

Multi-color Fluorescent Microscope

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Microscope Optical Path Design

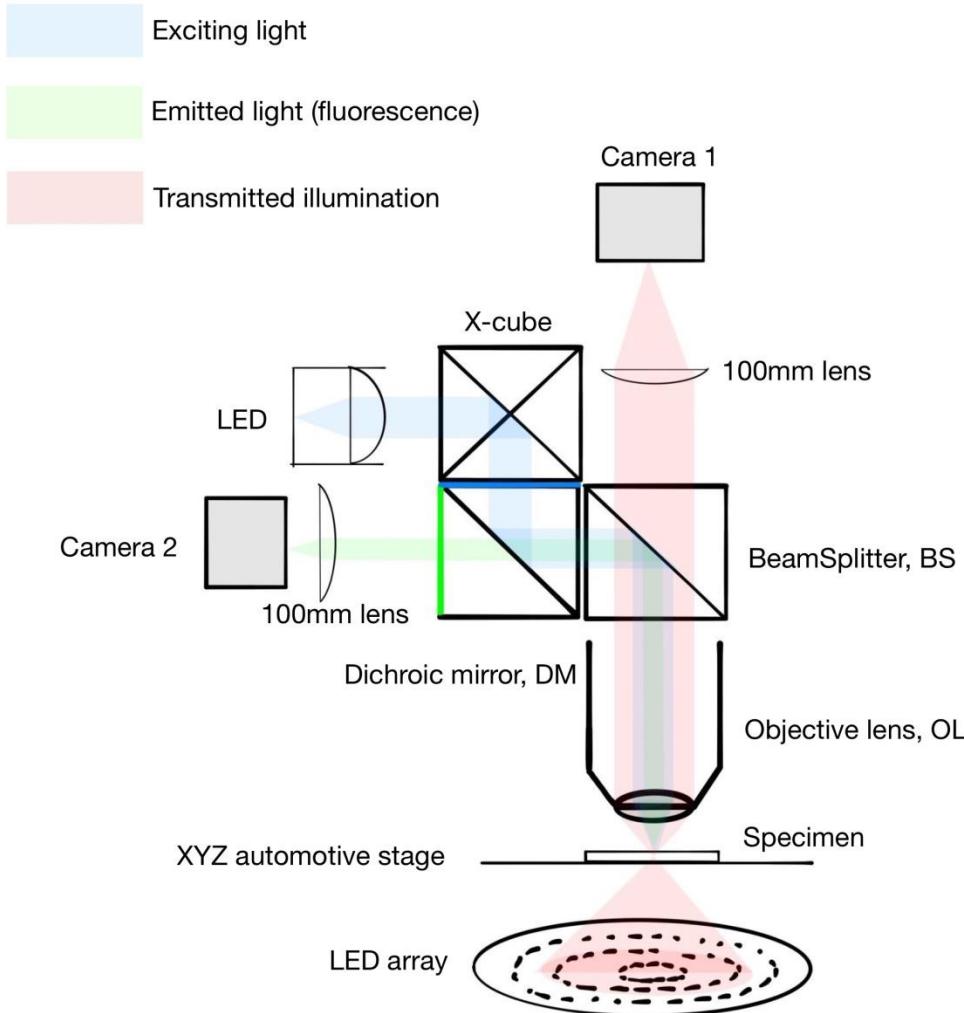


Figure 1. Schematic diagram and elements' name of the optical path design of the electric platform fluorescent microscope.

Microscope Optical Path

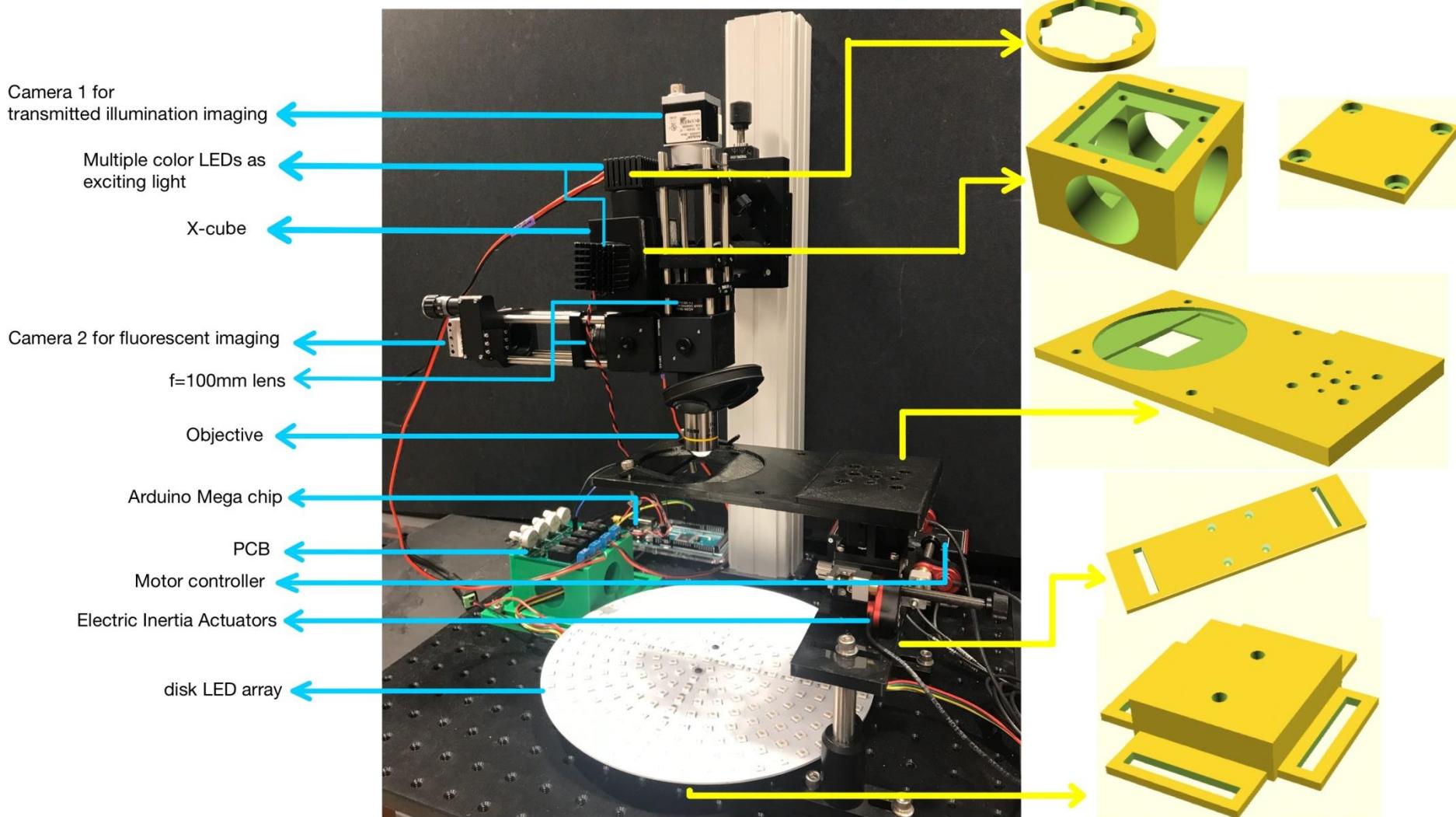


Figure 2. Photographs of the electric platform scanning fluorescent microscope together with 3D printed parts required.

Multi-color fluorescent illumination system

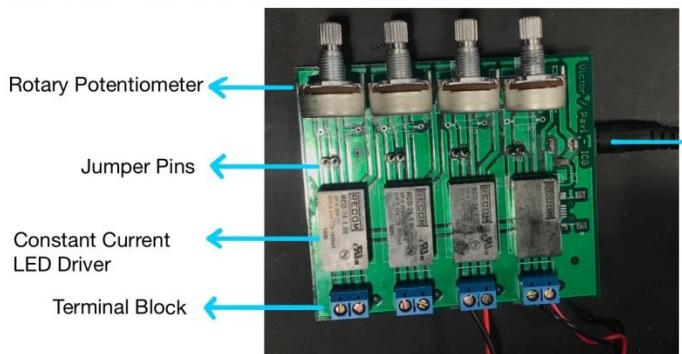
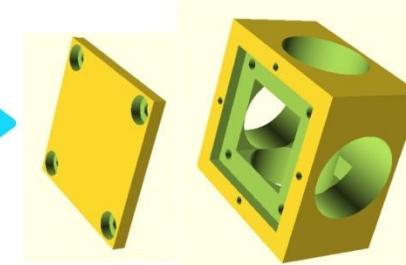
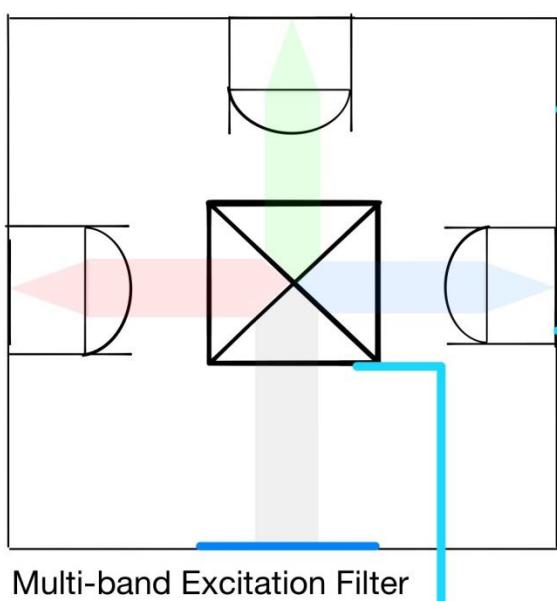
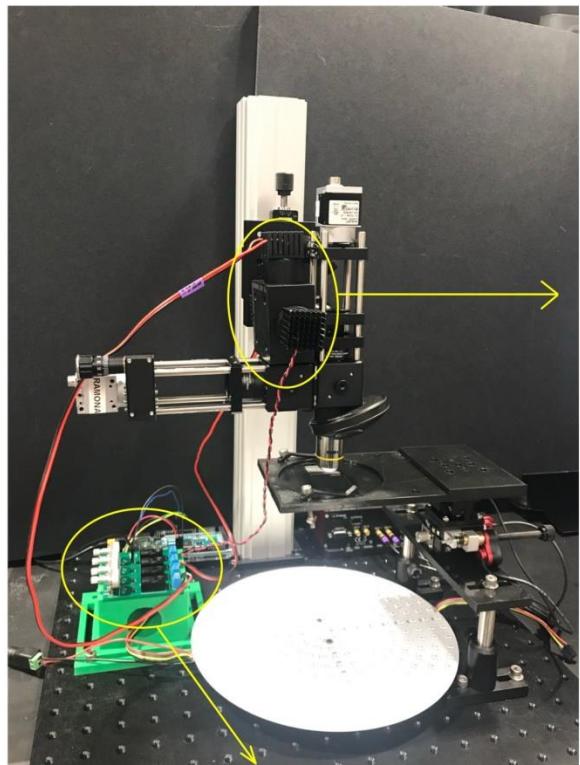


Figure 3. Photographs of the printed circuit board and single LEDs for multi-color fluorescent excitation.

Spectrum of fluorescent illumination system

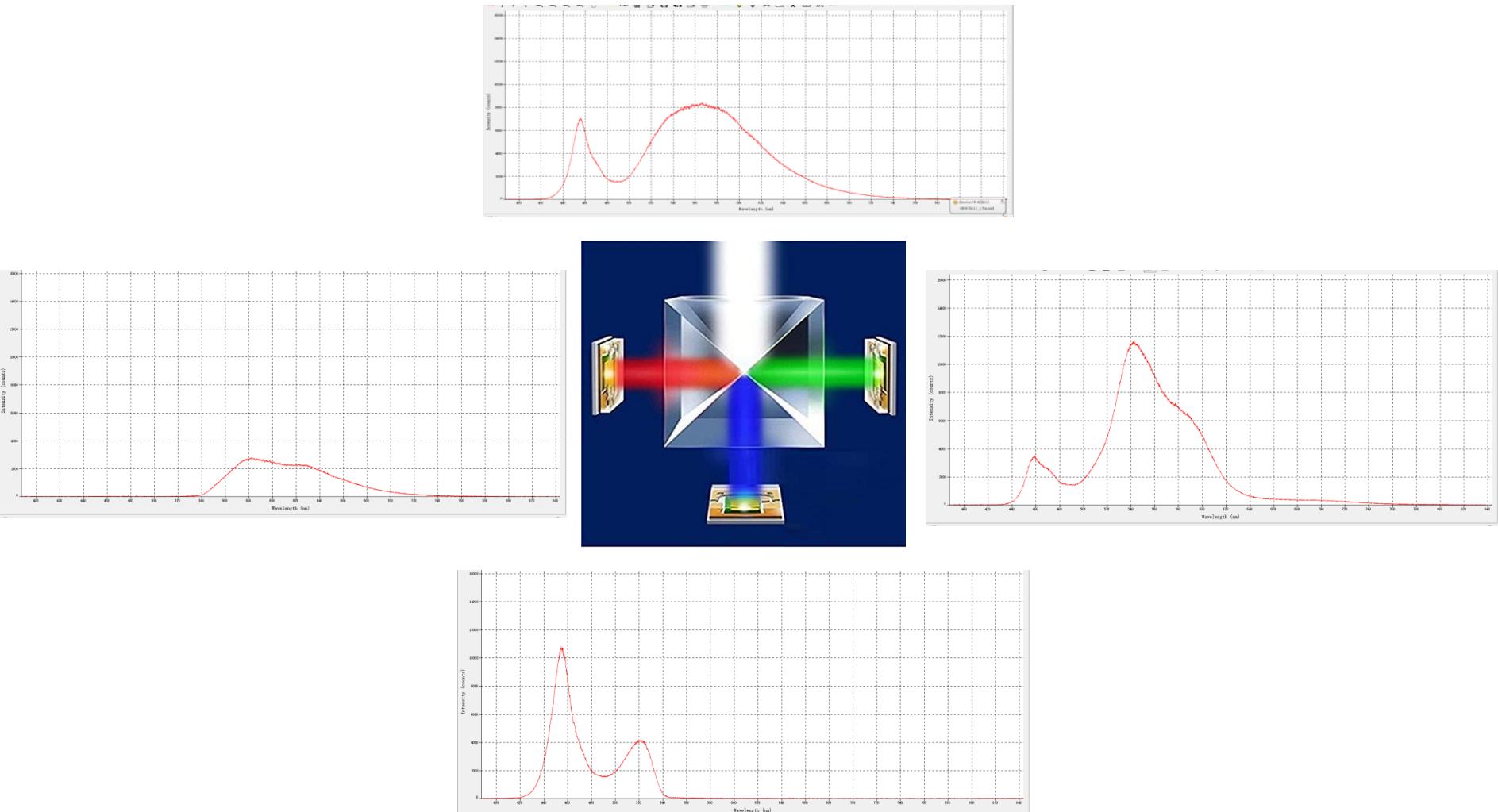


Figure 4. The white light incident from one side of the x-cube is dispersed into red, green and blue. The spectral distribution of the three sides are measured respectively.

Multi-color Transmitted illumination system

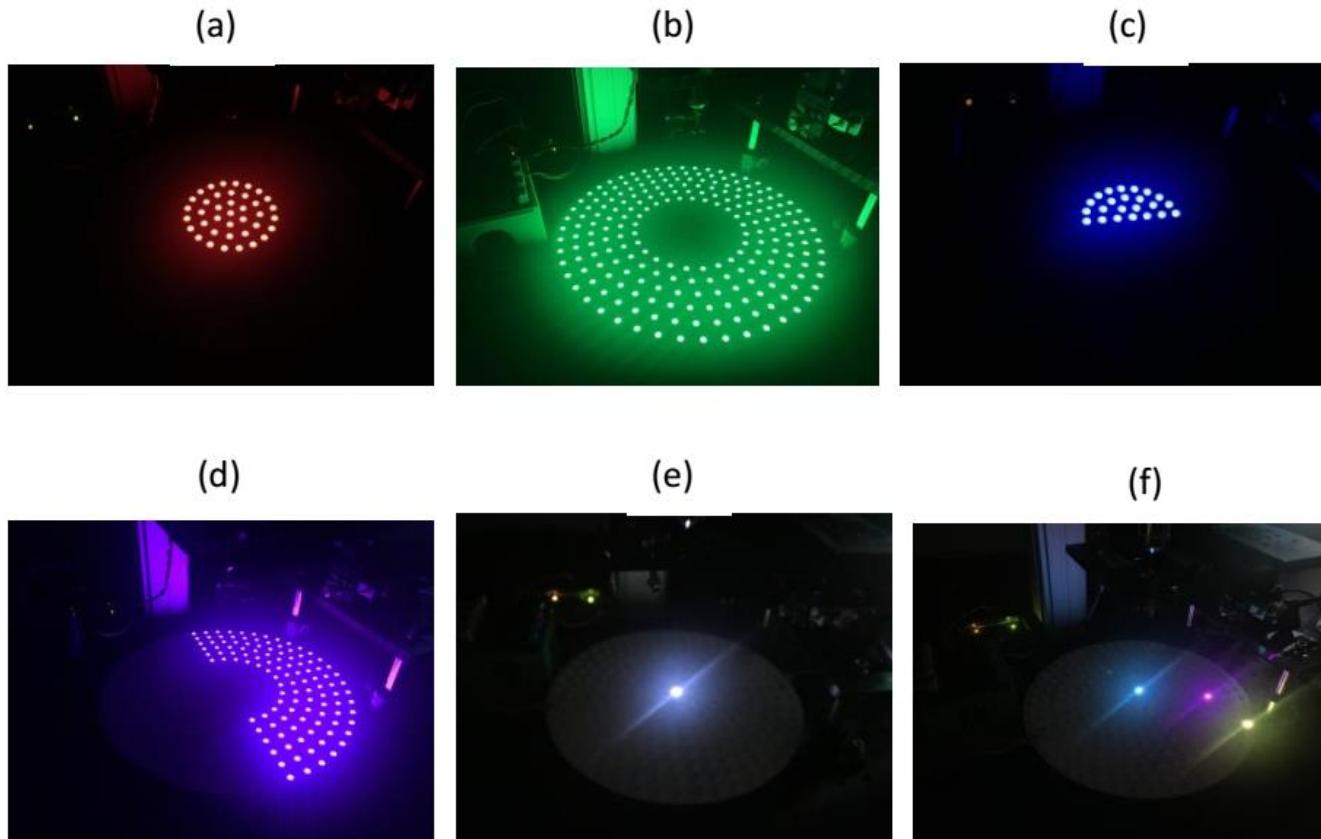


Figure 5. Transmitted illumination system achieved by disk LED array. (a)bright field illumination. The diameter of the field is automatically calculated by the NA and distance parameters set in the code. (b)dark field illumination.(c) phase contrast illumination (bright top). (d) phase contrast illumination (dark right).(e)single point illumination. (f) multiple point illumination.

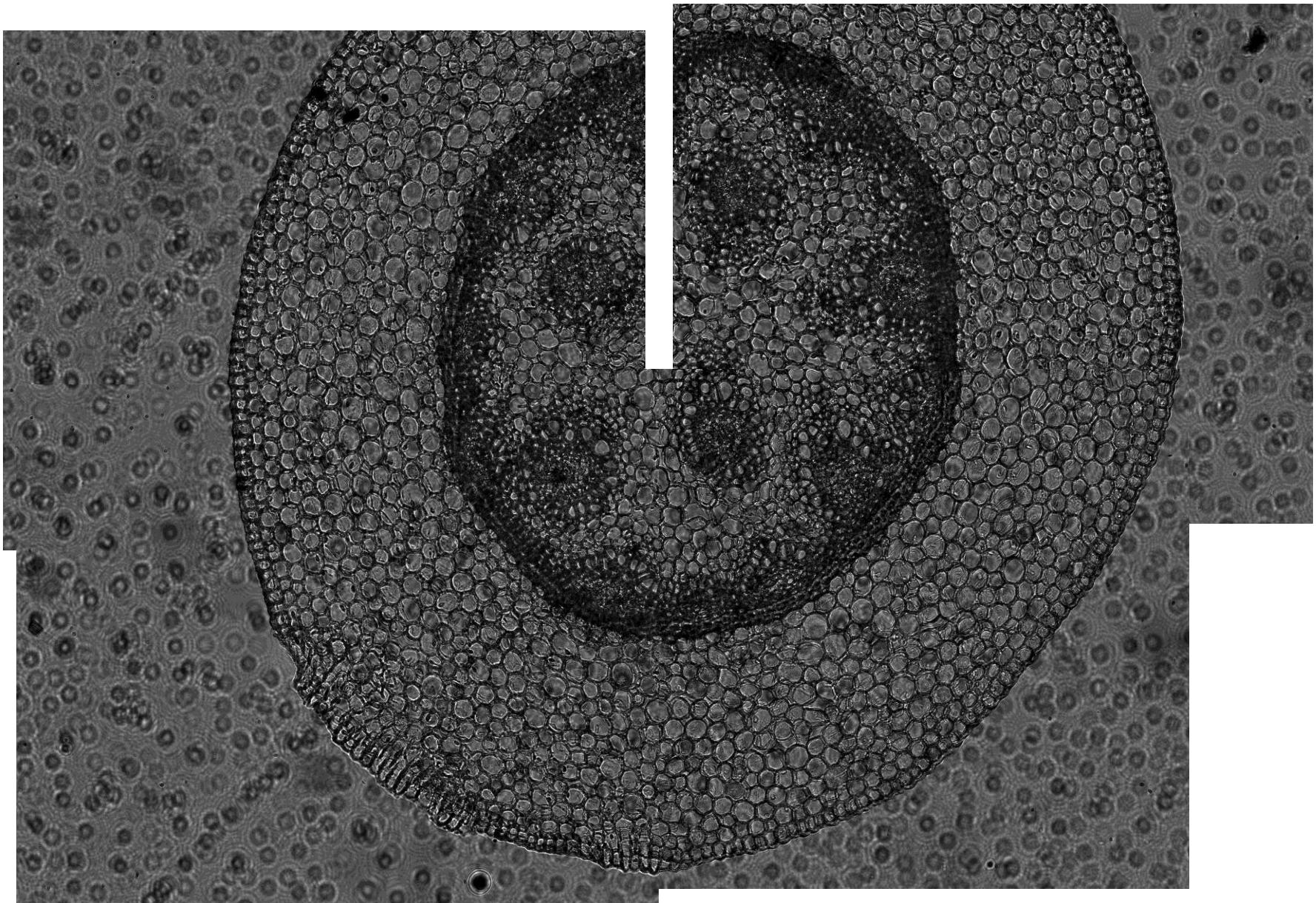


Figure 6. Scanning Transmitted central point illumination(green) imaging of convallaria.

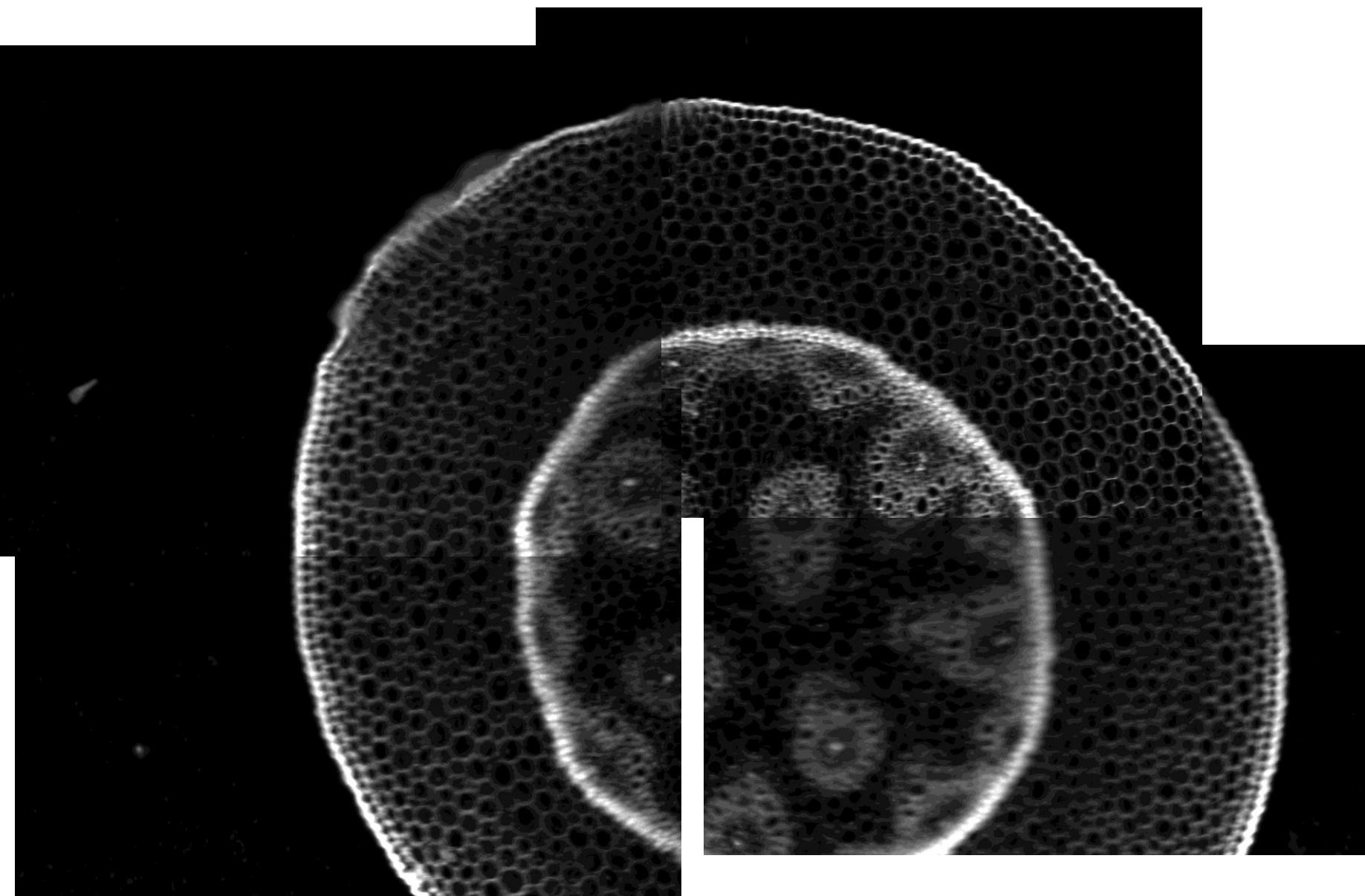


Figure 7. Scanning fluorescent imaging of convallaria.

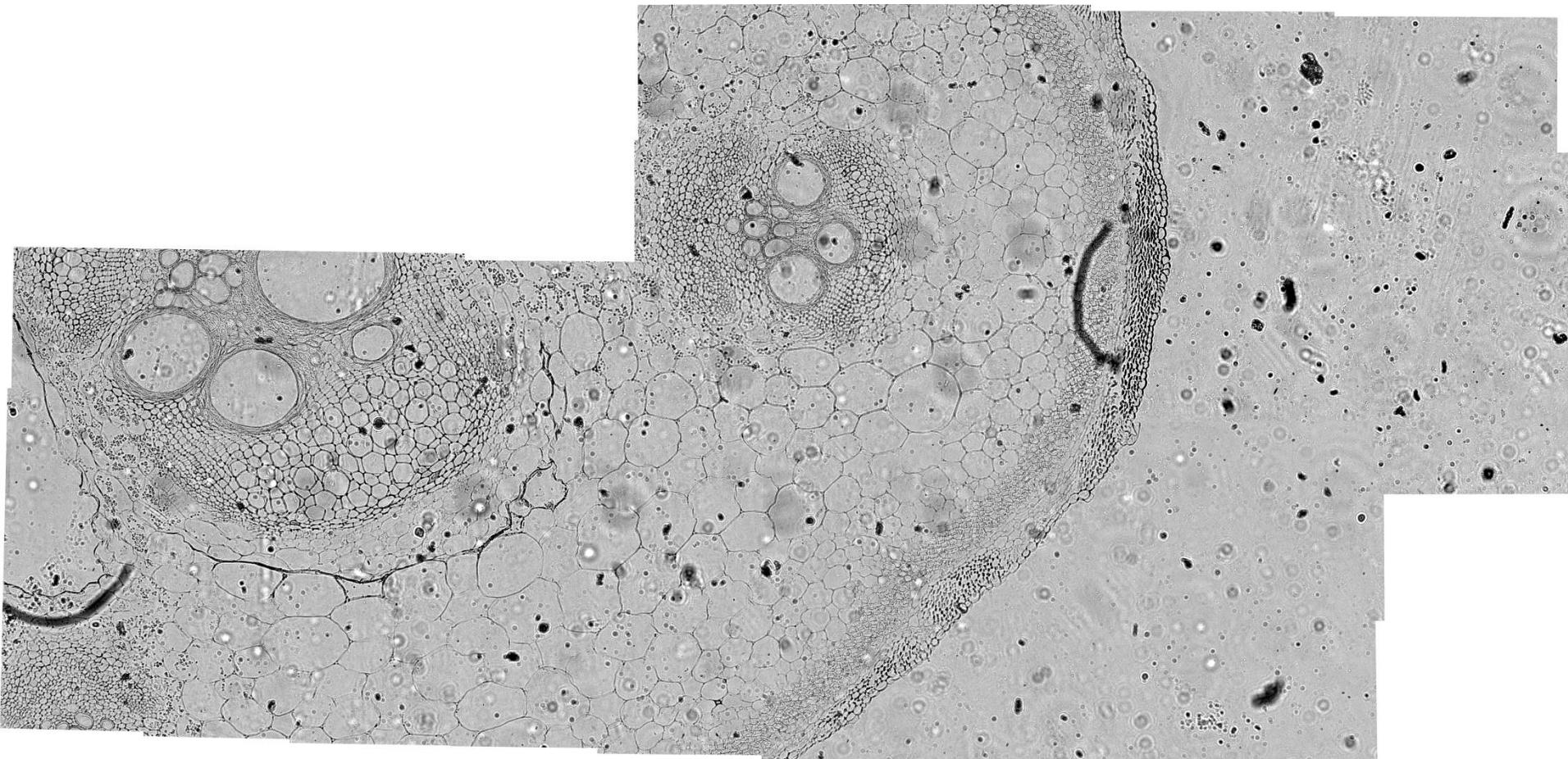


Figure 8. Scanning Transmitted central point illumination(green) imaging of pumpkin stem, a larger sample.

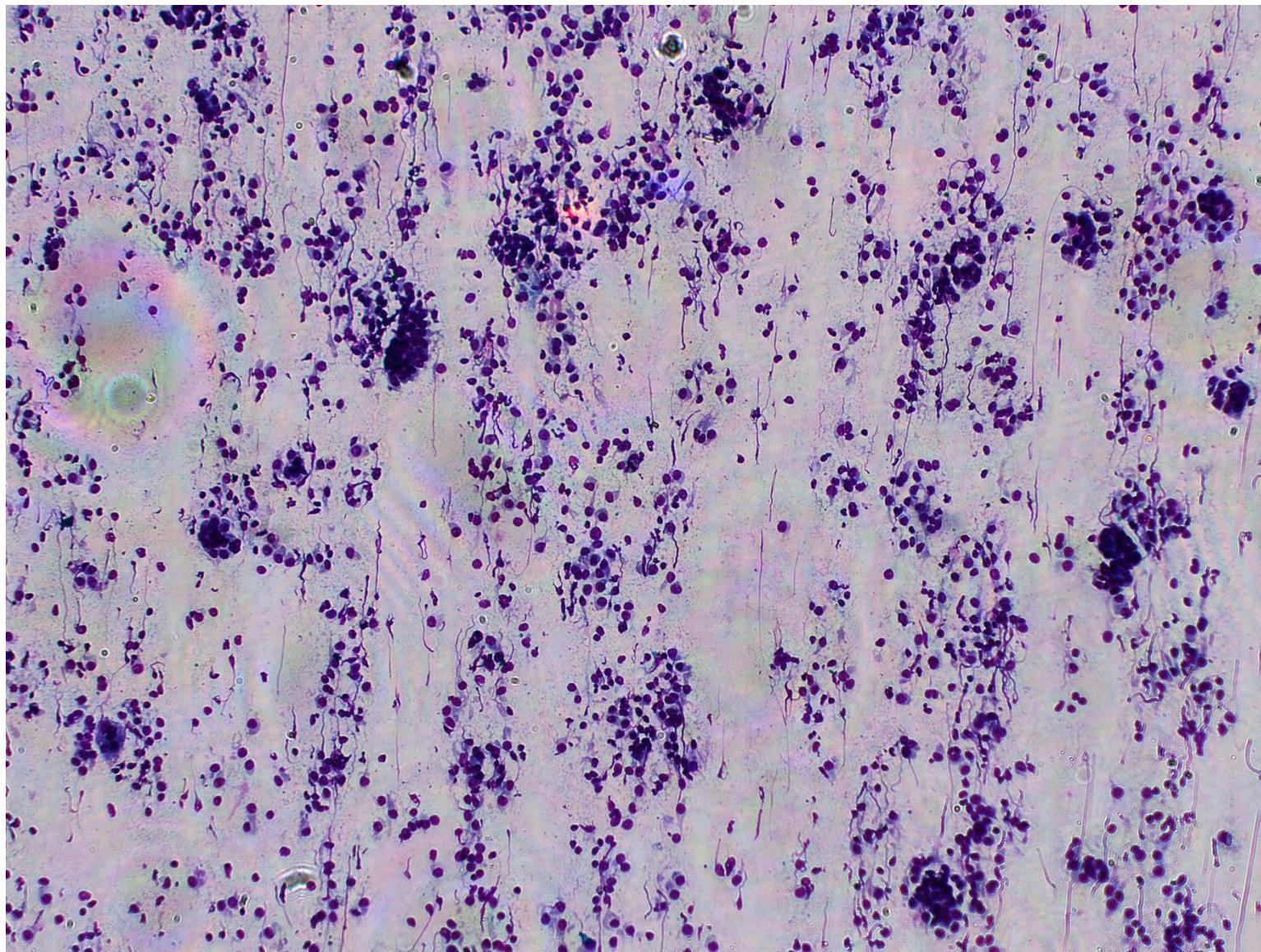


Figure 9. Bright field RGB illumination image.



Figure 10. Dark field RGB illumination image.

Imaging Biological Sample by MCAM

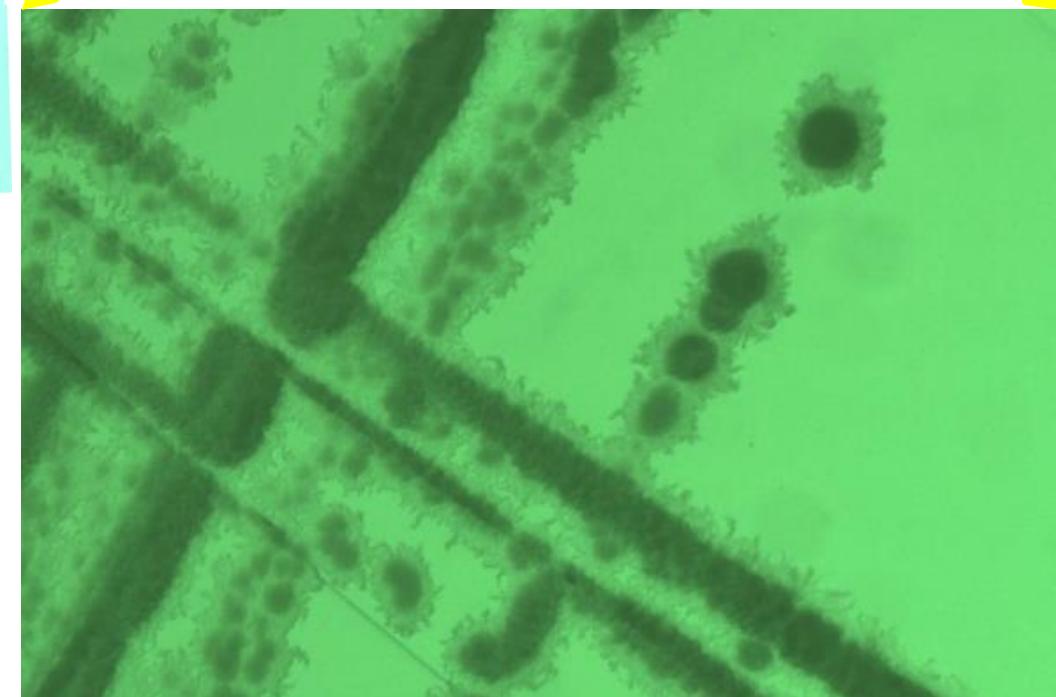
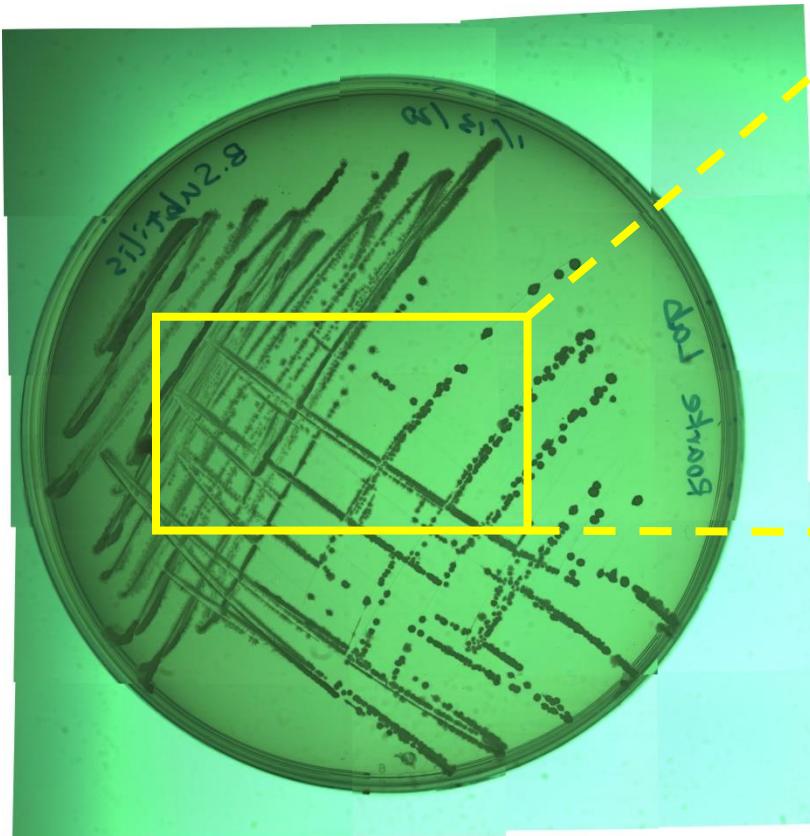


Figure 11. MCAM images of *B. Subtilis* on small plate.

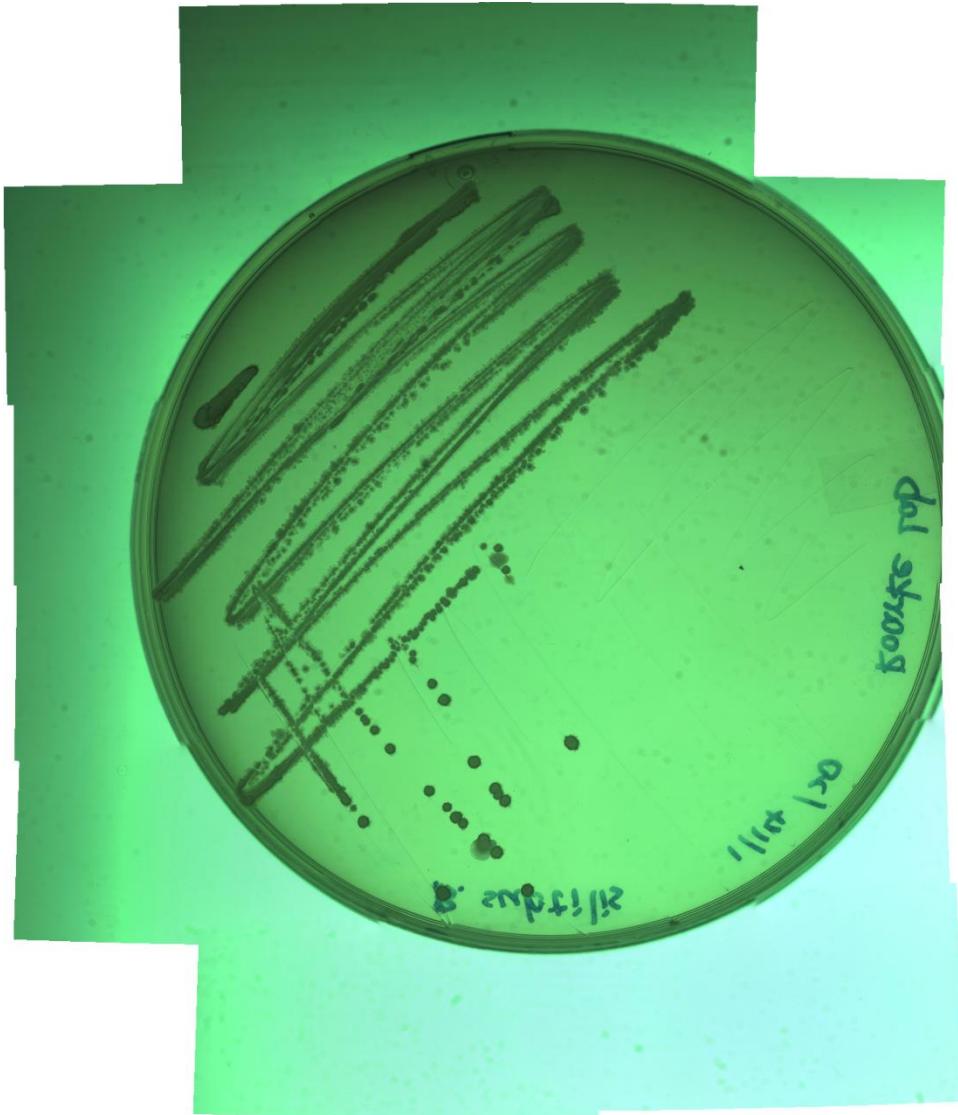


Figure 12. MCAM images of *B. Subtilis* on small plate.



Figure 13. MCAM images of E.coli and B.Subtilis on large plate.

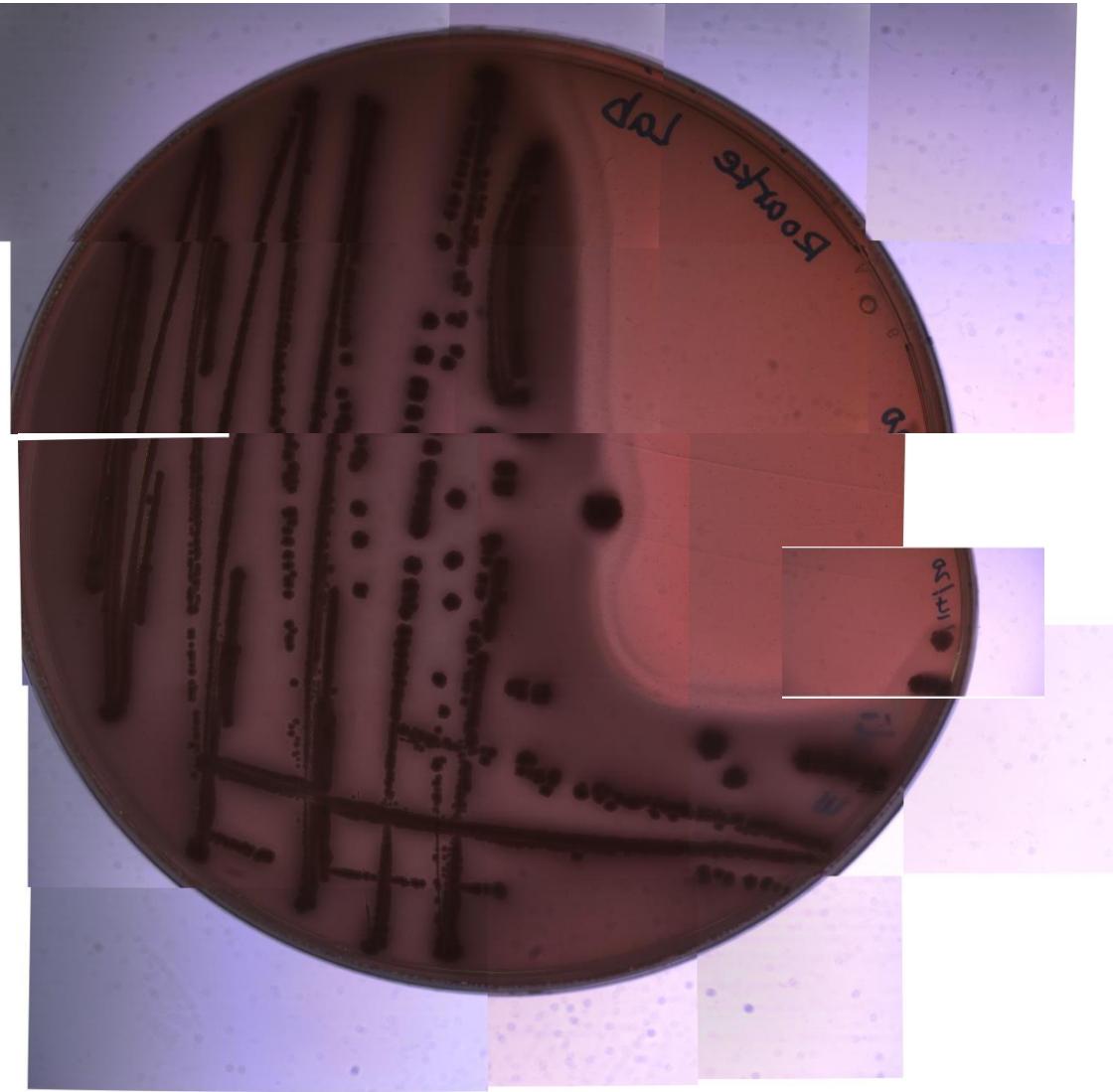


Figure 14. MCAM images of *E.coli* on small MacConkey plate.

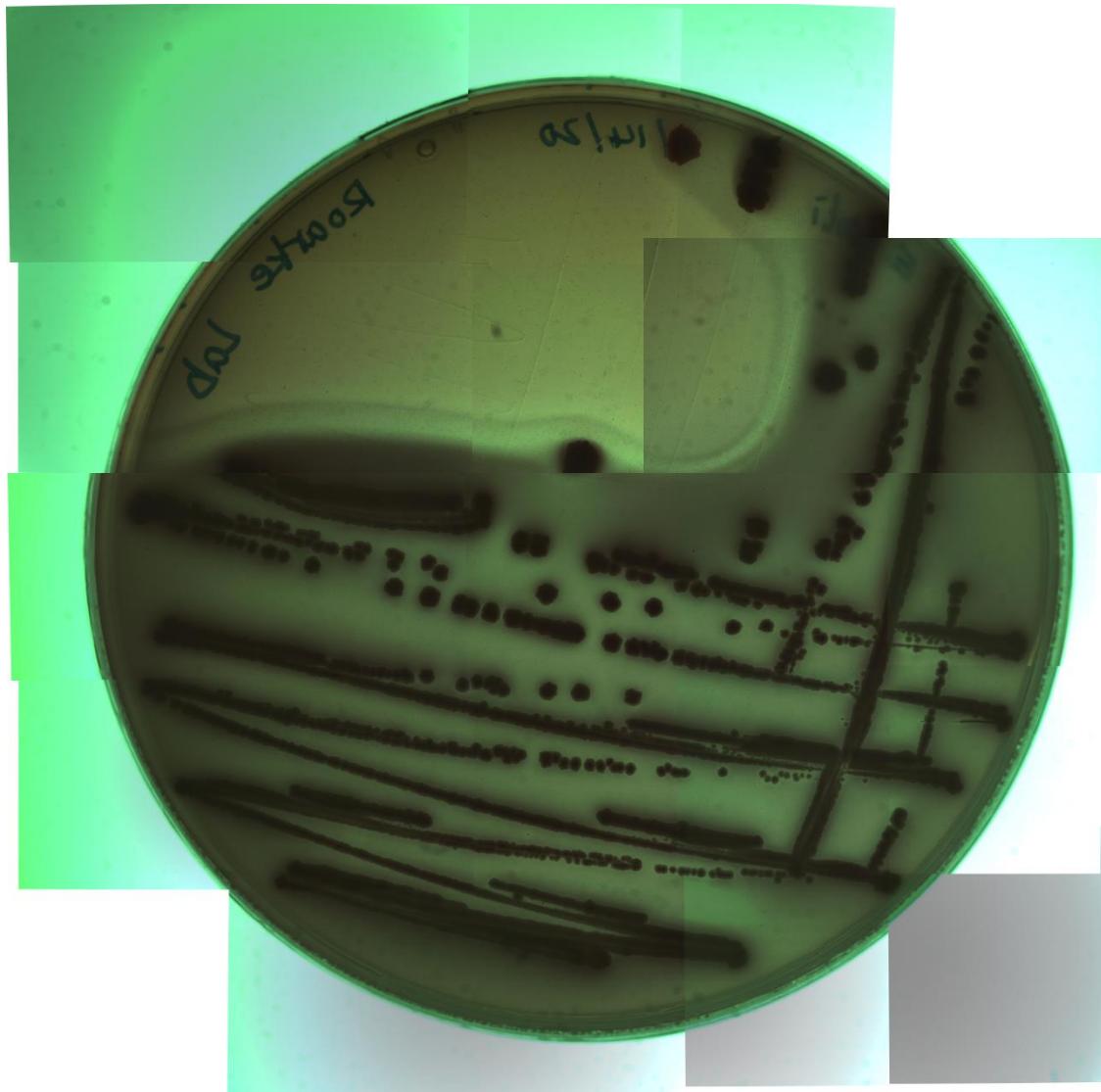


Figure 15. MCAM images of *E. coli* on small MacConkey plate.

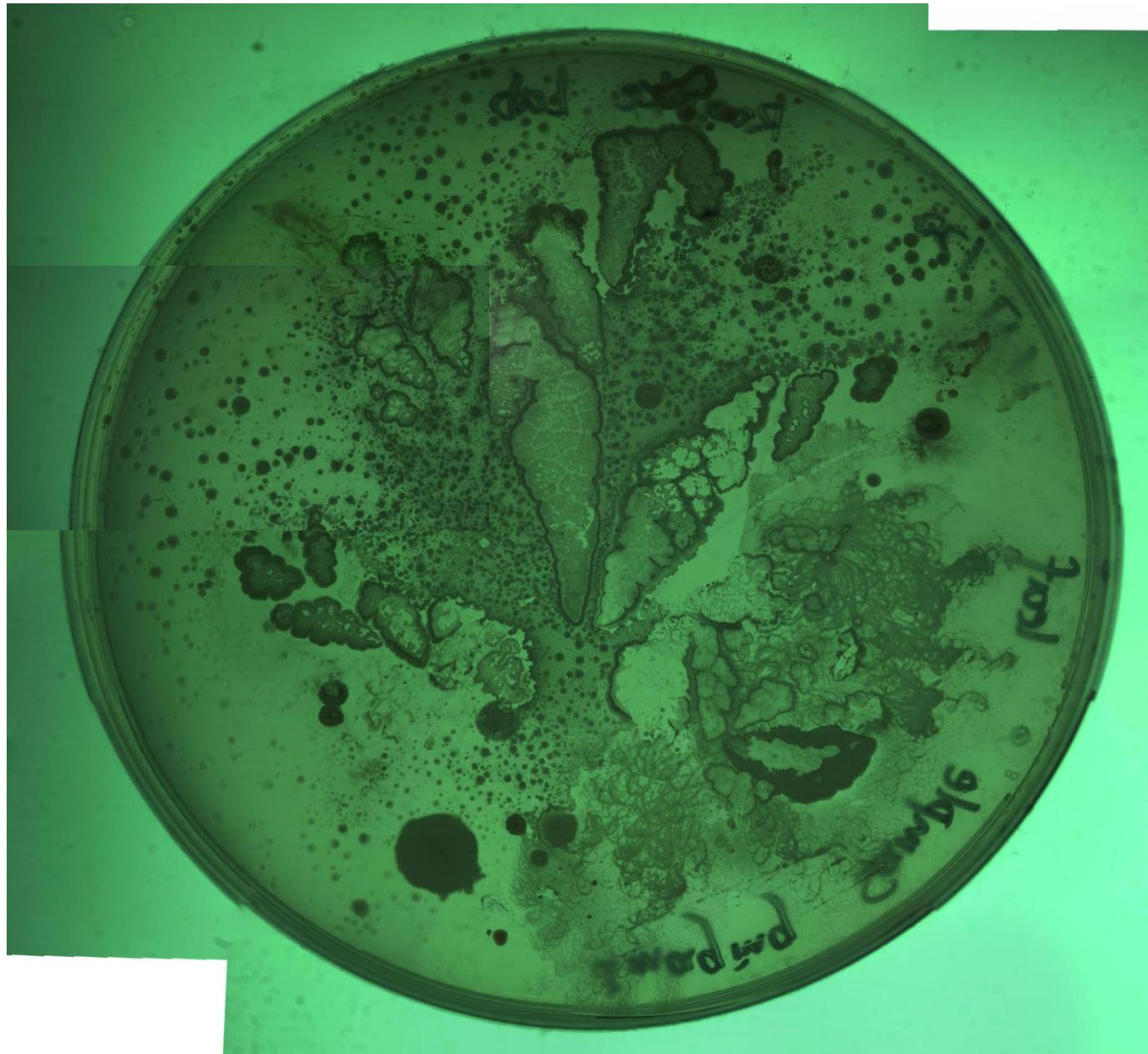


Figure 16. MCAM images of microbiome on one leaf growing on small nutrient plate.

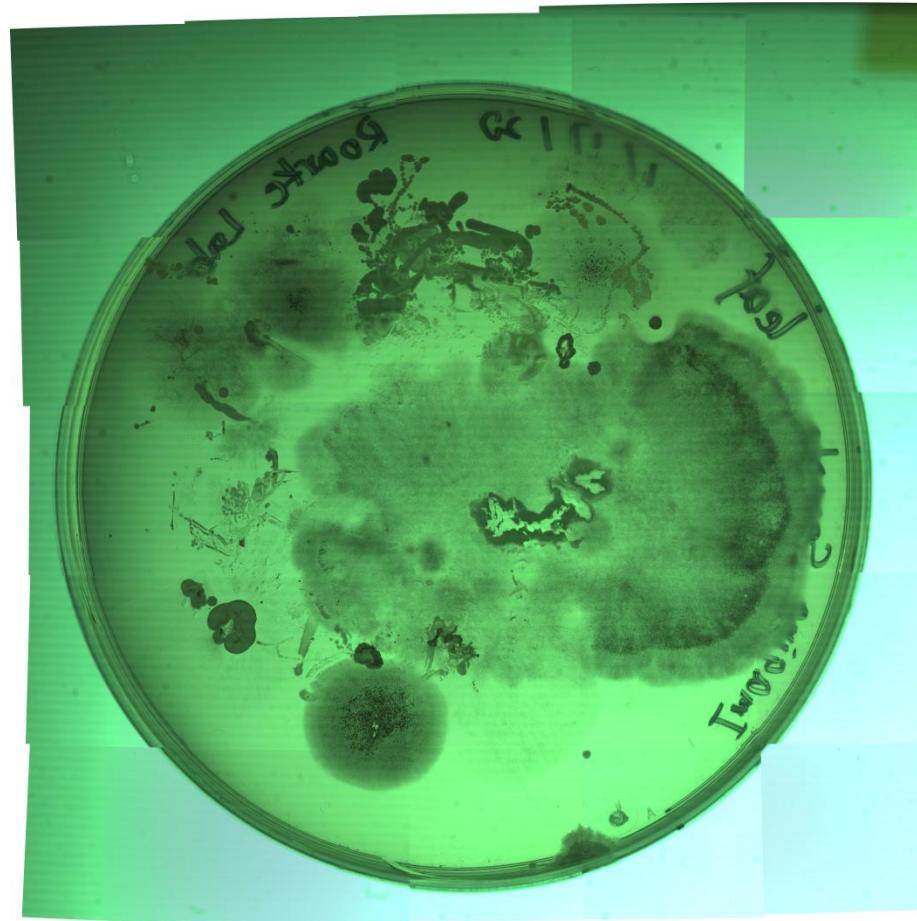


Figure 17. MCAM images of microbiome on one pine leaf growing on small nutrient plate.

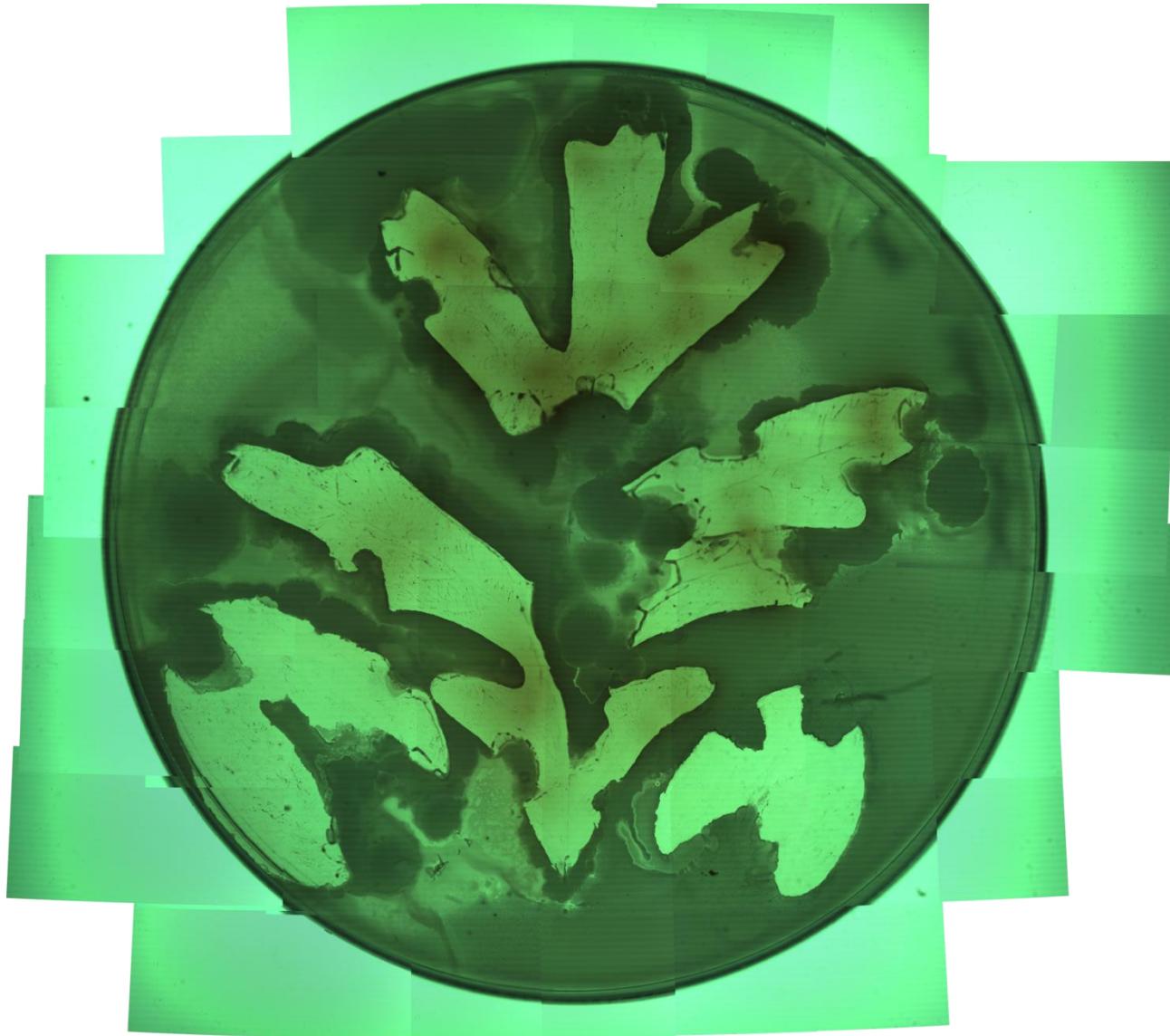


Figure 18. MCAM images of microbiome on one leaf growing on large nutrient plate.



Figure 19. MCAM images of flower shaped biofilm growing on small MacConkey plate. The red 'flowers' are *E.coli* and green 'leaves' are *P.fluorescens*.



Figure 20. MCAM images of bacterial portrait for Roarke Horstmeyer, utilizing both *E.coli* and *P.fluorescens* bacteria.