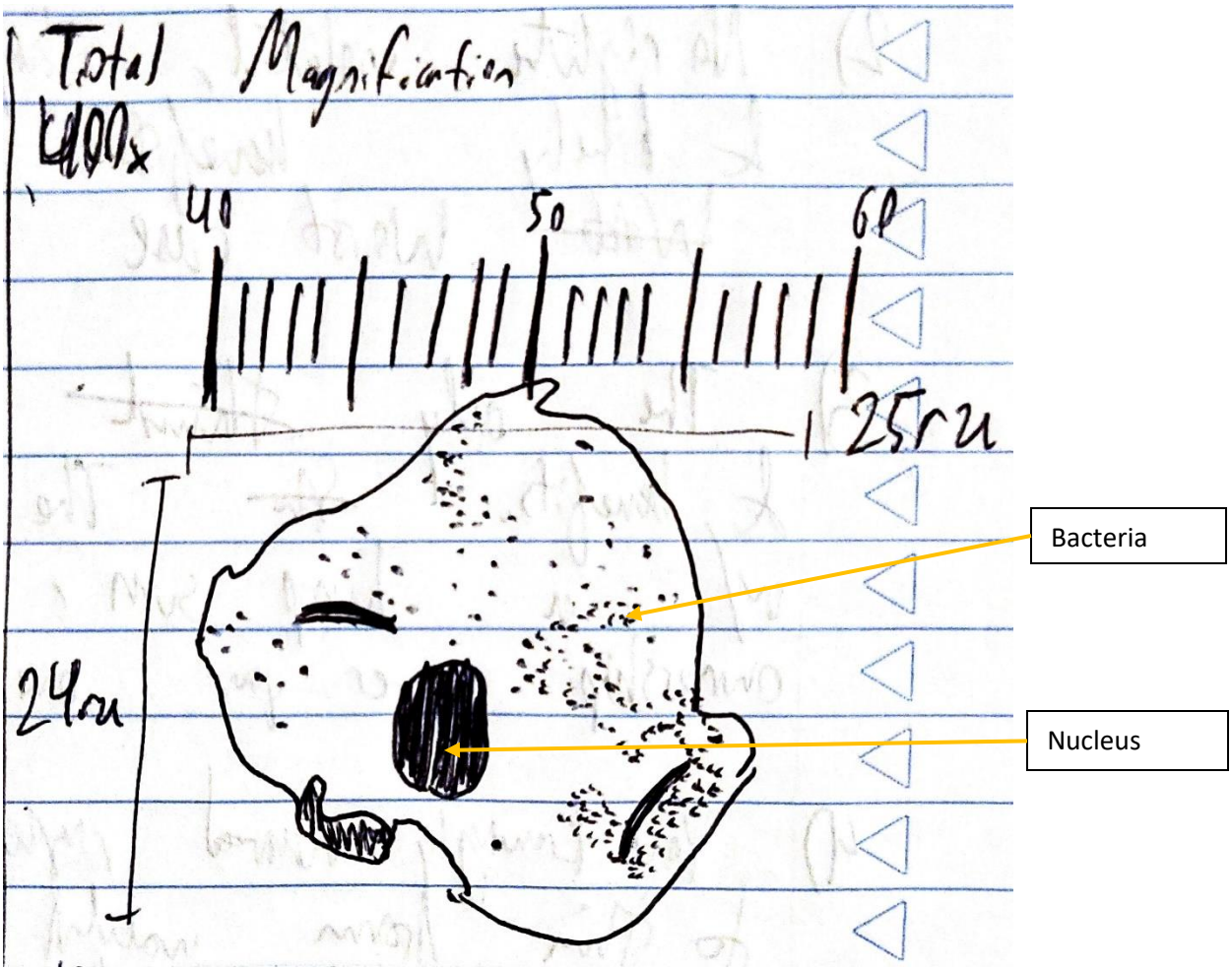
Table 1: Fluorophores and stains, their excitation and emission wavelengths, information about corresponding structure stained, and pointers to images

Fluorophore / Stain	**Excitation Wavelength (nm)**	**Emission Wavelength (nm)**	**Structure Stained**	**Function of Structure Stained**	**Pointer to Image**
Methylene blue	NA*	NA*	DNA	Stores genetic information	Image 1, Nucleus
DAPI	358	461	DNA	Stores genetic information	Image 2, Nucleus; Image 3, Nucleus
Alexa 555 phalloidin	555**	565**	F-actin	Form microfilaments, part of the cytoskeleton, which maintains cell shape and structure	Image 3, Actin
Texas Red-X phalloidin	591	608	F-actin	Form microfilaments, part of the cytoskeleton, which maintains cell shape and structure	Image 2, Actin
BODIPY FL goat anti-mouse IgG	505	513	Microtubules	Another part of the cytoskeleton, which maintains cell shape and structure	Image 2, Microtubules

* Methylene blue is different from the other chemicals listed. Firstly, it is a stain, but not a fluorophore; rather, it appears as blue under white light. Secondly, while it primarily stains DNA, it also stains other cell components, meaning that the entire cell had a blue hue, although the DNA was more darkly stained than the other components.

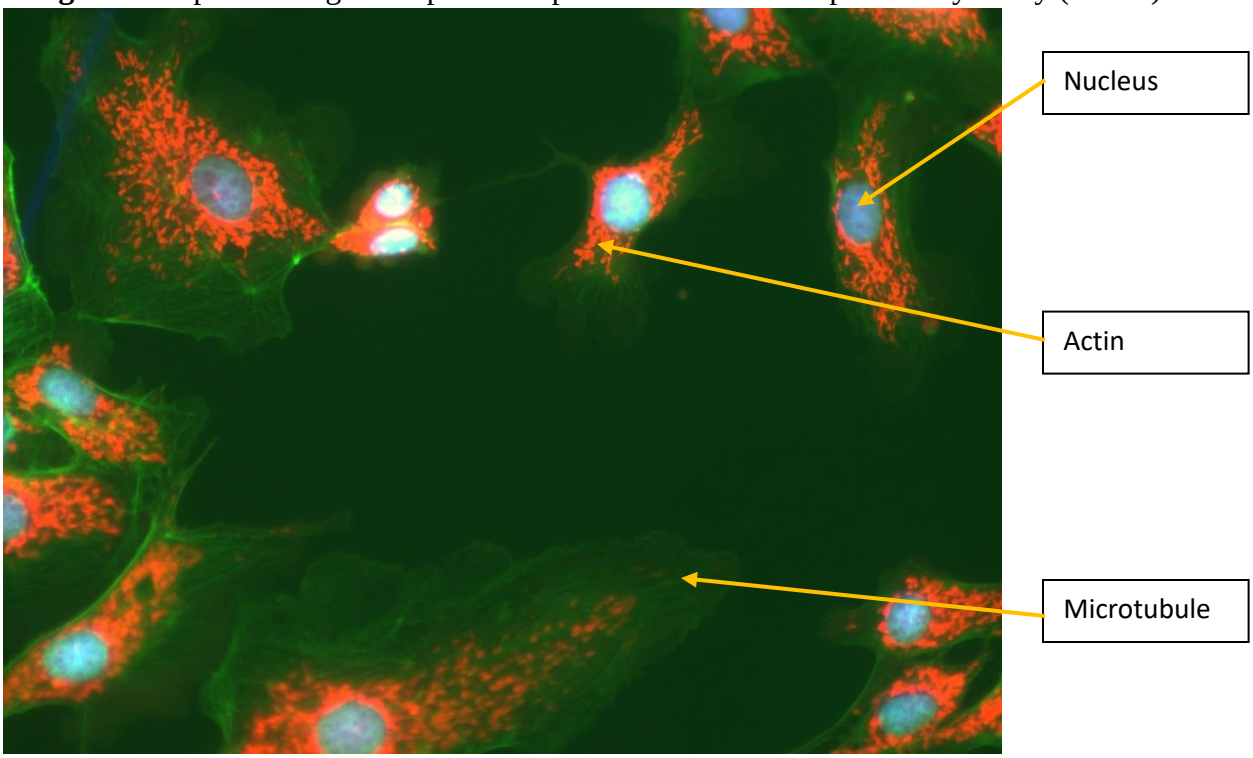
** https://www.thermofisher.com/order/catalog/product/A34055

Image 1: Sketch of human cheek cell stained with methylene blue, with cell dimensions and magnification included



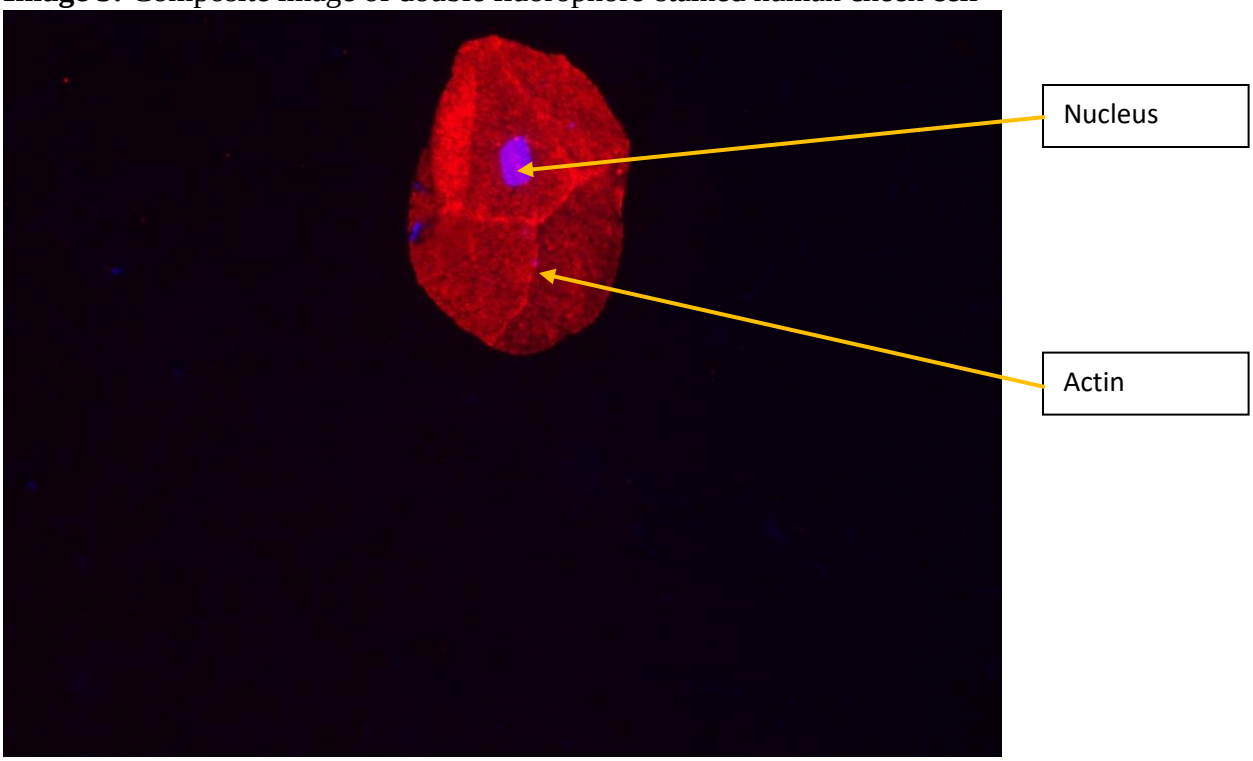
A sketch of a human cheek cell stained with methylene blue. In the image, the whole cell was stained blue, but the areas colored in black were stained a darker blue. The nucleus is clearly visible, and is labeled. The other dark spots—the many small dots and the three larger dark areas—were bacteria whose DNA was also stained. Note that the cell was bounded by a box of width 25 reticle units and height 24 reticle units. At this magnification, 1 reticule unit is 2.5 micrometers, so that the bounding box has width 62.5 micrometers and height 60 micrometers. Also note that we were told a sketch would be acceptable for this image, as the focus was on obtaining fluorescence microscopy images.

Image 2: Composite image of triple fluorophore-stained bovine pulmonary artery (BPAE) cells



Composite image of nuclei, actin, and microtubule in BPAE cells taken with a fluorescence microscope. The nuclei were stained with DAPI, which was excited by UV light and emitted blue light. The actin was stained with Texas Red-X phalloidin, which was excited by green light and emitted red light. The microtubules were stained with BODIPY FL goat anti-mouse IgG, which was excited by blue light and emitted green light. Note that although the background is green, this does not indicate the presence of microtubules outside of the cell; rather, this is an artefact of the camera. Despite setting the microscope to dark field and trying several settings of the exposure time and gain, this artefact could not be eliminated.

Image 3: Composite image of double fluorophore-stained human cheek cell



Composite image of nucleus and actin in a human cheek cell (specifically that of Arturo Rocha). The nucleus was stained with DAPI, which was excited by UV light and emitted blue light. The actin was stained with Alexa 555 phalloidin, which was excited by green light and emitted red light.