38.15. **Solve:** The laser light delivers 2.5×10^{17} photons per second and 100×10^{-3} J of energy per second. Thus, the energy of each photon is

$$\frac{100 \times 10^{-3} \text{ J/s}}{2.5 \times 10^{17} \text{ s}^{-1}} = 4.0 \times 10^{-19} \text{ J}$$

From Equation 38.4, the wavelength of the photons is

$$\lambda = \frac{hc}{E} = \frac{\left(6.63 \times 10^{-34} \text{ J s}\right)\left(3.0 \times 10^{8} \text{ m/s}\right)}{4.0 \times 10^{-19} \text{ J}} = 4.97 \times 10^{-7} \text{ m} = 497 \text{ nm}$$

Assess: The wavelength is in the visible region.