

References

- 3D4SCIFollow. (2023, January 1). *Complete eye anatomy*. Sketchfab. <https://skfb.ly/oOSEw>
- Alberts, B., Heald, R., Johnson, A., Morgan, D., Raff, M. C., Roberts, K., & Walter, P. (2022). *Molecular biology of the cell*. W. W. Norton & Company.
- Ambati, J., & Fowler, B. J. (2012). Mechanisms of age-related macular degeneration. *Neuron*, 75(1), 26–39. <https://doi.org/10.1016/j.neuron.2012.06.018>
- Anatomy of the eye*. Johns Hopkins Medicine. (n.d.).
<https://www.hopkinsmedicine.org/health/conditions-and-diseases/anatomy-of-the-eye>
- Antonetti, D. A., Klein, R., & Gardner, T. W. (2012). Diabetic retinopathy. *New England Journal of Medicine*, 366(13), 1227–1239. <https://doi.org/10.1056/nejmra1005073>
- Arshavsky, V. Y., Lamb, T. D., & Pugh, E. N. (2002). G proteins and phototransduction. *Annual Review of Physiology*, 64(1), 153–187.
<https://doi.org/10.1146/annurev.physiol.64.082701.102229>
- Augustine, G. J., Groh, J. M., Huettel, S. A., LaMantia, A.-S., & White, L. E. (2024). *Neuroscience*. Oxford University Press.
- Baker, C. I., Peli, E., Knouf, N., & Kanwisher, N. G. (2005). Reorganization of visual processing in Macular Degeneration. *The Journal of Neuroscience*, 25(3), 614–618.
<https://doi.org/10.1523/jneurosci.3476-04.2005>
- Bhutto, I., & Lutty, G. (2012). Understanding age-related macular degeneration (AMD): Relationships between the photoreceptor/retinal pigment epithelium/Bruch's membrane/choriocapillaris complex. *Molecular Aspects of Medicine*, 33(4), 295–317.
<https://doi.org/10.1016/j.mam.2012.04.005>

- Burns, M. E., & Baylor, D. A. (2001). Activation, deactivation, and adaptation in vertebrate photoreceptor cells. *Annual Review of Neuroscience*, 24(1), 779–805.
<https://doi.org/10.1146/annurev.neuro.24.1.779>
- Burrus, N. (n.d.). *Online color blindness simulator*. DaltonLens.
<https://daltonlens.org/colorblindness-simulator>
- Cheung, N., Mitchell, P., & Wong, T. Y. (2010). Diabetic retinopathy. *The Lancet*, 376(9735), 124–136. [https://doi.org/10.1016/s0140-6736\(09\)62124-3](https://doi.org/10.1016/s0140-6736(09)62124-3)
- Chondrozoumakis, G., Chatzimichail, E., Habra, O., Vounotrypidis, E., Papanas, N., Gatzoufas, Z., & Panos, G. D. (2025). Retinal biomarkers in diabetic retinopathy: From early detection to personalized treatment. *Journal of Clinical Medicine*, 14(4), 1343.
<https://doi.org/10.3390/jcm14041343>
- Dacey, D., Kim, Y. J., Packer, O., Macrina, T., Pollreisz, A., Curcio, C., Lee, K., Kemnitz, N., Ih, D., Nguyen, T., Lu, R., Popovych, S., Halageri, A., Bae, J., Strout, J., Gerhard, S., Smith, R., Martin, P., & Grunert, U. (2025). *Connectome of a Human Foveal Retina*.
<https://doi.org/10.21203/rs.3.rs-7312705/v1>
- A detailed look at the eye*. Canadian Association of Optometrists. (2025).
<https://opto.ca/eye-health-library/detailed-look-eye>
- Du, Y., & Shen, Y. (2025). Progress in photoreceptor replacement therapy for retinal degenerative diseases. *Cell Insight*, 4(1), 100223.
<https://doi.org/10.1016/j.cellin.2024.100223>
- Euler, T., & Wässle, H. (1995). Immunocytochemical identification of cone bipolar cells in the rat retina. *Journal of Comparative Neurology*, 361(3), 461–478.
<https://doi.org/10.1002/cne.903610310>

- Fain, G. L., Matthews, H. R., Cornwall, M. C., & Koutalos, Y. (2001). Adaptation in vertebrate photoreceptors. *Physiological Reviews*, *81*(1), 117–151.
<https://doi.org/10.1152/physrev.2001.81.1.117>
- Garhöfer, G., Chua, J., Tan, B., Wong, D., Schmidl, D., & Schmetterer, L. (2020). Retinal neurovascular coupling in diabetes. *Journal of Clinical Medicine*, *9*(9), 2829.
<https://doi.org/10.3390/jcm9092829>
- Ghaseminejad, F., Tam, B. M., Chiu, C. N., Feehan, J. M., & Moritz, O. L. (2022). Gene editing treatment strategies for retinitis pigmentosa assessed in xenopus laevis carrying a mutant rhodopsin allele. *Journal of Translational Genetics and Genomics*, *6*, 111–125.
<https://doi.org/10.20517/jtgg.2021.49>
- Hartong, D. T., Berson, E. L., & Dryja, T. P. (2006). Retinitis pigmentosa. *The Lancet*, *368*(9549), 1795–1809. [https://doi.org/10.1016/s0140-6736\(06\)69740-7](https://doi.org/10.1016/s0140-6736(06)69740-7)
- Heidelberg, R., Thoreson, W. B., & Witkovsky, P. (2005). Synaptic transmission at retinal ribbon synapses. *Progress in Retinal and Eye Research*, *24*(6), 682–720.
<https://doi.org/10.1016/j.preteyeres.2005.04.002>
- Johnson, T. V., Baranov, P., Di Polo, A., Fortune, B., Gokoffski, K. K., Goldberg, J. L., Guido, W., Kolodkin, A. L., Mason, C. A., Ou, Y., Reh, T. A., Ross, A. G., Samuels, B. C., & Zack, D. J. (2023). The retinal ganglion cell repopulation, stem cell transplantation, and optic nerve regeneration consortium. *Ophthalmology Science*, *3*(4), 100390.
<https://doi.org/10.1016/j.xops.2023.100390>
- Jones, B. W., & Marc, R. E. (2005). Retinal remodeling during retinal degeneration. *Experimental Eye Research*, *81*(2), 123–137. <https://doi.org/10.1016/j.exer.2005.03.006>

- Kandel, E. R., Koester, J. D., Mack, S. H., & Siegelbaum, S. A. (2021). *Principles of Neural Science*. McGraw Hill.
- Kawamura, S., & Tachibanaki, S. (2008). Rod and cone photoreceptors: Molecular basis of the difference in their physiology. *Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology*, *150*(4), 369–377.
<https://doi.org/10.1016/j.cbpa.2008.04.600>
- Kolb, H. (2003). *How the retina works* | *American scientist*. American Scientist.
<https://www.americanscientist.org/article/how-the-retina-works>
- Lamb, T. D., & Pugh, E. N. (2004). Dark adaptation and the retinoid cycle of Vision. *Progress in Retinal and Eye Research*, *23*(3), 307–380.
<https://doi.org/10.1016/j.preteyeres.2004.03.001>
- Levin, L. A., Kaufman, P. L., & Hartnett, M. E. (2025). *Adler's physiology of the eye*. Elsevier.
- Liao, D. S., Grossi, F. V., El Mehdi, D., Gerber, M. R., Brown, D. M., Heier, J. S., Wykoff, C. C., Singerman, L. J., Abraham, P., Grassmann, F., Nuernberg, P., Weber, B. H. F., Deschatelets, P., Kim, R. Y., Chung, C. Y., Ribeiro, R. M., Hamdani, M., Rosenfeld, P. J., Boyer, D. S., ... Francois, C. G. (2020). Complement C3 inhibitor Pegcetacoplan for geographic atrophy secondary to age-related macular degeneration. *Ophthalmology*, *127*(2), 186–195. <https://doi.org/10.1016/j.ophtha.2019.07.011>
- Lim, L. S., Mitchell, P., Seddon, J. M., Holz, F. G., & Wong, T. Y. (2012). Age-related macular degeneration. *The Lancet*, *379*(9827), 1728–1738.
[https://doi.org/10.1016/s0140-6736\(12\)60282-7](https://doi.org/10.1016/s0140-6736(12)60282-7)

- London, A., Benhar, I., & Schwartz, M. (2012a). The Retina as a window to the brain—from eye research to CNS disorders. *Nature Reviews Neurology*, *9*(1), 44–53.
<https://doi.org/10.1038/nrneurol.2012.227>
- London, A., Benhar, I., & Schwartz, M. (2012b). The Retina as a window to the brain—from eye research to CNS disorders. *Nature Reviews Neurology*, *9*(1), 44–53.
<https://doi.org/10.1038/nrneurol.2012.227>
- Ludwig, P. E., Jessu, R., & Czyz, C. N. (2023, July 17). Physiology, eye.
<https://www.ncbi.nlm.nih.gov/books/NBK470322/>
- Machiele, R., Lopez, M. J., & Czyz, C. N. (2023, July 24). Anatomy, head and neck: Eye Lacrimal gland. <https://www.ncbi.nlm.nih.gov/books/NBK532914/>
- Masu, M., Iwakabe, H., Tagawa, Y., Miyoshi, T., Yamashita, M., Fukuda, Y., Sasaki, H., Hiroi, K., Nakamura, Y., Shigemoto, R., Takada, M., Nakamura, K., Nakao, K., Katsuki, M., & Nakanishi, S. (1995). Specific deficit of the on response in visual transmission by targeted disruption of the MGIUR6 gene. *Cell*, *80*(5), 757–765.
[https://doi.org/10.1016/0092-8674\(95\)90354-2](https://doi.org/10.1016/0092-8674(95)90354-2)
- Matsubara, J. A., Tian, Y., Cui, J. Z., Zeglinski, M. R., Hiroyasu, S., Turner, C. T., & Granville, D. J. (2020). Retinal distribution and extracellular activity of granzyme B: A serine protease that degrades retinal pigment epithelial tight junctions and extracellular matrix proteins. *Frontiers in Immunology*, *11*. <https://doi.org/10.3389/fimmu.2020.00574>
- Nathans, J. (1999). The evolution and physiology of Human Color Vision. *Neuron*, *24*(2), 299–312. [https://doi.org/10.1016/s0896-6273\(00\)80845-4](https://doi.org/10.1016/s0896-6273(00)80845-4)
- Neitz, J., & Neitz, M. (2011). The genetics of normal and Defective Color Vision. *Vision Research*, *51*(7), 633–651. <https://doi.org/10.1016/j.visres.2010.12.002>

- Nickla, D. L., & Wallman, J. (2010a). The multifunctional choroid. *Progress in Retinal and Eye Research*, 29(2), 144–168. <https://doi.org/10.1016/j.preteyeres.2009.12.002>
- Nickla, D. L., & Wallman, J. (2010b). The multifunctional choroid. *Progress in Retinal and Eye Research*, 29(2), 144–168. <https://doi.org/10.1016/j.preteyeres.2009.12.002>
- Obasanmi, G., Uppal, M., Cui, J. Z., Xi, J., Ju, M. J., Song, J., To, E., Li, S., Khan, W., Cheng, D., Zhu, J., Irani, L., Samad, I., Zhu, J., Yoo, H.-S., Aubert, A., Stoddard, J., Neuringer, M., Granville, D. J., & Matsubara, J. A. (2024). Granzyme B degrades extracellular matrix and promotes inflammation and choroidal neovascularization. *Angiogenesis*, 27(3), 351–373. <https://doi.org/10.1007/s10456-024-09909-9>
- Ong, J. X., Konopek, N., Fukuyama, H., & Fawzi, A. A. (2023). Deep capillary nonperfusion on OCT angiography predicts complications in eyes with referable nonproliferative diabetic retinopathy. *Ophthalmology Retina*, 7(1), 14–23. <https://doi.org/10.1016/j.oret.2022.06.018>
- Pugh, E. N., & Lamb, T. D. (2000). Chapter 5 phototransduction in vertebrate rods and cones: Molecular mechanisms of amplification, recovery and light adaptation. *Handbook of Biological Physics*, 183–255. [https://doi.org/10.1016/s1383-8121\(00\)80008-1](https://doi.org/10.1016/s1383-8121(00)80008-1)
- Rehman, I., Hazhirkarzar, B., & Patel, B. C. (2023, July 24). Anatomy, Head and Neck, Eye. <https://www.ncbi.nlm.nih.gov/books/NBK482428/>
- Sahel, J., Bonnel, S., Mrejen, S., & Paques, M. (2010). Retinitis pigmentosa and other dystrophies. *Developments in Ophthalmology*, 160–167. <https://doi.org/10.1159/000320079>
- Sahel, J.-A., Boulanger-Scemama, E., Pagot, C., Arleo, A., Galluppi, F., Martel, J. N., Esposti, S. D., Delaux, A., de Saint Aubert, J.-B., de Montleau, C., Gutman, E., Audo, I., Duebel, J.,

- Picaud, S., Dalkara, D., Blouin, L., Taniel, M., & Roska, B. (2021). Partial recovery of visual function in a blind patient after optogenetic therapy. *Nature Medicine*, 27(7), 1223–1229. <https://doi.org/10.1038/s41591-021-01351-4>
- Tam, B. M., & Moritz, O. L. (2009). The role of rhodopsin glycosylation in protein folding, trafficking, and light-sensitive retinal degeneration. *The Journal of Neuroscience*, 29(48), 15145–15154. <https://doi.org/10.1523/jneurosci.4259-09.2009>
- Tam, B. M., Qazalbash, A., Lee, H.-C., & Moritz, O. L. (2010). The dependence of retinal degeneration caused by the rhodopsin P23H mutation on light exposure and Vitamin A deprivation. *Investigative Ophthalmology & Visual Science*, 51(3), 1327. <https://doi.org/10.1167/iovs.09-4123>
- Tarallo, V., Hirano, Y., Gelfand, B. D., Dridi, S., Kerur, N., Kim, Y., Cho, W. G., Kaneko, H., Fowler, B. J., Bogdanovich, S., Albuquerque, R. J. C., Hauswirth, W. W., Chiodo, V. A., Kugel, J. F., Goodrich, J. A., Ponicsan, S. L., Chaudhuri, G., Murphy, M. P., Dunaief, J. L., ... Ambati, J. (2012). Dicer1 loss and alu RNA induce age-related macular degeneration via the NLRP3 inflammasome and myd88. *Cell*, 149(4), 847–859. <https://doi.org/10.1016/j.cell.2012.03.036>
- Thoreson, W. B., & Mangel, S. C. (2012). Lateral interactions in the outer retina. *Progress in Retinal and Eye Research*, 31(5), 407–441. <https://doi.org/10.1016/j.preteyeres.2012.04.003>
- Turbert, D. (2023, May 2). *Eye anatomy: Parts of the eye and how we see*. American Academy of Ophthalmology. <https://www.aao.org/eye-health/anatomy/parts-of-eye>
- U.S. Department of Health and Human Services. (2022). *How the eyes work*. National Eye Institute. <https://www.nei.nih.gov/eye-health-information/healthy-vision/how-eyes-work>

- Wang, N.-L. (2016). Neurodegeneration in diabetic retinopathy. *Chinese Medical Journal*, *129*(24), 3001–3003. <https://doi.org/10.4103/0366-6999.195478>
- Wareham, L. K., Liddelow, S. A., Temple, S., Benowitz, L. I., Di Polo, A., Wellington, C., Goldberg, J. L., He, Z., Duan, X., Bu, G., Davis, A. A., Shekhar, K., Torre, A. L., Chan, D. C., Canto-Soler, M. V., Flanagan, J. G., Subramanian, P., Rossi, S., Brunner, T., ... Calkins, D. J. (2022). Solving neurodegeneration: Common mechanisms and strategies for new treatments. *Molecular Neurodegeneration*, *17*(1). <https://doi.org/10.1186/s13024-022-00524-0>
- Weinreb, R. N., Aung, T., & Medeiros, F. A. (2014). The pathophysiology and treatment of glaucoma. *JAMA*, *311*(18), 1901. <https://doi.org/10.1001/jama.2014.3192>
- Wilson, A. M., & Di Polo, A. (2011). Gene therapy for retinal ganglion cell neuroprotection in glaucoma. *Gene Therapy*, *19*(2), 127–136. <https://doi.org/10.1038/gt.2011.142>
- Yang, Y., & Sun, X. (2022). Retinal ganglion cell death in glaucoma: Advances and caveats. *Current Eye Research*, *48*(1), 1–10. <https://doi.org/10.1080/02713683.2022.2068182>
- Yau, K.-W., & Hardie, R. C. (2009). Phototransduction motifs and variations. *Cell*, *139*(2), 246–264. <https://doi.org/10.1016/j.cell.2009.09.029>
- Yoo, H.-S., Chakravarthy, H., Xi, J., Cui, J., Ai, Z., Hosseini, A., Song, J., Tan, N., Ma, N., Zhou, C., Li, B., Bell, R., Haegert, A., Le Bihan, S., Ju, M. J., Granville, D. J., & Matsubara, J. A. (2025). Granzyme B contributes to subretinal fibrosis in neovascular age-related macular degeneration by modulating inflammation and epithelial-mesenchymal transition. *Journal of Neuroinflammation*, *23*(1). <https://doi.org/10.1186/s12974-025-03619-9>

Yoo, H.-S., Shanmugalingam, U., & Smith, P. D. (2021). Harnessing astrocytes and Müller glial cells in the retina for survival and regeneration of retinal ganglion cells. *Cells*, *10*(6), 1339. <https://doi.org/10.3390/cells10061339>