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BSCI:414 Lab 1--Benchling and PCR

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ABSTRACT

Lab 1 Overview

Discuss and Begin Lab Notebooks in Benchling

Import and Explore DNA in Benchling

Make primers in Benchling

PROTOCOL CITATION

Harley King 2020. BSCI:414 Lab 1--Benchling and PCR. **protocols.io**

<https://protocols.io/view/bsci-414-lab-1-benchling-and-pcr-bku6kwze>



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41598

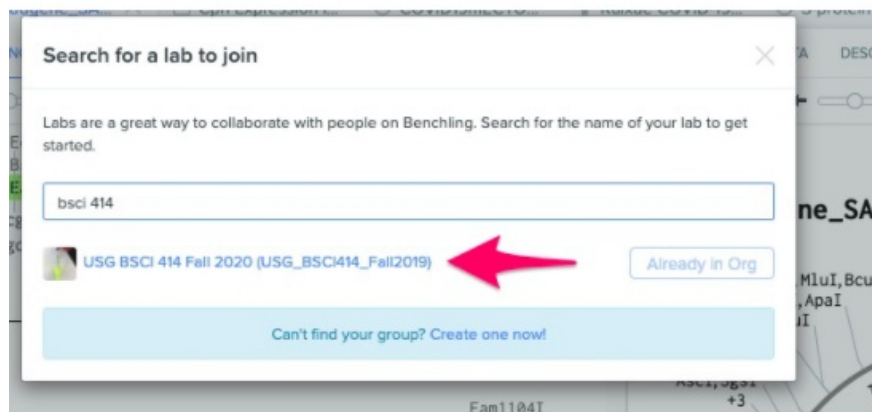
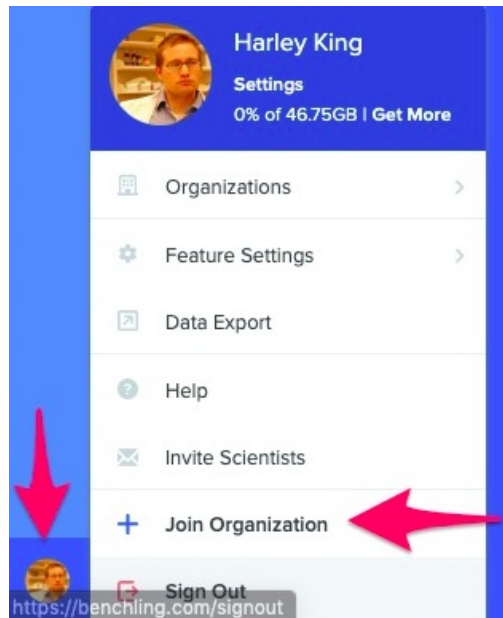
Benchling Lab Notebook Tutorial 10m

1 Introduce last semester's lab notebooks. 5m

2 Discuss features of a good lab notebook e.g. dates, navigation. 5m

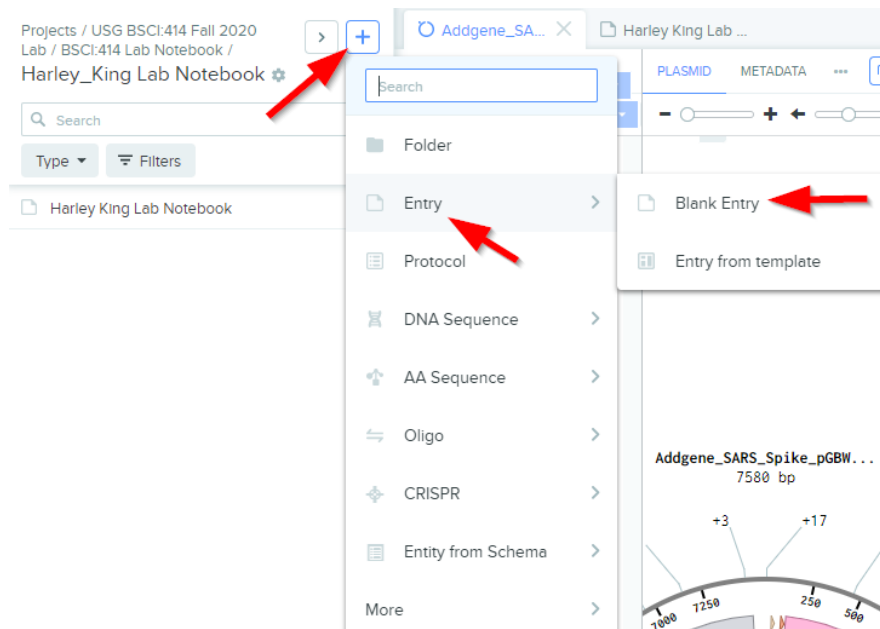
Students Begin Lab Notebook 15m

3 Sign into Benchling, join and find project "USG BSCI:414 Fall 2020 Lab". 15m



- 4 Begin your own lab notebook by:
1. Creating folder entitled "FirstName LastNameLab Notebook" under Projects/USG BSCI:414 Fall 2020 Lab/"
 2. Clicking "+" sign and "Entry>Blank Entry". Entitle this the same as the folder e.g. Harley King Lab Notebook"
 3. Begin by including a link to this protocol.

15m



Create a Benchling Lab Notebook using Entry>Blank Entry

Benchling DNA Tutorial 15m

15m

5 Overview of Benchling sequences

1. Importing DNA
2. Copying/pasting DNA
3. Understanding DNA features
4. Undo history

cttctatgcaccatcatcaccatcatgggtggttctggtatgtctgatt
gaagatacgtgtagtagtgtagtaccaccaagaccatacagactaa

2 4 6 8 10 12 14

HISTORY LINEAGE

Change	User	Timestamp
Deleted HarleyKingco...	harleyk	9/4 11:48 AM
Deleted HarleyKingco...	harleyk	9/4 11:48 AM
Deleted HarleyKingco...	harleyk	9/4 11:48 AM
Deleted HarleyKingco...	harleyk	9/4 11:48 AM
Deleted HarleyKingco...	harleyk	9/4 11:48 AM
Deleted HarleyKingco...	harleyk	9/4 11:47 AM

RESET TO VERSION

Edit Version Name

Name Deleted HarleyKingcopy_Addgene_SAF

UPDATE VERSION

5.

30m

6 Students Import DNA sequences

1. Create a new folder called "FirstName LastName Lab 1" under "Projects/USG BSCI:414 Fall 2020 Lab/Lab 1"
2. Import a DNA sequence and attempt the following:
 - Delete part of the DNA.
 - Undo the deletion.
 - Add bases to the DNA.
 - Delete the additional bases.
 - Do crazy stuff and then use the "Undo History" to reset the plasmid back to its original state.

Create and Run Virtual PCR Tutorial

15m

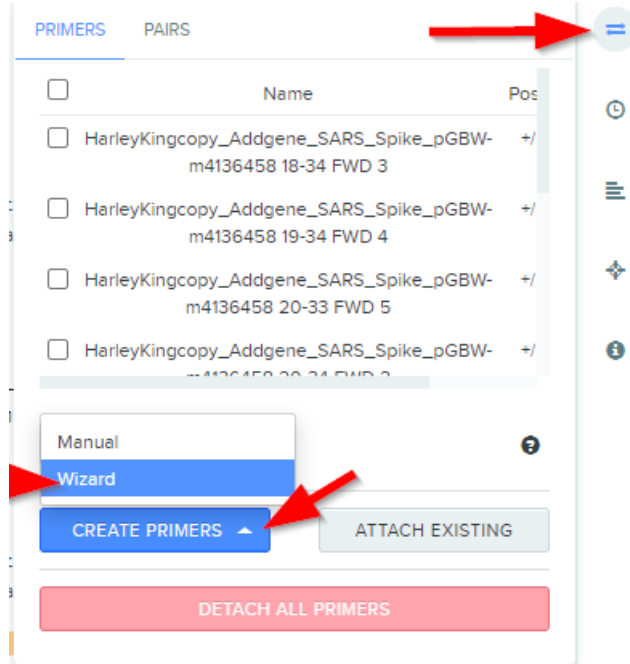
15m

- 7 Import DNA sequence
Make primers

Students Create and Run Virtual PCR

1h

- 8 1. Into your lab 1 folder, copy the sequence "Addgene_SARS_Spike_pGBW-m4136458" from "Projects/USG BSCI:414^{1h} Fall 2020 Lab/". Put your name in front of the sequence e.g. "HarleyKingcopy_Addgene_SARS_Spike_pGBW-m4136458".
2. Select a sequence from this plasmid < 3kb
3. Select primer icon from right side then "CREATE PRIMERS" then "Wizard".
4. The target range can be any shift-selected bp region or you can enter numbers like 0 to 3000. click "Generate Primers".
5. With luck, a few primer options will appear on the next screen. Notice that each contains a forward "FWD" and reverse "REV" primer. Both are necessary for successful PCR.
6. Select one "FWD" and one "REV" primer with a checkmark. Select "Save Selected Primers". In the box that pops up, save them to your Lab 1 folder.
7. Return to "Sequence Map". Scroll through the sequence and find your primers. Rename the primers by right clicking>Edit and changing the name.
8. Shift select between the primers. How many bp is the fragment? Note this in your lab notebook.



Select primer icon, then "Create Primers" then "Wizard".

Save Selected Primers		Export as CSV						
<input type="checkbox"/>	Penalty	Direction	% GC	T _m /°C	Location	Length	Product BP	Primer
<input checked="" type="checkbox"/>	0.007	<input checked="" type="checkbox"/> FWD	50.0%	62.0°	3569-3590	22	240	5' AGAATGCGTACTTGGCCAGTCT 3'
<input type="checkbox"/>		<input type="checkbox"/> REV	50.0%	62.0°	3787-3808	22		5' TAGAAGTTACCGTGGCTCACGA 3'
<input type="checkbox"/>	0.007	<input type="checkbox"/> FWD	50.0%	62.0°	3569-3590	22	243	5' AGAATGCGTACTTGGCCAGTCT 3'
<input type="checkbox"/>		<input type="checkbox"/> REV	50.0%	62.0°	3790-3811	22		5' TCGTAGAAGTTACGCTGGGTCA 3'
<input checked="" type="checkbox"/>	0.012	<input type="checkbox"/> FWD	50.0%	62.0°	5175-5196	22	1039	5' ACTCTAGCTTCCCGCAACAAT 3'
<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/> REV	50.0%	62.0°	6192-6213	22		5' TTGCCGGATCAAGAGCTACCAA 3'
<input type="checkbox"/>	0.012	<input type="checkbox"/> FWD	50.0%	62.0°	5175-5196	22	1040	5' ACTCTAGCTTCCCGCAACAAT 3'
<input type="checkbox"/>		<input type="checkbox"/> REV	50.0%	62.0°	6193-6214	22		5' TTGCCGGATCAAGAGCTACCAA 3'
<input type="checkbox"/>	0.013	<input type="checkbox"/> FWD	50.0%	62.0°	3569-3590	22	936	5' AGAATGCGTACTTGGCCAGTCT 3'
<input type="checkbox"/>		<input type="checkbox"/> REV	50.0%	62.0°	4483-4504	22		5' TTGGAACCTCTTACGTGCCGAT 3'

Select 1 "FWD" primer and 1 "REV" primer.

Update Lab Notebooks

- In your lab notebook, use "@ mention" to link the name of your plasmid. Also link the renamed primers. Note how many bp your PCR fragment is.

