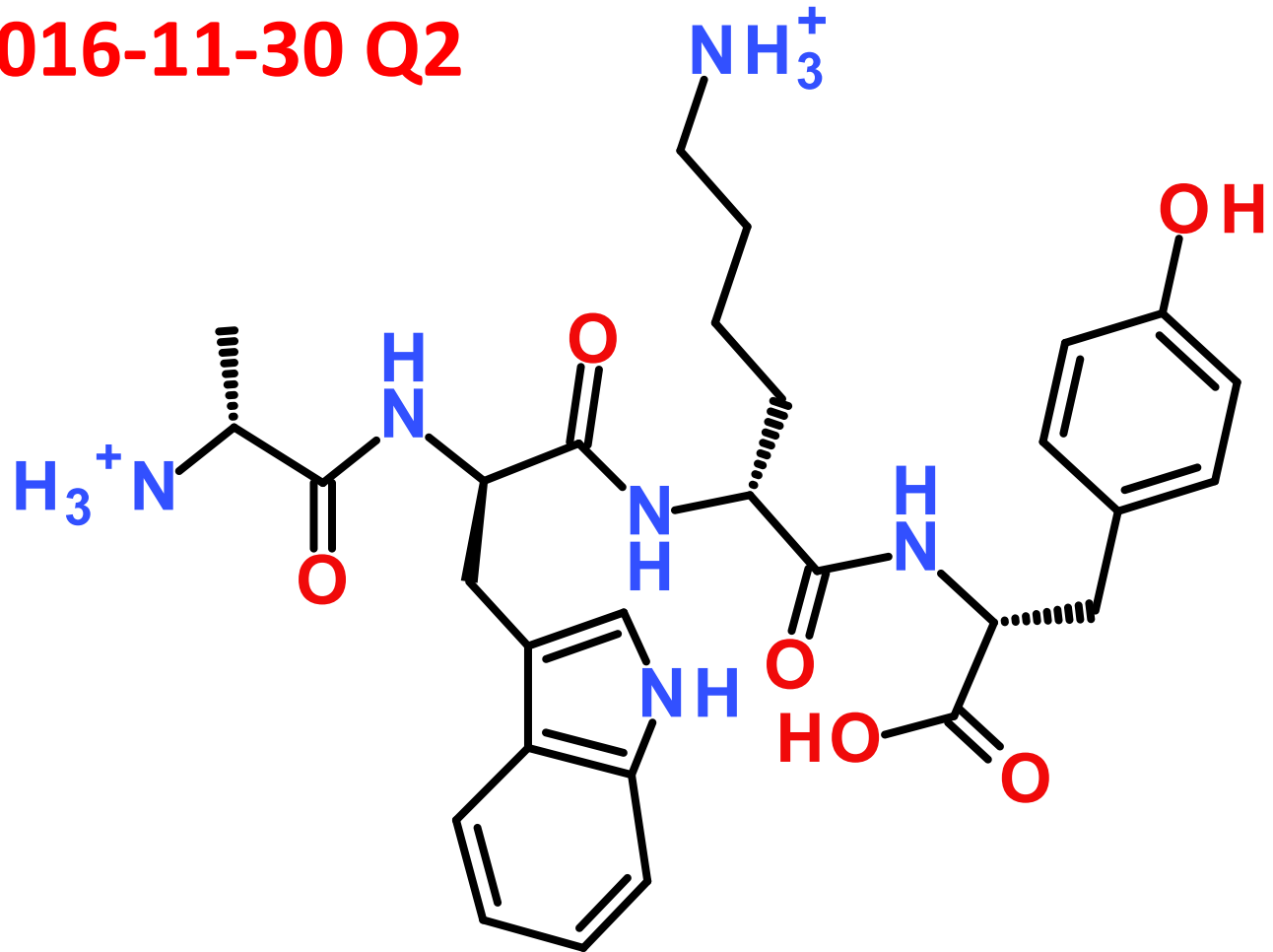
D. 0

E. +1

F. +2

G. +3

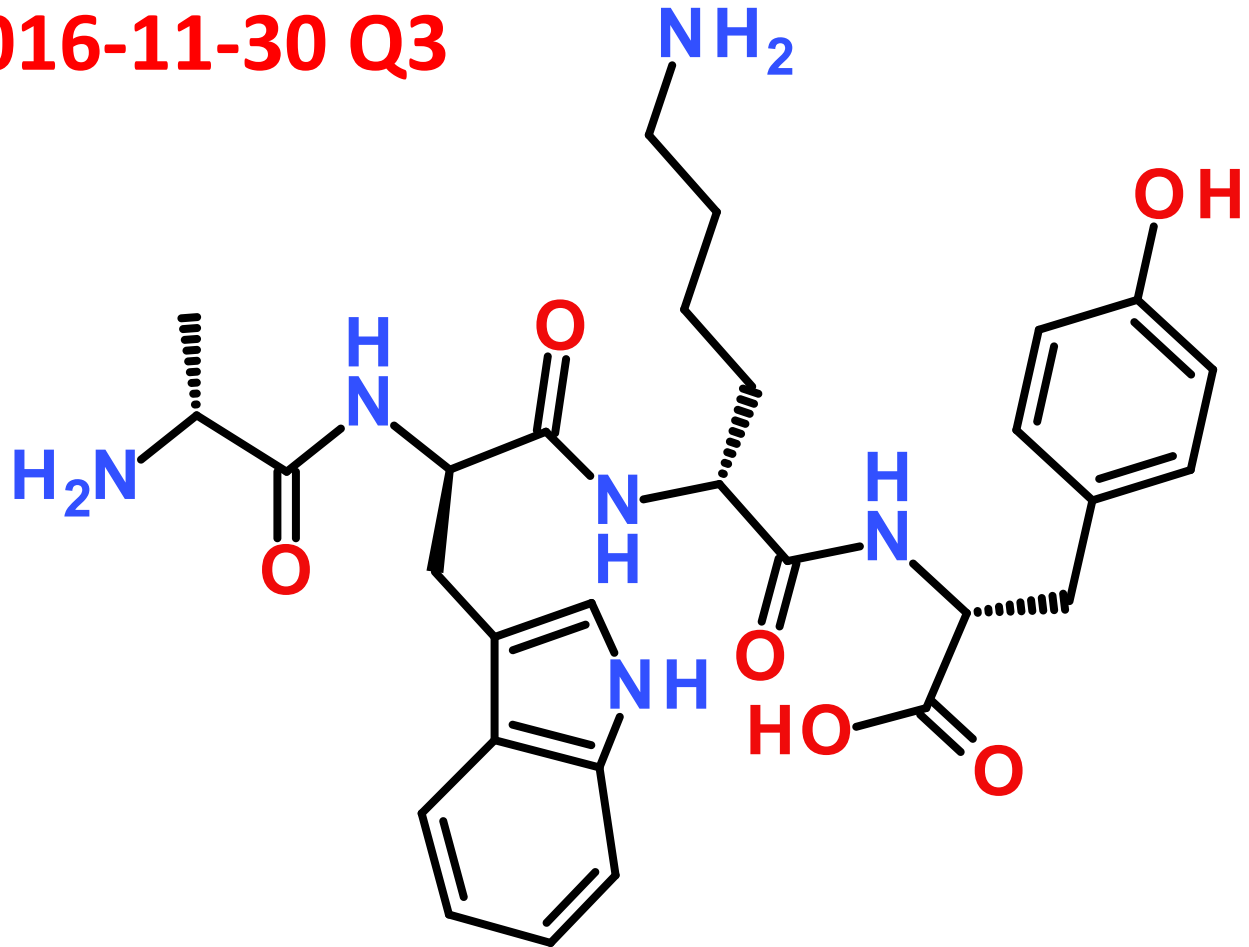
2016-11-30 Q2



What is the total charge on this peptide at pH = 7.3?

- A. -3
- B. -2
- C. -1
- D. 0
- E. +1
- F. +2
- G. +3

2016-11-30 Q3



What is the total charge on this peptide at pH = 7.3?

A. -3

B. -2

C. -1

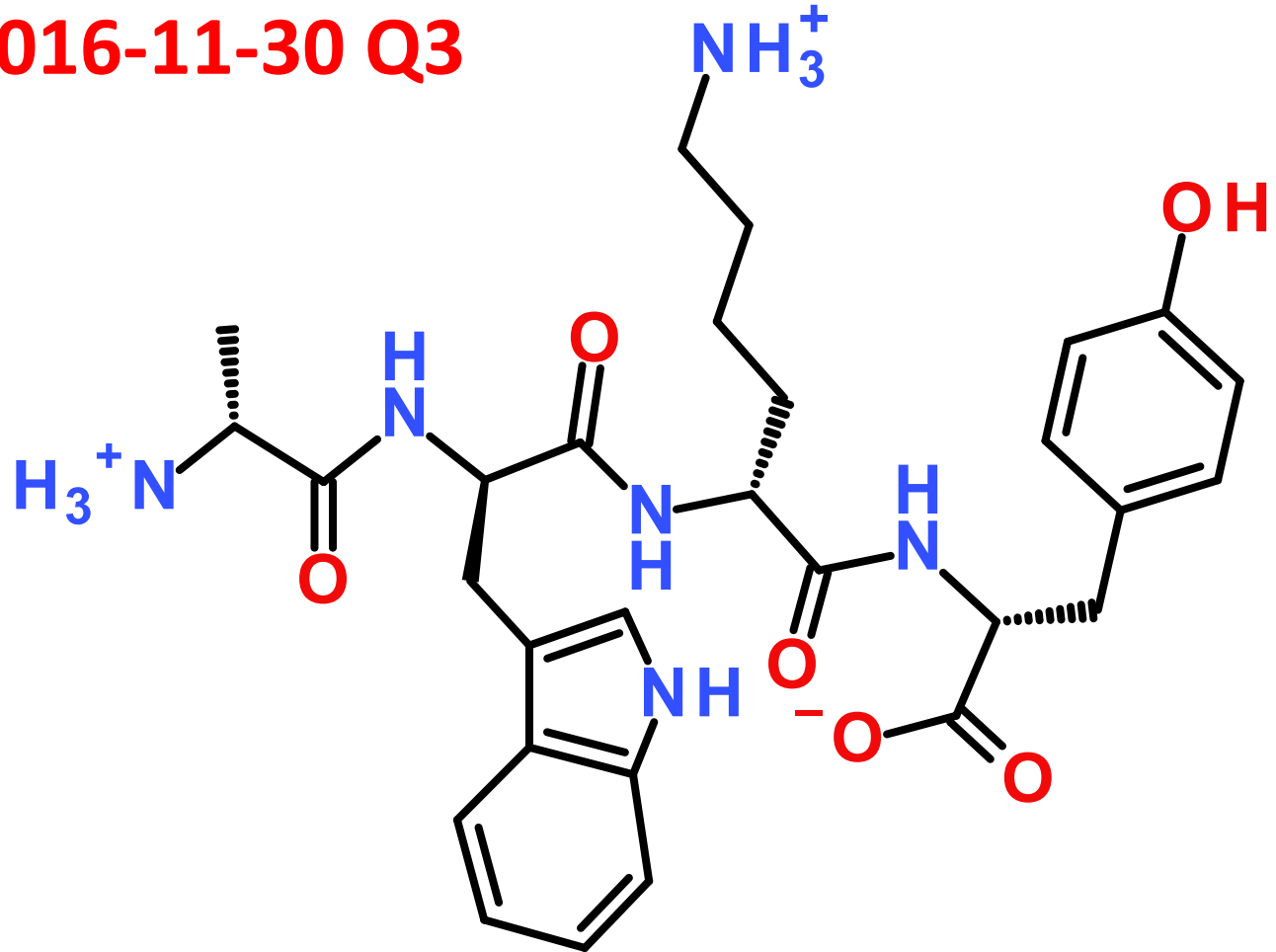
D. 0

E. +1

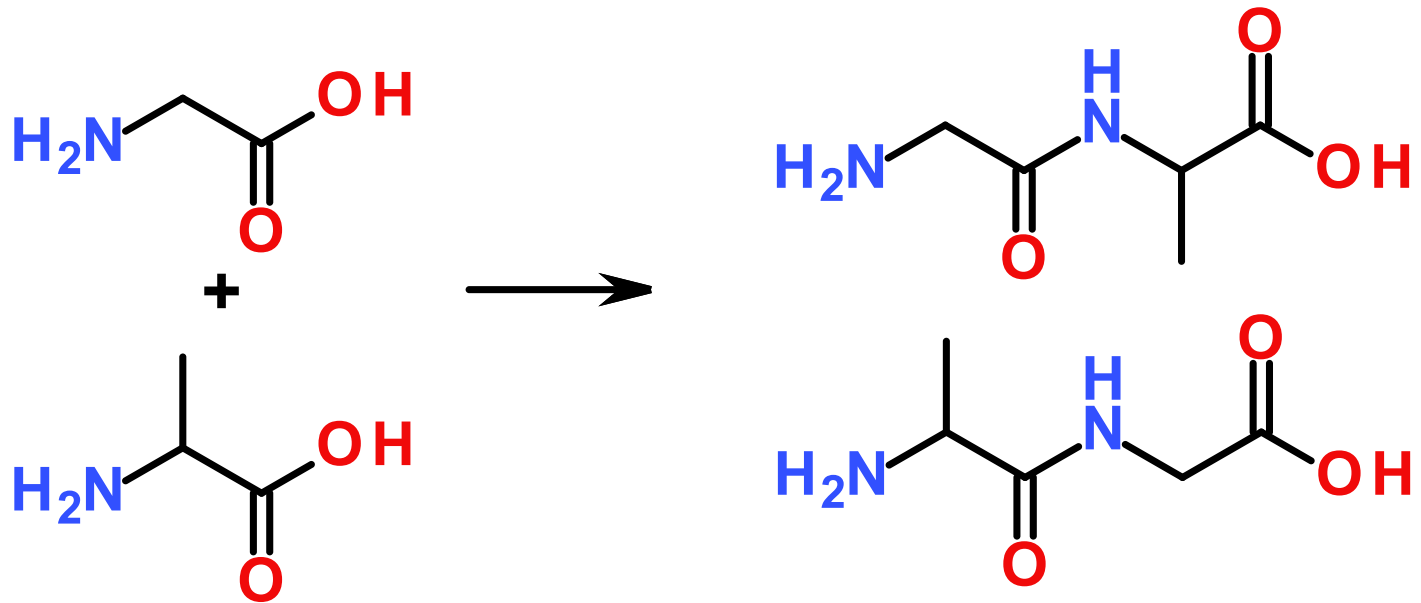
F. +2

G. +3

2016-11-30 Q3



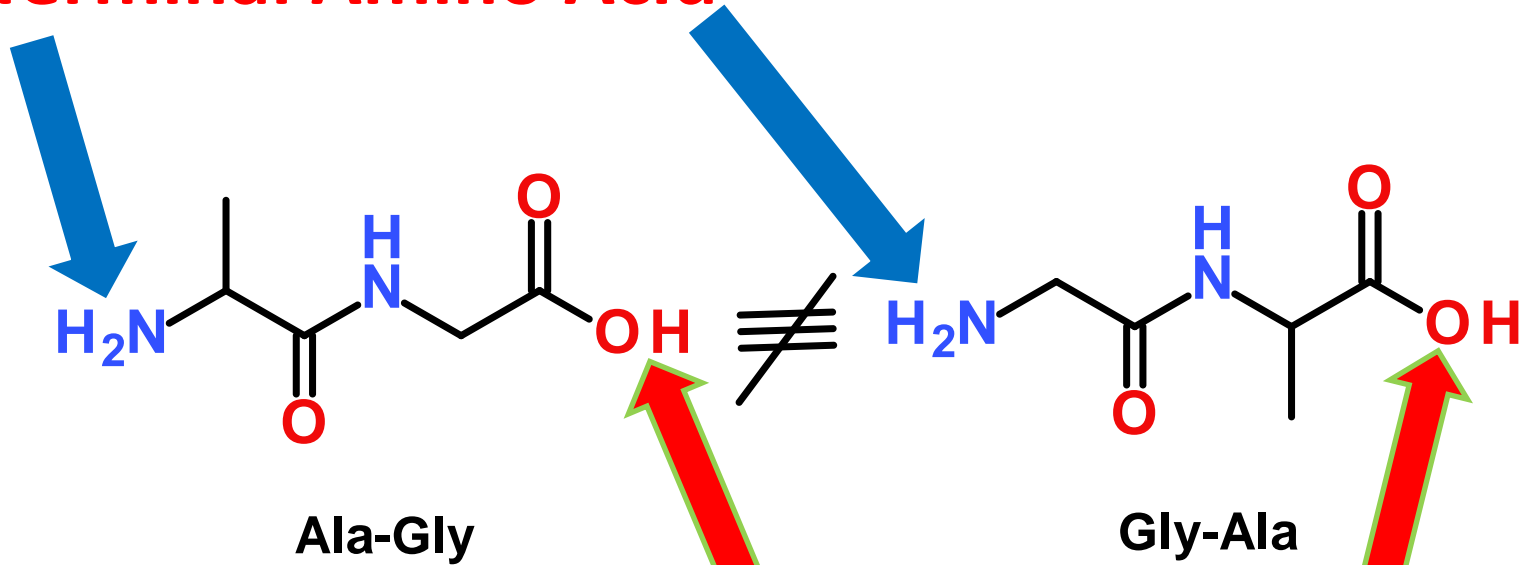
Towards Oligopeptides



2 different dipeptides!

Abbreviations for Peptides

N-Terminal Amino Acid



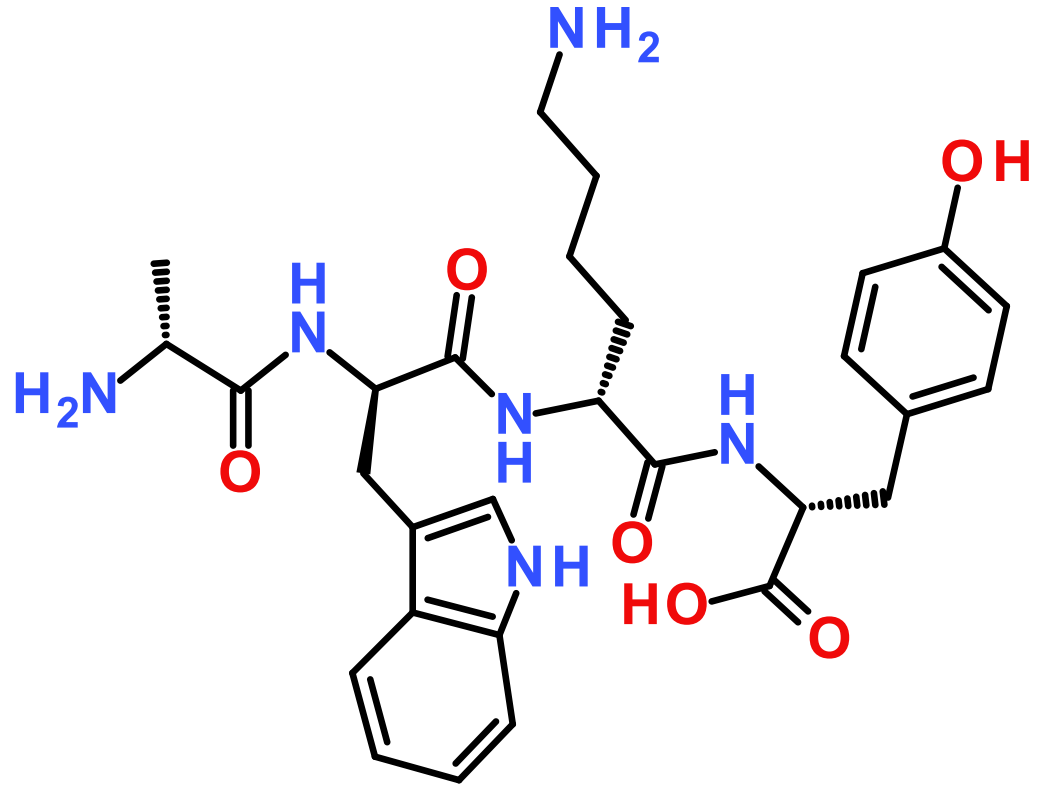
C-Terminal Amino Acid

Peptide Abbreviations are always written with the N-terminal AA to the left!

What is the correct name of this tetrapeptide?

2016-11-30 Q4

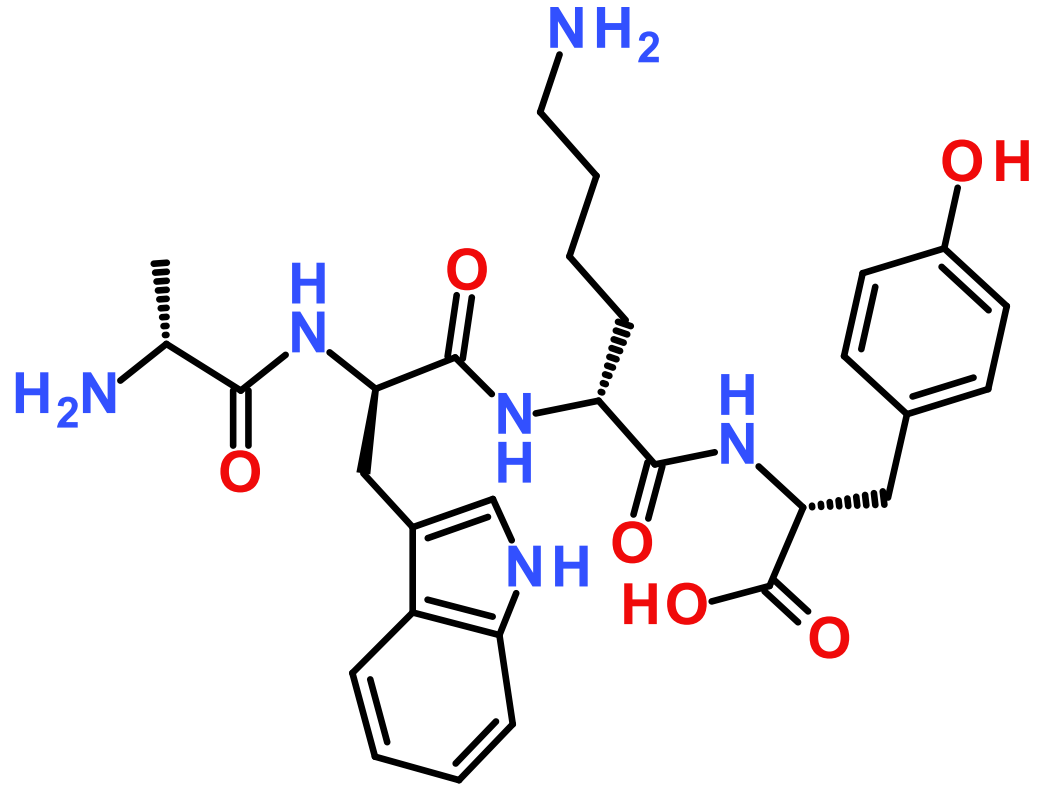
- A. Tyr-Lys-Trp-Ala
- B. Ala-His-Lys-Phe
- C. Ala-Trp-Lys-Tyr
- D. Arg-Lys-Trp-Ala
- E. Val-Trp-Lys-Cys
- F. Met-Leu-Ala-Tyr
- G. Gly-Phe-Asp-Lys



What is the correct name of this tetrapeptide?

2016-11-30 Q4

- A. Tyr-Lys-Trp-Ala
- B. Ala-His-Lys-Phe
- C. Ala-Trp-Lys-Tyr**
- D. Arg-Lys-Trp-Ala
- E. Val-Trp-Lys-Cys
- F. Met-Leu-Ala-Tyr
- G. Gly-Phe-Asp-Lys



Larger Peptides

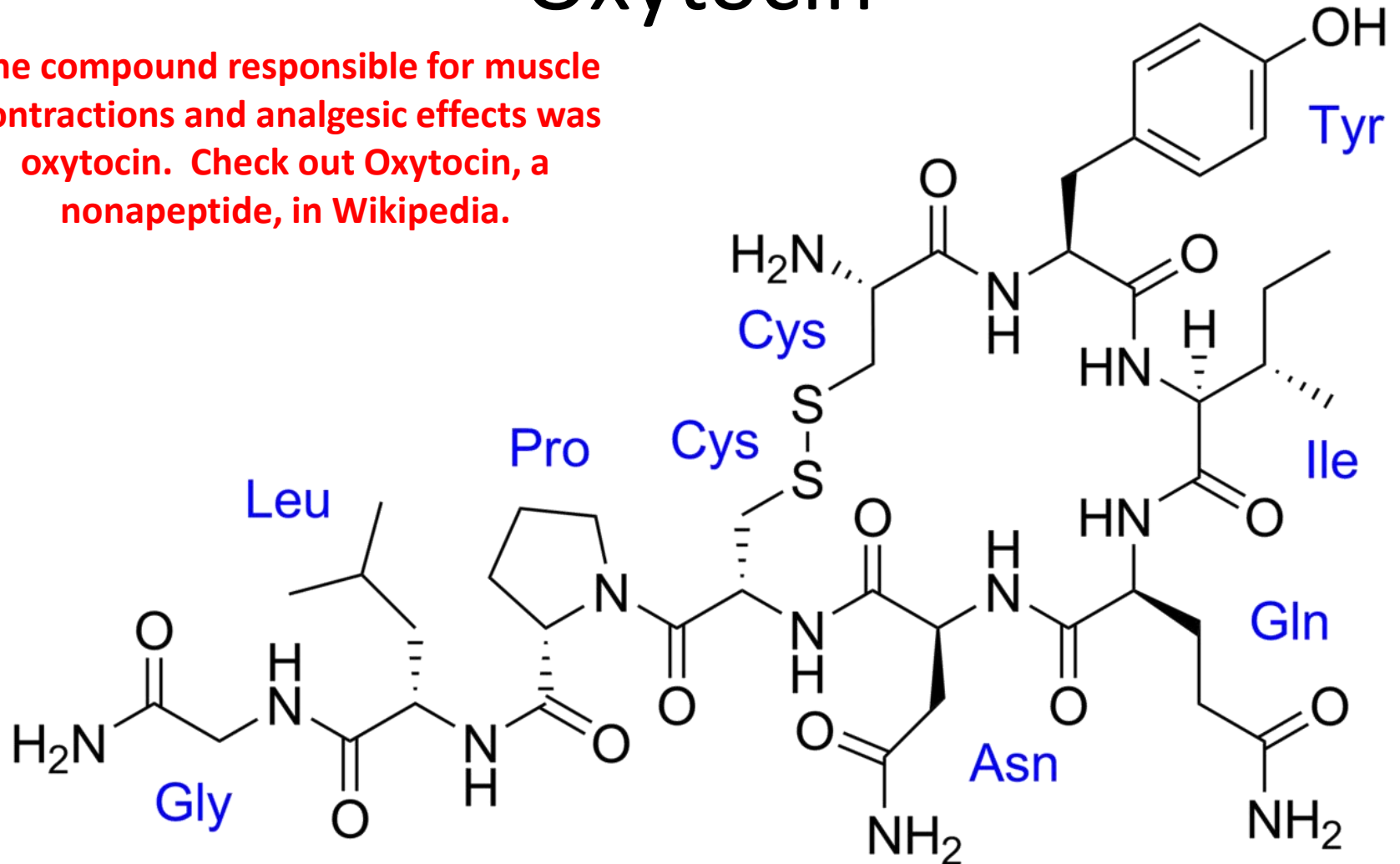
- For Important Peptides
 - Cure some disease
 - Produce some important effect
- Commercialization
 - Separate from natural products
 - Identify the structure
 - Synthesize from amino acids

Long, Long Ago

- Professor Penn had a lecture segment on Fridays about organic chemistry in the news
- WCLG talked on the radio on a Friday morning about some unidentified “orgasm drug”
 - Naturally, Penn’s students inquired as to the identity of this “useful” drug
 - The compound produced muscle contractions in female mice
 - The compound was patented by a research group in Massachusetts as a potentially very effective analgesic.
- The compound was timely for the lecture as Penn was just beginning to lecture about amino acids and peptides
- Professor Penn discussed the potential commercialization of this drug (although patented by the group in Massachusetts) and mentioned the word “orgasm” too many times in his lectures that semester.

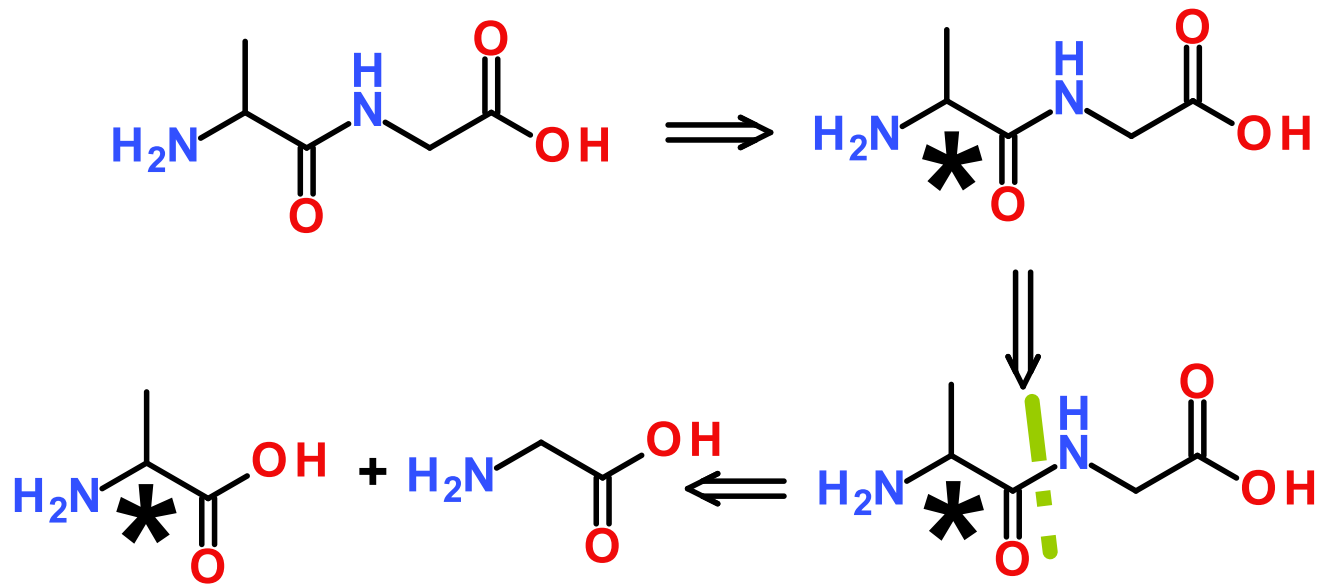
Oxytocin

The compound responsible for muscle contractions and analgesic effects was oxytocin. Check out Oxytocin, a nonapeptide, in Wikipedia.



Larger Peptides

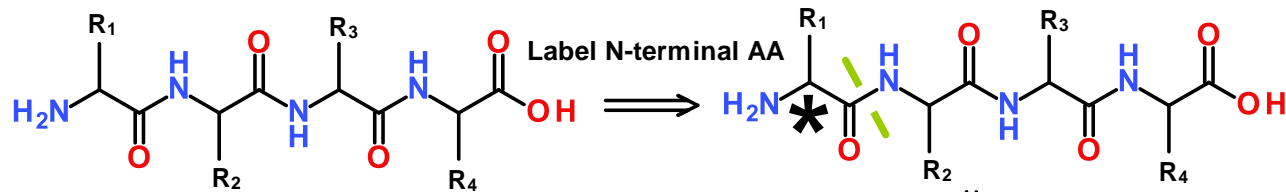
- For Important Peptides
 - Cure some disease
 - Produce some important effect
- Commercialization
 - Separate from natural products
 - **Identify the structure**
 - Synthesize from amino acids



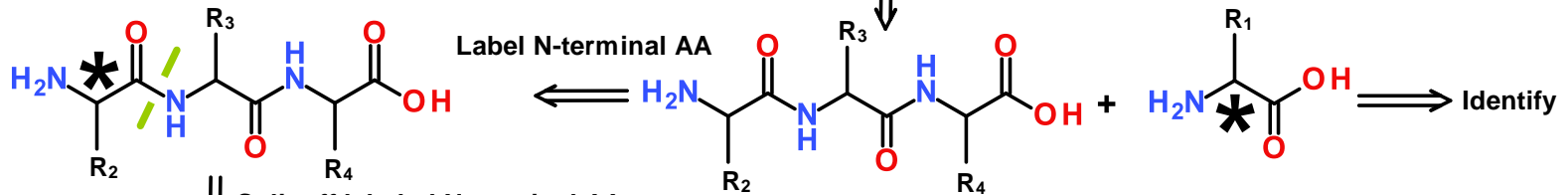
Starting from the beginning: Label one end of the peptide and then split the peptide.

DETERMINING PEPTIDE STRUCTURES

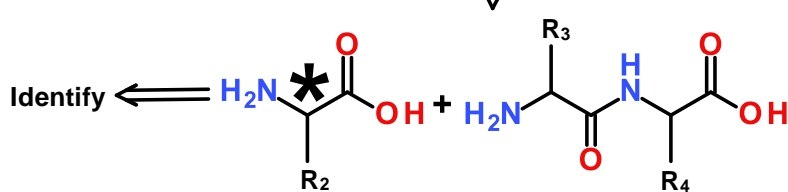
Moving Towards Automated Analysis of Larger Peptides



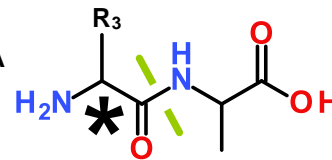
Split off labeled N-terminal AA and then separate the two "peptides"



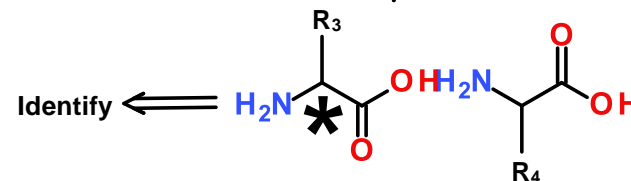
Split off labeled N-terminal AA and then separate the two "peptides"

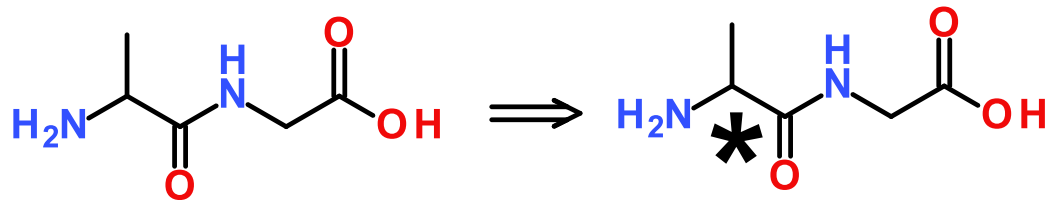


Label N-terminal AA

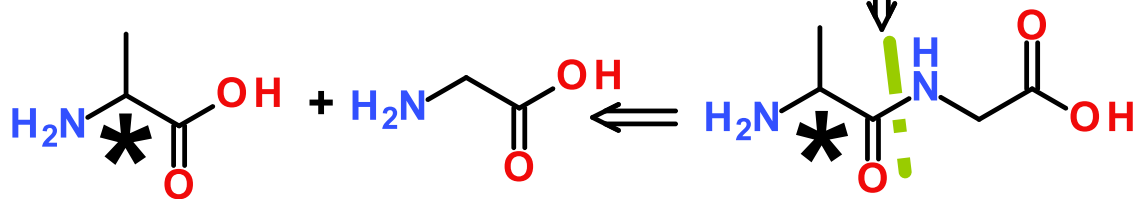


Split off labeled N-terminal AA and then separate the two "peptides"

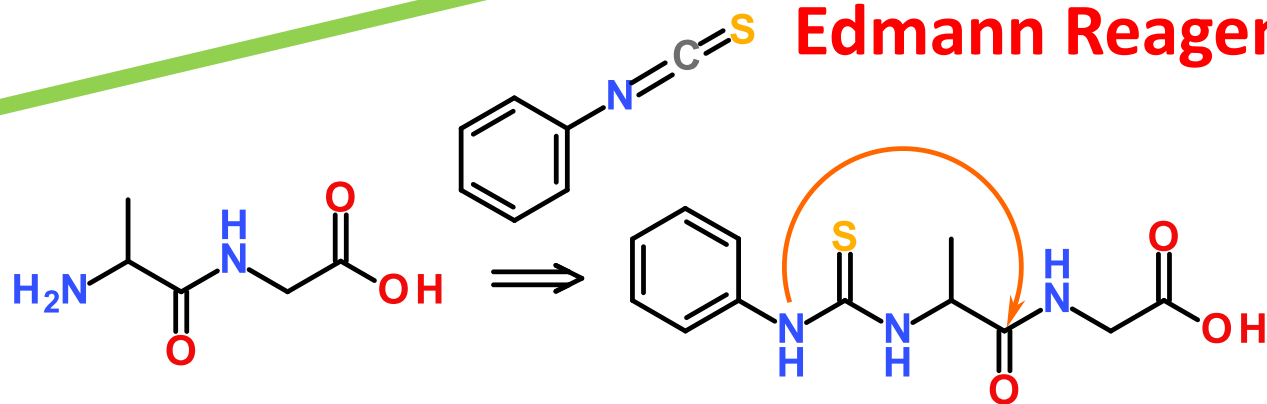




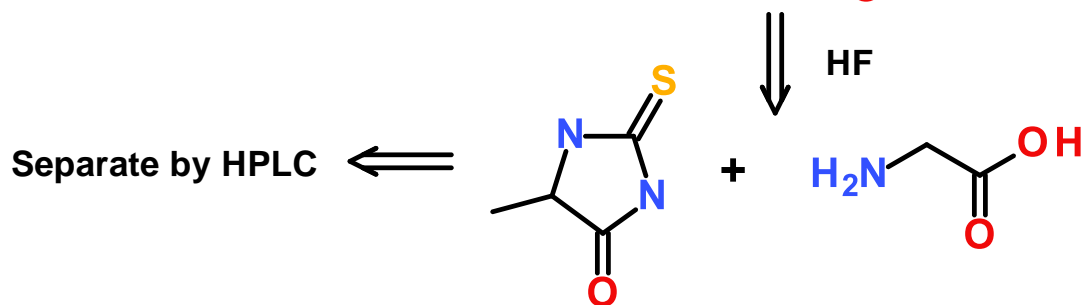
Reminder!



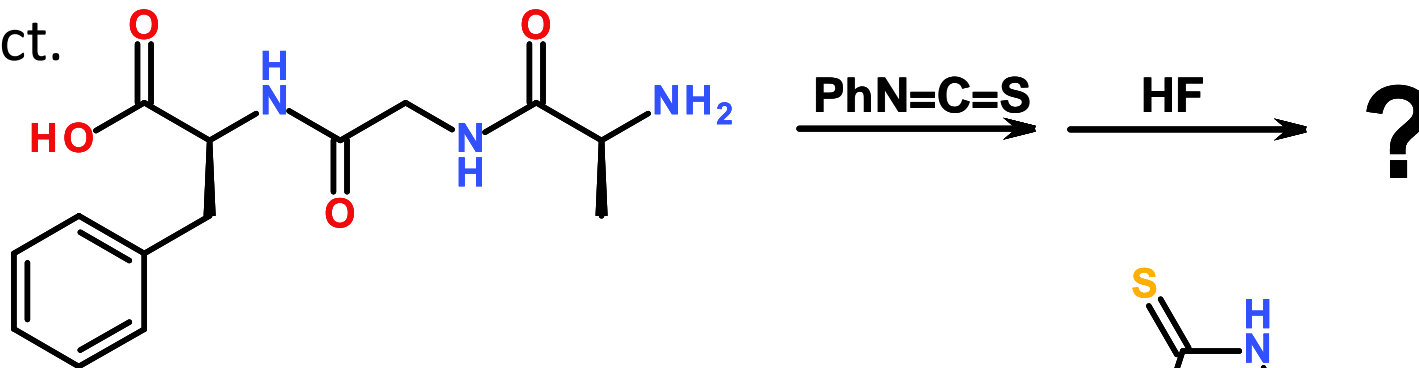
Edmann Reagent



Edmann
Degradation



What are the products of the following reaction? Make sure to give your answer as a text answer. More than one answer could be correct.



Phe-Gly

A

Gly-Phe

B

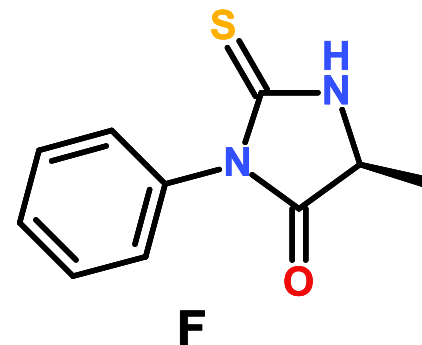
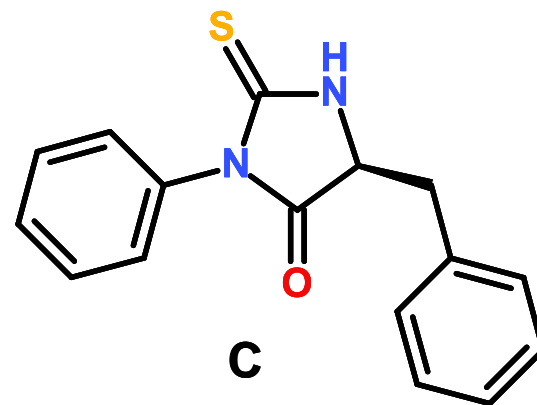
Gly-Ala

D

Ala-Gly

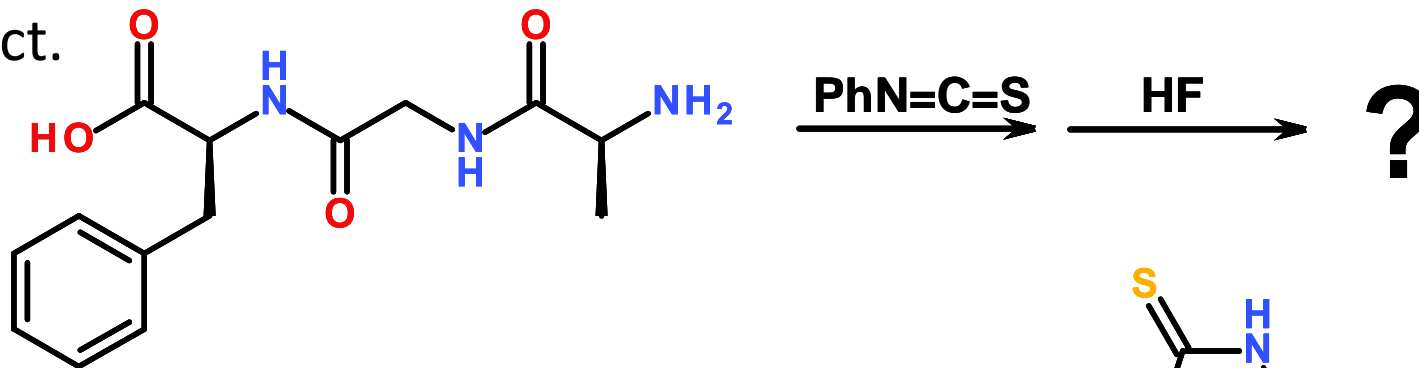
E

G – None of these answers is correct, or there is no correct answer here.



2016-11-30 Q5

What are the products of the following reaction? Make sure to give your answer as a text answer. More than one answer could be correct.



Phe-Gly

A

Gly-Phe

B

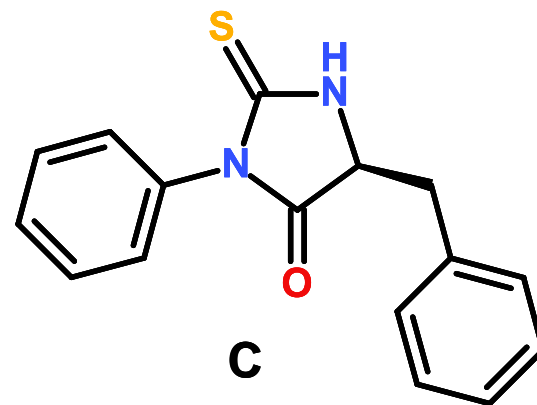
Gly-Ala

D

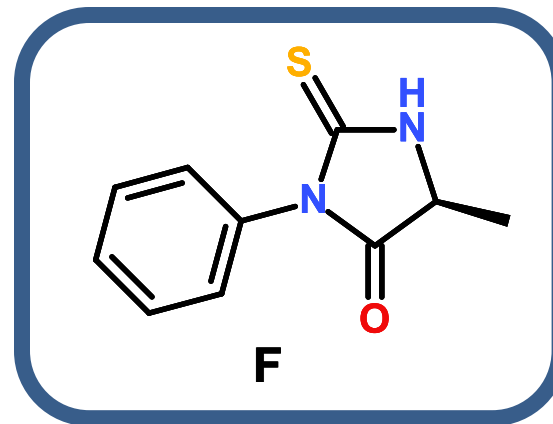
Ala-Gly

E

G – None of these answers is correct, or there is no correct answer here.



C



F

2016-11-30 Q5