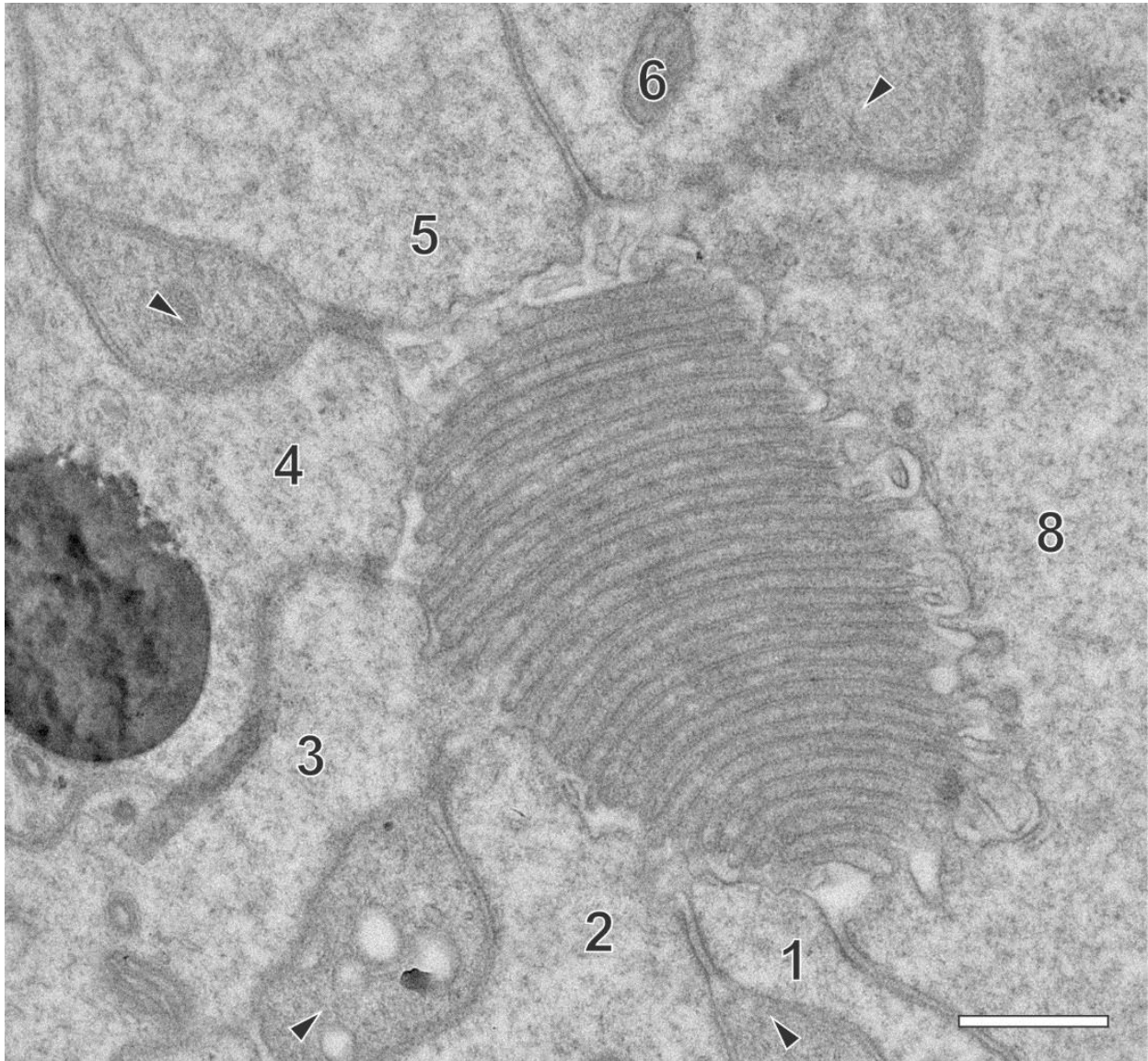
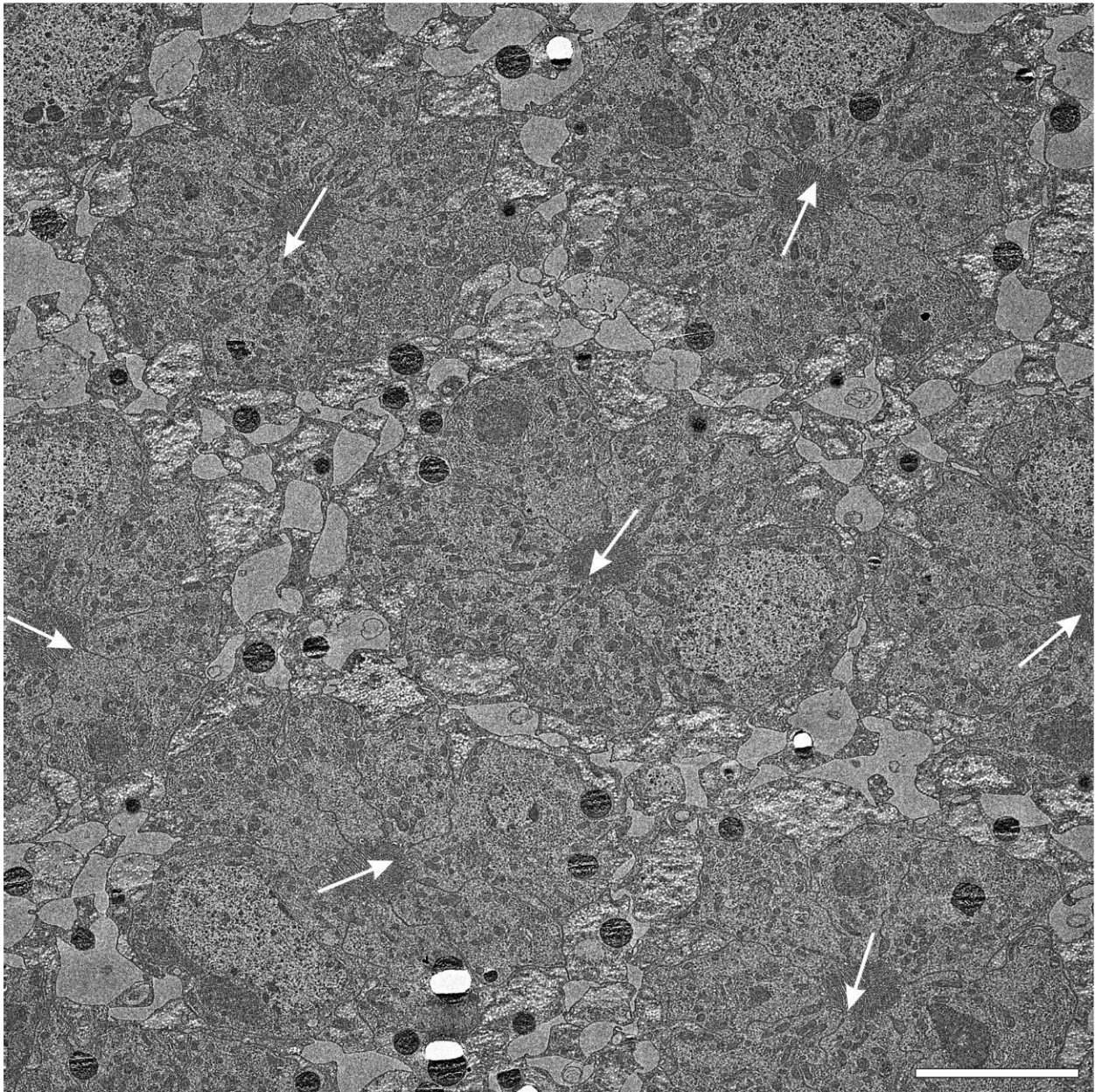


## Supplementary information



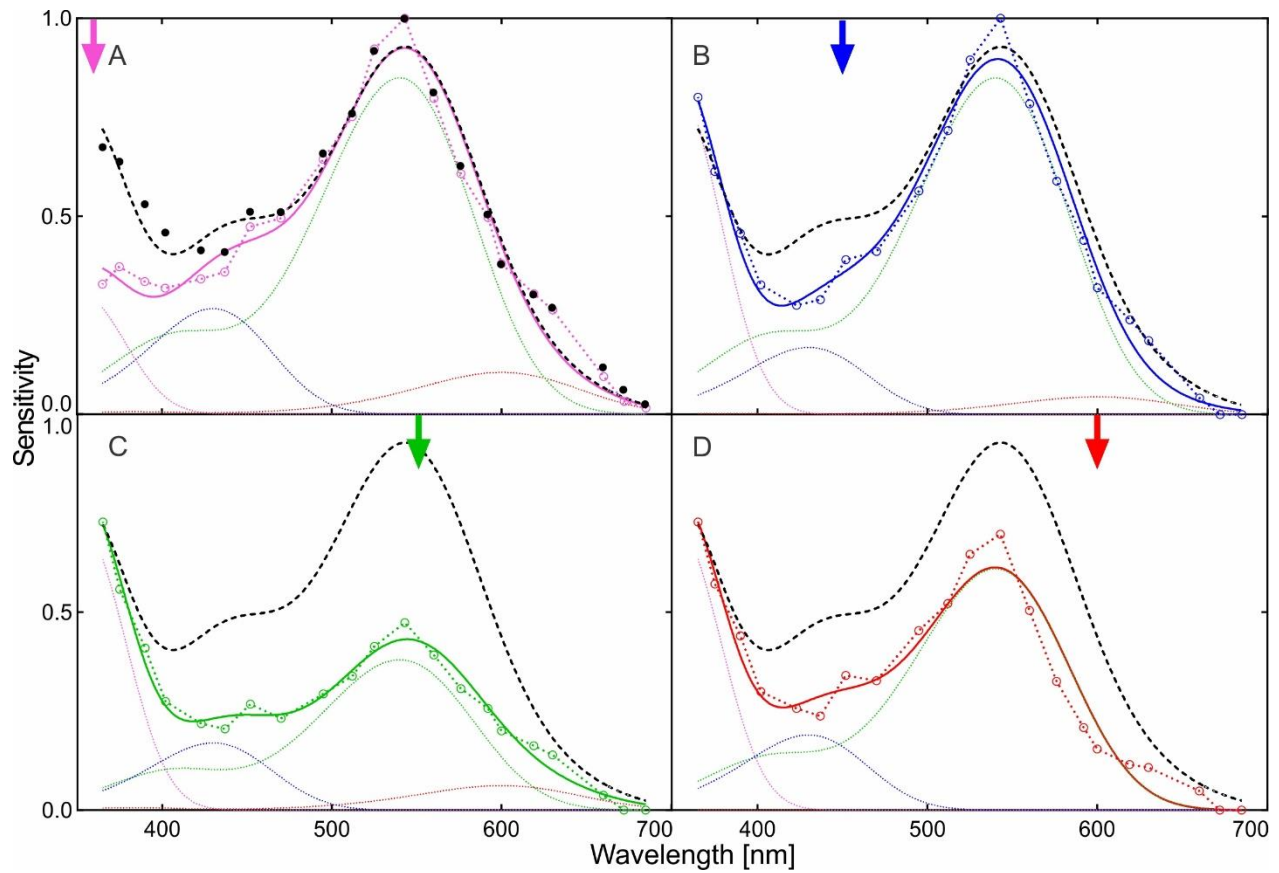
**Fig. S1 Proximal rhabdom.**

Electron micrograph of the ommatidium on the left in Fig. 4A. Most microvilli are contributed by R8, some by R3 and R2. Numbers indicate photoreceptor cell identity, arrowheads indicate crystalline cone extensions. Scale bar, 500 nm.



**Fig. S2 Cross section of the central distal retina.**

7 ommatidia with randomly oriented rhabdoms. Arrows indicate the direction R2 – R5/6. Scale bar 5  $\mu$ m.



**Fig. S3 Spectral sensitivity of a compound eye, determined with electroretinography (ERG).** Dashed black curve, linear sum of rhodopsin templates (small dotted curves,  $\lambda_{\max}$ =350, 430, 540, 600 nm) fitted to the sensitivity of dark-adapted eye (full black circles in A). Solid curves, linear sums of templates, fitted to sensitivities of eyes (empty colored circles and dotted lines), adapted to UV (A, 360 nm), blue (B, 440 nm), green (C 540 nm) and red (D, 600 nm) light (all adapting lights,  $\sim 10^{11}$  quanta  $\text{cm}^{-2} \text{s}^{-1}$ ).