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Resumo	Background and objective: Optogenetics has opened new insights into biomedical research with the ability to manipulate and control cellular activity using light in combination with genetically engineered photosensitive proteins. By stimulating with light, this method provides high spatiotemporal and high specificity resolution, which is in contrast to conventional pharmacological or electrical stimulation. Optogenetics was initially introduced to control neural activities but was gradually extended to other biomedical fields. Study design: In this paper, firstly, we summarize the current optogenetic tools stimulated by different light sources, including lasers, light-emitting diodes, and laser diodes. Second, we outline the variety of biomedical applications of optogenetics not only for neuronal circuits but also for various kinds of cells and tissues from cardiomyocytes to ganglion cells. Furthermore, we highlight the potential of this technique for treating neurological disorders, cardiac arrhythmia, visual impairment, hearing loss, and urinary bladder diseases as well as clarify the mechanisms underlying cancer progression and control of stem cell differentiation. Conclusion: We sought to summarize the various types of promising applications of optogenetics to treat a broad spectrum of disorders. It is

	conceivable to expect that optogenetics profits a growing number of patients suffering from a range of different diseases in the near future.
Fomento	