

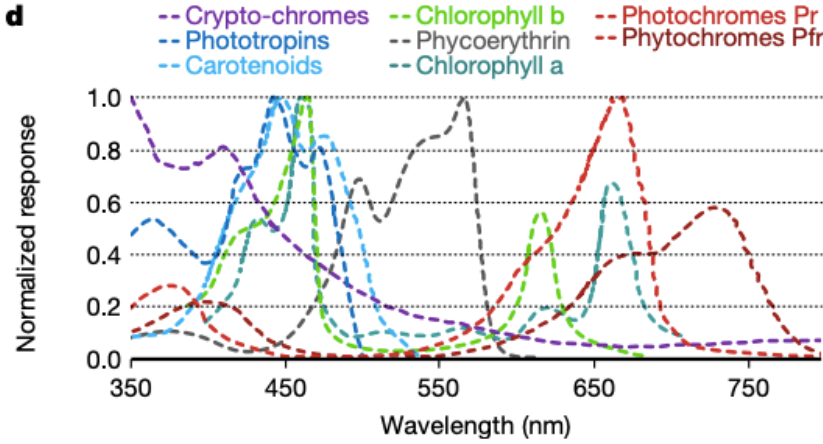
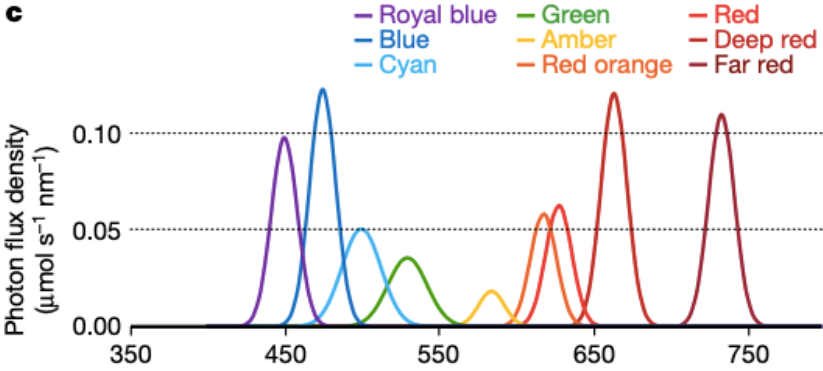
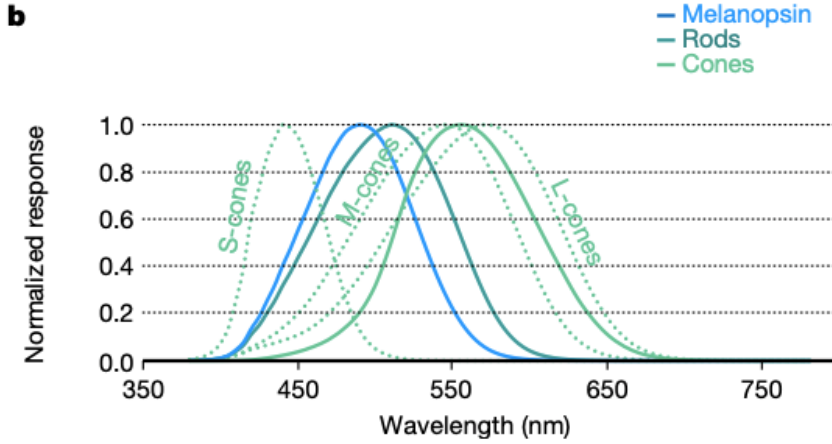
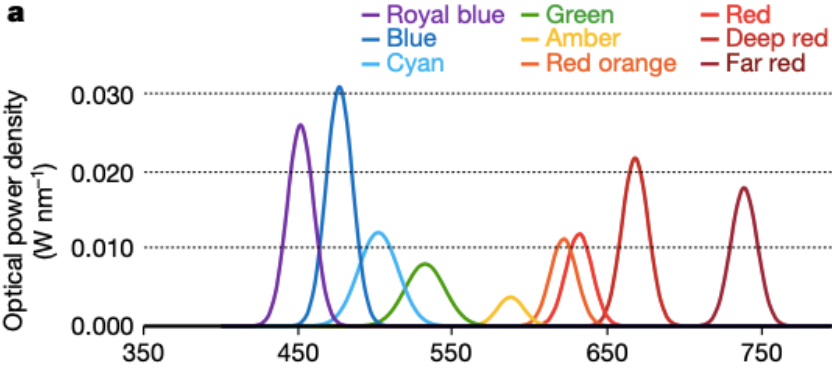
# LEDs for Photons, Physiology, and Food

DOE Lighting R&D Workshop  
January 29, 2020  
San Diego

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# Action Spectrum



# Animal Responses to light



# A few more observations

- LEDs have very high power conversion efficiency. Not likely to be surpassed
- No obvious down-side with LED technology
  - Saves energy, relatively benign materials, improved lighting performance, new lighting capabilities and value, including improved health and new opportunities for food production
- “For every use of lighting, the technological possibilities of LED lighting currently outstrip our understanding of how best to use the light for the application.’ - Need collaborative efforts to advance lighting science
- NASA

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# Thank You!

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