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%Calculate Redox Ratio
%Adapted from Quinn Lab
%By: Shelby Bess
%Date: April 4, 2022

% Load images
nadh = imread('06-755-006-Ch3-16bit-Reference.tif');
fad = imread('06-855-006-Ch2-16bit-Reference.tif');

% Load image metadata
nadh_meta = xml2imagedata('06-755-006.xml');
fad_meta = xml2imagedata('06-855-006.xml');

% Get the values necessary for fluorescein normalizing images. These values
should be loaded appropriately, but are hard coded here.
pockels_755 = [50,62,80,70];
power_755 = [71.3,87.82,110.9,98.3];
pockels_855 = [30,45,60,51];
power_855 = [56.22,85.44,109.8,94.3];

% Normalize images
nadh =
fluorescein_normalization_master(nadh,nadh_meta.pmtGain.PMT3_Blue_,pockels_75
5(end),'-obj',pockels_755,power_755,nadh_meta.date,'-i');
fad =
fluorescein_normalization_master(fad,fad_meta.pmtGain.PMT2_Green_,pockels_855(
end),'-obj',pockels_855,power_855,fad_meta.date,'-i');

figure; imagesc((nadh+fad)./2);
title('Average fluorescence intensity'); colormap gray; colorbar;

[orr,avgFluorescenceORR] = calculateRedoxRatio(nadh,fad);
fprintf(['Average fluorescence redox ratio for whole image:
',num2str(avgFluorescenceORR,4)]);
figure; imagesc(orr);
title('Optical redox ratio'); caxis([0 1]); colormap jet; colorbar;

mask = imread('Mask.tif');
mask=double(mask);
[~,avgFluorescenceORR] = calculateRedoxRatio(nadh,fad,mask);
fprintf(['Average fluorescence redox ratio within ROI:
',num2str(avgFluorescenceORR,4)]);
figure; imagesc(((nadh+fad)./2).*mask);
title('Masked ROI'); colormap gray

[colorORR,cmap] = createColorORRMap(orr,(fad+nadh)./2);
figure; imagesc(colorORR);
title('Colored ORR image'); colormap(cmap); caxis([0 1]); c =
colorbar('Ticks',[0 1]);

Error using imread>get_full_filename
File "06-755-006-Ch3-16bit-Reference.tif" does not exist.

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Error in imread (line 372)
    fullname = get_full_filename(filename);

Error in Redox (line 7)
nadh = imread('06-755-006-Ch3-16bit-Reference.tif');
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