

# Chem 352 - Fall 2018

## Graded Problem Assignment 3 (Due Thursday, 20. Dec.)

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For this assignment, You have each been assigned a pathway (A through H) that starts at pyruvate (Pyr) and ends with an amino acid (Ser, Glu, or Gln). You have also been assigned an enzyme that catalyzes one of the reactions in your assigned pathway

Pathway	Enzyme	email		Name
Pathway A: Pyr->Ser	3-phosphoglycerate dehydrogenase	AHRENSP7783@uwec.edu	Paige	Ahrens
Pathway A: Pyr->Ser	3-phosphoserine phosphatase	BERGOME@uwec.edu	Erin	Bergo-Mcdonald
Pathway A: Pyr->Ser	enolase	FUHRMAK4616@uwec.edu	Kelcie	Fuhrman
Pathway A: Pyr->Ser	phosphoenolpyruvate carboxykinase	OPIEKA0588@uwec.edu	Kelly	Opie
Pathway A: Pyr->Ser	phosphoglycerate mutase	RICHERAP5526@uwec.edu	Alex	Richert
Pathway A: Pyr->Ser	phosphoserine transaminase	SEAVERSL5484@uwec.edu	Savanna	Seaver
Pathway A: Pyr->Ser	pyruvate carboxylase	VANSTEHJ2861@uwec.edu	Hannah	Van Steenburgh
Pathway B: Pyr->Gln	aconitase	CHARLEEM5112@uwec.edu	Eva	Charlesworth-Seiler
Pathway B: Pyr->Gln	citrate synthase	DOVORANJ2085@uwec.edu	Nicholas	Dovorany
Pathway B: Pyr->Gln	glutamate dehydrogenase	HOLTECM8693@uwec.edu	Charlene	Holte
Pathway B: Pyr->Gln	glutamine synthetase	KLEISTSA2580@uwec.edu	Sierra	Kleist
Pathway B: Pyr->Gln	isocitrate dehydrogenase	MACKOWSG6543@uwec.edu	Sarah	Mackowski
Pathway B: Pyr->Gln	pyruvate carboxylase	VRANGALN3730@uwec.edu	Naim	Vrangalla
Pathway C: Pyr->Ser	3-phosphoglycerate dehydrogenase	ARUMUGAD2697@uwec.edu	Dhiyanni	Arumugam
Pathway C: Pyr->Ser	3-phosphoserine phosphatase	BOYDBC8859@uwec.edu	Benjamin	Boyd
Pathway C: Pyr->Ser	enolase	GUTJAHEA@uwec.edu	Erica	Gutjahr
Pathway C: Pyr->Ser	phosphoenolpyruvate carboxykinase	PUSERM3136@uwec.edu	Melany	Puser
Pathway C: Pyr->Ser	phosphoglycerate mutase	ROTTIEHJ5567@uwec.edu	Haley	Rottier
Pathway C: Pyr->Ser	phosphoserine transaminase	SHORTJR0455@uwec.edu	Jessica	Short
Pathway C: Pyr->Ser	pyruvate carboxylase	WALKERAM4210@uwec.edu	Ashley	Walker
Pathway D: Pyr->Glu	aconitase	COLWITEE6311@uwec.edu	Eric	Colwitz
Pathway D: Pyr->Glu	citrate synthase	EGBERTKR2580@uwec.edu	Kelsey	Egbert
Pathway D: Pyr->Glu	glutamate dehydrogenase	HOLTENJC6519@uwec.edu	Jacquelyn	Holten
Pathway D: Pyr->Glu	isocitrate dehydrogenase	MAGNOCB1142@uwec.edu	Claire	Magno
Pathway D: Pyr->Glu	pyruvate carboxylase	WHITENR6428@uwec.edu	Nolan	White
Pathway E: Pyr->Ser	3-phosphoglycerate dehydrogenase	BAUMGARE4855@uwec.edu	Erin	Baumgartner
Pathway E: Pyr->Ser	3-phosphoserine phosphatase	CASWELOM9728@uwec.edu	Olivia	Caswell
Pathway E: Pyr->Ser	enolase	HAMMILAJ@uwec.edu	Ayla	Hammill
Pathway E: Pyr->Ser	phosphoenolpyruvate carboxykinase	RICCIAMT2267@uwec.edu	Maria	Ricciardi
Pathway E: Pyr->Ser	phosphoglycerate mutase	SANDERBA3037@uwec.edu	Bailey	Sanderson
Pathway E: Pyr->Ser	phosphoserine transaminase	SMETANLC@uwec.edu	Lexie	Smetana
Pathway E: Pyr->Ser	pyruvate carboxylase	WITTEK2556@uwec.edu	Emily	Witt
Pathway F: Pyr->Gln	aconitase	COPPINKL2424@uwec.edu	Kyra	Coppinger
Pathway F: Pyr->Gln	citrate synthase	FIKEZA3888@uwec.edu	Zachary	Fike
Pathway F: Pyr->Gln	glutamate dehydrogenase	HUTHERHA3763@uwec.edu	Holly	Huther
Pathway F: Pyr->Gln	glutamine synthetase	KOSTREMJ9645@uwec.edu	Mckenzie	Kostreva
Pathway F: Pyr->Gln	isocitrate dehydrogenase	MCCANNMP1498@uwec.edu	Maxwell	McCanna
Pathway F: Pyr->Gln	pyruvate carboxylase	XIONGM@uwec.edu	Mai	Xiong
Pathway G: Pyr->Glu	aconitase	CROTTEEL5062@uwec.edu	Liz	Crotteau
Pathway G: Pyr->Glu	citrate synthase	FRAMEJR9769@uwec.edu	John	Frame
Pathway G: Pyr->Glu	glutamate dehydrogenase	JEHNJM9967@uwec.edu	Julia	Jehn
Pathway G: Pyr->Glu	glutamine synthetase	LAFFERREJ9868@uwec.edu	Ethan	Laferriere
Pathway G: Pyr->Glu	isocitrate dehydrogenase	MOONEYRL9249@uwec.edu	Rachel	Mooney
Pathway H: Pyr->Gln	aconitase	DEETZCS9389@uwec.edu	Corwin	Deetz
Pathway H: Pyr->Gln	citrate synthase	FRANKRE6576@uwec.edu	Rebecca	Frank
Pathway H: Pyr->Gln	glutamate dehydrogenase	KINGJH1332@uwec.edu	Jessica	King
Pathway H: Pyr->Gln	glutamine synthetase	LUNDTE@uwec.edu	Timothy	Lund
Pathway H: Pyr->Gln	isocitrate dehydrogenase	ONKENEL5989@uwec.edu	Emily	Onken
Pathway H: Pyr->Gln	pyruvate carboxylase	ZEHNERBC3136@uwec.edu	Brittany	Zehner

**Tasks:**

1. Sketch out each of the steps in your assigned pathway, starting at pyruvate, and using structural formulas for the intermediates.
  - a. If you wish to do this electronically, you may want to try using [MarvinSketch](#) or [ChemDraw](#)
  - a. Besides the intermediates, you should balance each reaction by including any other reactants or products using curved arrows.
  - b. Name each intermediate
  - c. Name each enzyme in your assigned pathway and circle the name for your assigned enzyme. Also, identify the enzyme class for each of the enzymes.
  - d. Submit a hardcopy of your pathway, either at the final exam time, or place it in the folder outside my office (Phillips 437) by Thursday, 20. December.
2. Participate in an email thread that reconstructs the pathway that you are a member of.
  - a. When you receive an email from the individual who was assigned the enzyme immediately before yours in your assigned pathway, then forward the email to the individual who was assigned the next enzyme in your pathway. The subject line of this email should look something like this,

**Subject** Fwd: Chem 352-Pathway C: Pyr -> Ser

- i. I will get things started by sending out emails with the appropriate subject line and the word "Pyruvate" in the body.
- b. If all is right, you should find the substrate for your enzyme at the bottom of the body of the email.
- c. Select the "Forward" option from your email app
  - i. Do not change the subject line
  - ii. Delete any signature or header information that gets inserted by your email app, but do not worry about any indenting that the email app may want to do.
  - iii. At the bottom of the email
    1. insert a blank line
    2. then type **"I am '*the name of your enzyme*' and I am passing on to you**
    3. insert another blank line
    4. ***'name of the product of your enzymes***
  - iv. Address the email to the individual who was assigned the enzyme that comes after you in your assigned pathway and carbon copy me ([wgallagh@uwec.edu](mailto:wgallagh@uwec.edu)).
  - v. Then hit "send".
- d. You are welcome to communicate and collaborate with the other members of your assigned pathway until you can get the thread to work right.
- e. As an example, if your assigned pathway was a part of the glycolytic pathway, starting at glucose and ending at fructose 1,6-bisphosphate, the result would look something like this:

**Subject** Fwd: Chem 352 Pathway X: glucose -> fructose 1,6-bisphosphate

```
glucose
I am hexokinase and I am passing on to you
glucose 6-phosphate
I am glucose 6-phosphate isomerase and I am passing on to you
fructose 6-phosphate
I am phosphofructokinase and I am passing on to you
fructose 1,6-bisphosphate
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