

(Updated) Microscopy Usability Testing - June 3-4, 2014

Usability Test #1

Tuesday, June 3 @ 9 am

Female, graduating senior (just had a baby 1.5 weeks before spring 2014 semester)

May have seen StarCellBio in 7.02?

Took 7.06 in Fall 2011 (as a sophomore)

Lab experience - have done 4 continuous years of UROP, cell culture

Mac User

Was able to make an account ok

Assignments Page

Usability assignment is automatically selected, not the microscopy one, but navigated to the microscopy one just fine

Clicked 'Start Experiments' before she had finished reading the whole assignment

Setup page

The Add Samples window has all of the combinations for her. She was expecting to add the strain then adding the treatments and then the time points

Selected all of the 3 month time points

Microscopy Experimental Technique

Unsure what the tabs are in the microscopy experimental technique - are they different slides? are they different experiments?

Microscopy Setup page

not sure why a second analysis drop down menu is appearing

Load

- Expected the samples to be automatically

Analyze

- wants to zoom in on the images, can see that she is at 4x, but realized that there is not a way to increase the magnification
- plays with focus - course and fine
- used cursor to drag the image across the lens
- used brightness
- Objective is selected for her, but it is confusing to her that it is selected for her and she can't change it, especially when the objectives don't align across samples

Then wants to setup a new experiment - used the navigation bar to navigate back to setup page, then did see the New experiment button

- "I don't know why I didn't notice that. It's large and red."

Then she set up a new experiment and selected all samples this time

- Was unsure on the setup page: Why do only some samples have IHC and/or IF conditions? but realized that this may be hard to find all of the images
- Can't figure out how to select both IHC conditions because previously got locked out of the extra drop down menu that appeared - but didn't even try to select the analysis drop down again. So went back, started a new experiment, and duplicated samples in the setup page. But later realized that she could have selected another microscopy technique instead of setting up a whole new experiment.
- IF image - couldn't find image, couldn't figure out that she needs to turn on the laser
- has to refocus all of the images, but recognizes this is like real life, but may be annoying if you have to do it 20 times

Lab notebook - would be neat if you could bring it up and have it on the screen while you are looking at the slides, etc.

Katherine then went back and directed her to the drop down menu functionality on the setup page. She didn't think this was obvious, but likes the functionality
Now with different tabs thinks that it's the same slide so having different objectives is confusing.

Conclusion

- A lot of buttons so confusing at first, but is more clear now
- Makes you take more steps than would seem necessary
- Unsure if it will save her data
- Felt like didn't need reference library or links to definitions that are within the program when she can look it up on her own

Likes

- it's online, less likely to encounter difficulties if you don't have to download it
- microscope controls were good, realistic

Changes

- same objective across the same sample or across all slides

Main points

- Drop down menus in setup page
- Objectives across images should match - especially if you can't change the objective. Can't figure out if some of the zoomed in images are zoomed in images of other parts of the low objective image
- Couldn't make an IF image visible
- Would prefer to setup the experiment with drop down menus so she can make her own decisions

Usability Test #2

Tuesday, June 3 @ 11 am

Female

Heard of StarGenetics - used it in Fall 2011 when it was in every problem set

Has not used StarCellBio

graduating senior
7.06 in Fall 2012

Mac User

Lab experience - has done a UROP, but not in a biology lab. It was in a chemistry lab. She has done western blotting before. She knows microscopy in theory, but hasn't done it

[internet connection appears a little slow - but it worked fine]

Experiment Setup

- Added all of the 3 month samples for her first experiment
- wasn't sure about copy icon at first

Microscopy Pages

Setup Page

- was unsure about the extra drop down menu - but not bothered by it, and figured it out really quickly

Load

- Got to Load page, turned light and laser on before slides were loaded. Then clicked 'Load'

Analyze

- Would like to see images side by side (this will maybe help in the Lab Report)

After setting up one experiment with all of the 3 month time points, she struggled to find a new experiment Katherine played the role of TA and she set up a new experiment
She then set up a new experiment with all of the 1 year time points

- IF image was the first one selected so the laser automatically turned on for her
- Then was able to easily turn on light for IHC slides

Katherine asked her about doing all of the samples in one experiment. And she did. Then selected multiple analyses for some samples to see what it would like like on the next page.

Had a bug with a black and white IF image appearing that only add the "all" filter.

Main points

- Would like a zoom in option / ability to change the objective
- She likes that you have to load the sample and adjust the controls - this is more like real life
- Experiment setup - would be cool if you could try to do it here - put in different amounts of dyes / antibodies, etc. 7.06 is pretty experimental based, so that would be learning

Overall Thoughts

- Pretty intuitive - better than StarGenetics

Usability Test #3

Tuesday, June 3 @ 2 pm

female, graduating senior

Course 6/7 (mostly 6 = computer science)

Took 7.06 in Fall 2013

Took 7.03 in Fall 2012 (yeast problem)

PC User

She was able to create her student account ok

Was able to navigate to the microscopy usability assignment

Prefers to read her assignments on the computer - not printed out

Design page

- felt that she was supposed to fill it out because it's part of the experiment progression - just

Experiment Setup page

- Add Samples window is not formatted as nicely as on a Mac
- copy icon was not intuitive and tool tip took some time to show up

Microscopy Technique

Setup page

- Was expecting a checkbox next to "Select" heading in the table
- Was ok with drop down menus in the setup table
- radio buttons in the table look not applicable to her, not unselected
- On a PC, the text/font in the drop down menus is not formatted nicely

Analyze

- used the navigation arrows over using her cursor to move the image around the lens
- used the focus controls
- Navigated through all of the samples and focused them all
- Figured out the IF image and navigating between filters - we think the laser was on from before
- **Bug: focus was disabled with IF image and different filters**

Overall Comments

- Likes that are given real images and practice analyzing them
- Hard to give people a sense to how long this experiment takes
- Thinks that it's not as good at teaching students how to design an experiment, but it is good/better at teaching students how to analyze images

Bonus Round: Flow Cytometry analysis tools

scbdev.mit.edu

StarCellBio Usability Test

Comments

Experiment Setup

- no need for create new setup radio button

Flow Cytometry Analysis tools

- Figured out the single gate tool
- Bisector gate - didn't work for her - may be a PC bug
- It was hard for her to select the buttons sometimes
- would expect the single gate button to always be selected once it's selected once

Overall Comments

- SCB makes biology seem too easy

Usability Test #4

Wednesday, June 4 @ 9 am

Female, graduating senior

May have done user testing for us before in the usability lab

Took 7.06 in Fall 2013

Has done western blotting before

Logged in just fine

Assignments page

- Would like the points in the introduction to be a numbered or bullet point list
- The introduction does a better job of describing what she has to do over the question

Design page

- doesn't like that she has to remember the information from the previous assignment page. Hard to fill this out without the assignment in front of her. Would like to print out the assignments page or have it open in a pop up window.
- The information about all of the three experimental techniques is irrelevant because only have microscopy for this assignment
- Also, expect the whole text to be a link since it turns to a hand cursor

Setup page

- Selected all the samples
- Can't edit the setup afterwards - like the real lab but it seems artificial for the software program

Microscopy setup page

- Doesn't like that she has to select Dye/Stain for all samples since there is no select all link. Can you apply the same analyses to all samples?

- Thought it was strange that some samples have different analyses
- All samples appear the same in the window and hard to keep track of them. Number the samples in the window? Or show all of the samples?

Microscopy Load page

- Can manipulate the controls but didn't load the slides yet.

Microscopy Analyze

- Hates focusing the lens in real and simulated life. But does think this functionality is cool, just like real life.
- Likes how the focus is saved once the focus is set (when switching between samples)
- Can't distinguish between course and fine focus - label the course and fine focus
- Different objectives across samples is confusing to her since she can't change the objective
- Doesn't want control images to be the same across samples
- navigated between microscopy analyses ok - with different tabs
- Unsure of what she is looking at in the images and unsure of how to interpret the IHC images - needs images of same analysis across all samples
- **Bug: flashing green lights appeared on two of the black and white IF images (red and green filters)**

Overall Comments

Microscopy

- Liked how she can drag the image across the lens
- Brightness is intuitive
- Looks like you can't click "off" switch when the laser is on
- would like the objective to be changed - especially if the objectives are not consistent

BONUS ROUND

scbdev.mit.edu

Flow cytometry analysis tools

Flow Cytometry Analysis

- Histogram data was unexpected at first. She has seen flow cytometry graphs in 7.06 before - but used dot plots in that course

Bisector gate:

- instructions should say that you need to click in the graph
- unexpected at first - thought she would click and drag to set left and right bounds and then to set the middle
- can't adjust the left and right sides of the gate

Single gate:

- worked just fine

TO DO

Overall Design

- Change the design of the unselected radio button. The gray unselected radio button looks like it's not an option Won't take long, but will need to know new design. Can I see what a black outline with white background looks like? This looks great!

Assignment

- Add in information about looking at lung tissue slides **Adding the words won't take long, once I know what they are**

Setting up student account

- Need to go to email and click on it to be able to log in to the account **Will take more than a few hours, perhaps half a day, to fully test**
- Sign up window text isn't formatted appropriately on the PC. The text extends into the scroll bar region. **Will take a few hours. Low priority**

Design page

- Cursor changes to a hand cursor when hovering over the text describing each of the three experimental techniques, but should only be the hand cursor over the learn more link. Take a few minutes. High priority
- Show only the available experimental techniques here? Take a few minutes. Low priority - if time If only two experimental techniques are shown, then the vertical line to the right of the second technique does not need to appear. Done **I don't see this change.**

Experiment setup page

- Eliminate "Create New Setup" button as it's the only option. The instructions will just appear when you get to this page and the text will need to be moved up appropriately. Take about an hour. Priority if time. Eliminate the green horizontal line and move the instructions up so that the top of the instructions is in line with the top of the dark gray box in the 'in the lab' feature. Done
- PC: add samples window isn't formatted nicely **Will take a few hours. Low priority**
- Bug: The copy button isn't working appropriately. It is duplicating the last duplicated sample and also replacing the original sample as well. Done

Microscopy Setup Page

- A new analysis drop down menu should not appear when there are no more options Will take a few hours. High priority - this applies for flow cytometry and microscopy. This is working beautifully for microscopy, but was not in effect on the flow cytometry (usability test2 assignment). Also, the setup table in the usability test2 assignment is not formatted in the same way as the microscopy setup table - with dark horizontal lines between samples and faint horizontal lines between analyses for the same sample. Done, but it is working for me for flow cytometry

- Add in a warning if a user selects an analysis but doesn't select a condition. Ask: A condition has not been selected for at least one of your samples. Would you like to continue? Yes/No. **Will take a few hours at most, might take less time. Low priority**
- Number the samples in the table on the setup page? Or format the table to show all of the samples in this window? Take a few minutes. Low priority - I would like to number the samples but am concerned that it will be confusing if the samples are numbered in this table and then re-numbered on the next page. This would also mean that we would have to number the samples on each of the experimental technique pages. - After reading Katherine's report, I think we need to make the sample window on the microscopy setup page not scrollable and show all of the samples at the same time. (High priority) Done
- Bug: 7.06 assignment 2: Only one analysis is available in the drop down menus, and after selecting the analysis, the radio buttons do not appear in the conditions column.
- Bug: 7.06 assignment 1: When clicking select all, or selecting samples in the sample window, the text in the analysis and conditions columns does not become black, but stays gray.
- Bug: 7.06 Assignment 2 (and maybe others as well): The second "Select Analysis" drop down menu is not disappearing once the first and only analysis/condition is selected - for me it's sample siRNA #1.

Microscopy Load page

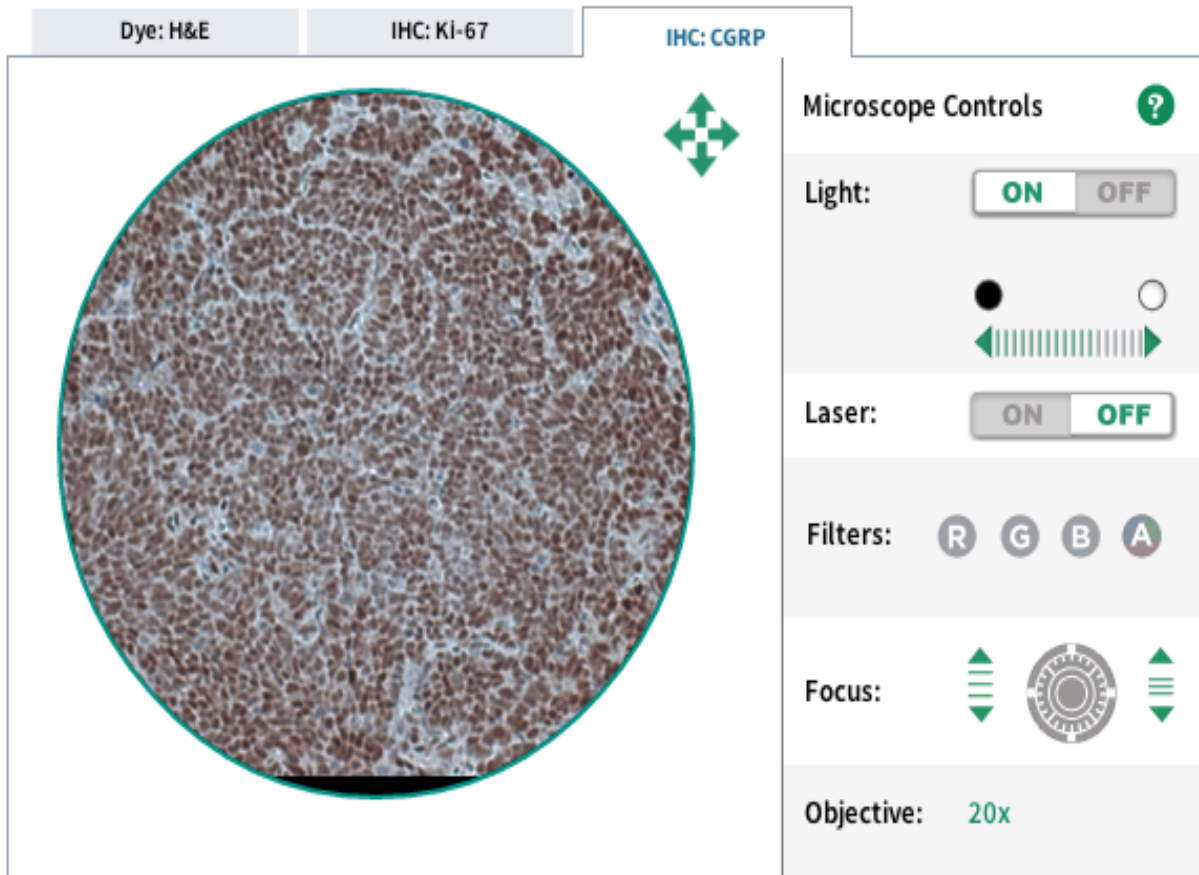
- Sample names appear in gray until "Load" is selected OR eliminate the Load button entirely Will take a few minutes. Answer pending response to bullet point below. I think that if you can gray out the entire small tabbed window (see comment below), then we can leave the samples window as is. Done
- Inactivate microscope controls before slides are loaded Will take a few minutes, but will need pictures for disabled buttons (laser and light). Instead of having a different laser on/off switch, can you make the right side of the window opaque until the user selects "Load"? This is more similar to the flow cytometry experimental technique, where we don't have trouble with students running the samples. Then once a student selects "Load" then the right side of the window with the microscope viewfinder and controls will be in view. Depending on your response to this, then I will decide about the Load button (above). Even though the microscope controls are all grayed out, the entire small tabbed window needs to appear grayed out (just like in the flow cytometry experimental technique) - including the microscope lens and the small tabbed window label and even the outline of the small tabbed window (i think). Also, when hovering over the microscope controls when they are grayed out, the cursor should not change to a hand. Done Did you say that it is hard to change the cursor away from a hand in this state? Done I don't see this change, but it's currently working like the flow cytometry technique where you get the hand cursor when hovering over a button even in this grayed out state, so I'm ok with it. Oh, I see the change now. Can you fix this for flow cytometry as well (if it was "easy")? I still get a hand cursor when hovering over the "Analyze" button even before "Load" is selected.
- Think about whether we still need the error message that the slides have been loaded - To remove it will take a few minutes, to move it somewhere else will take an hour at most, but we probably need it to let the user know how to interact with the lens and which functionalities are working (brightness and blur). - Let's leave it for now. I think that the problem with the error message, is that users don't realize they have to clear it before they can do anything else. That either means that we gray out everything except for the message until they clear it, or we allow them to click on other samples while the message is still up. (It also looks like they can click other things because the cursor changes to a hand when hovering over other samples and the microscope controls.) - Done

Microscopy Analyze

- Inactivate laser button and laser filters unless on an immunofluorescence image. Then have the lasers are not activated until the laser is turned on Will take an hour at most, but will need images

for the inactive laser switch. High priority. I'll ask Jamie. I think that you can put in the inactive filter images now while we are waiting for the inactive laser switch. Is that correct? Using the grayed arrows on low opacity and switch to bright when enabled

-
- Inactivate filter images unless on IF image. Done
- **I don't see an inactive laser on/off switch when looking at an IHC image in the microscopy usability test: There is a difference between inactive and disabled. Inactive means the switch is off and disabled means you cannot move the switch at all and it is not functional. Do you want the filters and laser switch to be inactive or disabled? I would like them to be disabled. The filters are already disabled (grayed out) and the laser on/off switch should be too.**



- Have the laser automatically turn on for IF image (and then off again when switch back to a bright field image) - If the laser is always automatically turned on, then what is the purpose of the switch at all? To make this change, would only take a few minutes, but if it will always be automatically turned on and off accordingly, then it really doesn't require user input, so the switch should go all together, and be replaced with a state, like objective, saying 'laser on' or 'laser off'. - High priority. The user can still turn the laser off, but then they're not confused about whether the image hasn't loaded or if the microscope controls aren't correct. - Should I do the same for the light switch? - What do you mean? Do you mean that the light switch should automatically turn on when viewing a bright field/IHC image? If so, then yes. - This is working appropriately. - Done
- When looking at an IF image, use the disabled light switch. **Strange - it looked normal to me until I clicked on the light switch to turn it off. Then it switched to the disabled light switch. (I had just created a new student account and everything.)**

- When hovering the cursor over a disabled light or laser on/off switch, can you show a normal arrow, not a hand cursor?

-
- Bug: when you are viewing an IF image, the laser automatically turns on, the light stays on but the brightness automatically decreases. However, if the user adjusts the brightness, it should bleach the entire image out until the whole image looks white. I think this used to be working. **I feel like this needs to bleach out to white (the entire image, not just the bright spots on the image) by about half way on the brightness scale. If the light switch is on while the laser is on, you really can't see anything. I should discuss this with you**
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- Change cursor to a hand when hovering over the lens to indicate that you can drag the image across the lens. Take a few minutes. High priority. The cursor should only change to hand when hovering over the image in the lens. Done
- Some of the images are taking a while to load. Incorporate an error message? Will take some time, half a day at least. High priority. Need to test some more but see if it works. Can you have all of the images load when the user clicks Load? No, otherwise it won't be randomized. Alternatively, I think that you need to add a progress bar in the error message to let the user know how long it is going to take. The message flashes up on my screen almost every time I switch samples, but it flashes up so quickly that I can't read it. Maybe instead of the message, we can just use a progress bar? (I'm just trying to brainstorm ideas here). - Let me ask Ivan about this one... - I'm on a slow internet connection right now in NH, so it's a good test for a slow internet connection. The error message frequently comes up and stays up long enough for me to read it. But sometimes the error message disappears but the microscope lens is still black. To see the image, I select another sample and then switch back to the first one and it's there. Interestingly in these times, whatever the next image is that I click on (although always a previously unloaded image), the image is loaded right away and no error message appears as if the program was actually loading more images at the same time. I feel like a progress bar would be really useful here. And also when on a fast internet connection, the error message shouldn't even appear until the program has tried to load the image for 2 seconds. - I think I fixed it so no error message is needed. Test it on slow connections and let me know. I've tested it with Wifi and Ethernet on my machines and it seems to work. - This isn't working for me (7.06 assignment 2). None of the images are loading. Things are also working really slowly for me. I'll click on another sample but the same mini-tabs for the previous sample will appear. As a result, when I click on a mini-tab, it automatically takes me back to the previous sample in the Samples window. I won't be back in NH where I can easily test the slow internet connection until the July 4th weekend. I can test it then, if you try to remind me. - Done - Ok images are loading for me and things seem to be working now.
- Fine focus - make the changes to the fine focus a little bit more obvious? **If I make the fine focus more prominent, then it is not very fine, because it would be quite close to the rough focus. But making this change would take only a few minutes. Low priority - leave as is for now**
- Try to minimize use of the same images across samples - particular for controls (Mainly a note for L/A, but is there something we can do so that the same image is not selected twice, when possible, from a folder of images?)
 - - - Will take some time, more than a half day.
 - - Lower priority.

- - Depending on time, I may make this high priority so that images are not re-used when plenty of images are available. I think that I would like to prioritize this, if possible.
- - If the randomization picks an image that has already been used for this microscopy it will continue to rerun the randomization until a new image is picked. If all the images have been used, then it just picks at random from the set of images, since it will inevitably be a repeat.
- Note for L/A: Need to have images of same microscopy analysis across all of the samples as much as possible Depends on the images. I can input the images, but it will depend on the images provided themselves. If this refers to matching the images across different techniques for a sample, then it will take some work, more than day at least. This is a note just for Lourdes and myself.
- **I forgot to include in here a zoom feature. An alternative is that we provide some other objectives for users to switch between, but I think that just having a simple zoom in and zoom out with a few adjustments in each direction would be really helpful. We will need to talk about this. This will mean interface changes (now we need a zoom button/gestures). I also need to know to what degree the zoom can go. Also I need which images can zoom (for example, an image that starts out as 150x150 can't be zoomed in, since it is already enlarged for the lens, and increasing the size would only make it look pixelated. If the image is originally 1500x1500, for example, then we can zoom to a couple degrees, since the original image was larger than the lens and therefore the lens image can be made larger without losing too much resolution).**

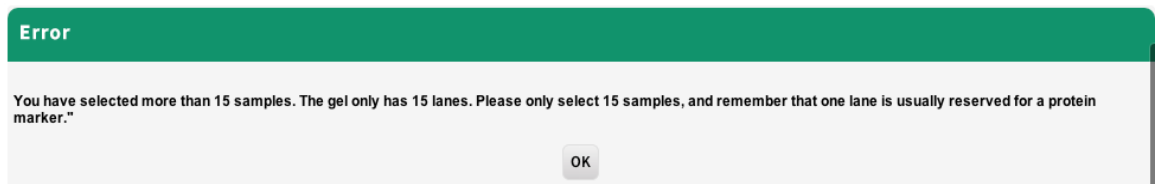
Bug: focus problem with IF image and different filters Need to test, will take half day at least. High priority

Bug: only got a black and white IF image appearing that only add the "all" filter Need to test, will take half day at least. High priority Not able to recreate. I've tried it many times with every combination; I'm not able to get this error again. If you can get it, let me know. I couldn't recreate this.

Bug: flashing green lights appeared on two of the black and white IF images (red and green filters) (PC) Can't change this, it is not a bug in the program but with the browser.

Western blotting

- **Bug?: Sample numbers are changing as you re-order the samples? Will take more than a few hours, half day at least. Low priority**
- If you select more than 15 samples on the setup page, the error message that appears is strangely wide. Can you format it to be equal to the other error messages and also remove the quotation mark at the end? **I still see the quotation mark at the end. Can you remove it? Also, when I click "ok" the original really wide error message flashes up on the screen.**



Flow Cytometry Analysis Tools

- Add tool tips on the buttons Will take only a few minutes but I need to know which buttons. High priority. For the single gate button, tool tip should say: "Single gate", for bisector gate button, tool

tip should say: "Bisector gate". - These tool tips are formatted differently than the other tool tips in the program. Can you format them the same way? - Done - They look close enough now, but I'm assuming that you are making these tool tips yourself rather than using the operating system tool tips? Will this be ok for accessibility? As long as the contrast is dark enough, and I add an accessibility tag, then it should be okay. Since I used the same colors as the other tooltips the contrast should be okay. **Just out of curiosity, why do you have to generate these tool tips yourself?**

- Increase size of the clickable area on the analysis tool buttons Will take a few minutes High priority.

Bug: bisector gate didn't work on a PC

General Navigation

The program is taking me to the bottom of a page that I haven't viewed before when it should take me to the top.