Estimation of Camera Response. The sensitivities of red, green and blue light detection
elements of the camera (Canon EOS Digital Rebel XT) used in SPR imaging were
estimated using a prism. A collimated beam from a tungsten halogen light source was
passed through a slit and the resulting sheet of light directed incident to one face of a
BK7 equilateral prism (Edmund Optics, Barrington, NJ). The white light was dispersed to
create a spectrum of constituent wavelengths, which was subsequently imaged by the
camera. Neutral density filters (Newport) were employed to avoid saturation of the
sensor. The positions of select wavelengths in the spectrum were identified with a set of
bandpass interference filters to yield a calibration of red, green and blue pixel values with
the wavelength of light being imaged. The linear response of the camera was also
confirmed using a selection of neutral density filters.

Figure A.1 depicts the response of the three detection elements as a function of
wavelength of light, with the minimum and maximum values for red (R), green (G) and
blue (B) pixels of 0 and 255, repsectively. In this image, the pixel value is a measure of
light intensity while pixel location refers to the spatial location. The sensitivity of the
camera clearly spans across the visible spectrum (400-700 nm) with the sensitivity curves
for red, green, and blue pixels peaking at 620, 548 and 472 nm, respectively. This
measured sensitivity of the camera has been used in this work to emulate the response of
the camera and it also provides an effective way of converting information from wavelength space to the RGB color space.

**Figure A.1.** Sensitivity calibration curves for the red, green and blue light detection elements of the digital camera.