Preventing blindness

Loss of photoreceptors in the retina results in visual impairment and eventually blindness. Light can damage the retina through processes that involve G protein–coupled receptors (GPCRs). Chen et al. took a systems pharmacology approach to identify combinations of drugs that activate or inhibit specific GPCRs to prevent light-induced retinal damage in a mouse model of progressive retinal degeneration. This approach identified a photoreceptor-protecting combination of FDA-approved drugs that activated the $G_{i/o}$-coupled dopamine receptors D2R and D4R, inhibited the $G_s$-coupled dopamine receptor D1R, and inhibited the $G_q$-coupled $\alpha_{1A}$-adrenergic receptor. This study not only provides a potential therapeutic strategy for preventing blindness due to retinal degeneration but also suggests that systems pharmacology approaches could lead to the discovery of new combinations of available drugs to promote therapeutic changes in signaling networks.