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Diabetic retinopathy: a comprehensive update on in vivo, in vitro and ex vivo experimental models
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Abstract
Diabetic retinopathy (DR), one of the leading causes of visual impairment and blindness worldwide, is one of the major microvascular complications in diabetes mellitus (DM). Globally, DR prevalence among DM patients is 25%, and 6% have vision-threatening problems among them. With the higher incidence of DM globally, more DR cases are expected to be seen in the future. In order to comprehend the pathophysiological mechanism of DR in humans and discover potential novel substances for the treatment of DR, investigations are typically conducted using various experimental models. Among the experimental models, in vivo models have contributed significantly to understanding DR pathogenesis. There are several types of in vivo models for DR research, which include chemical-induced, surgical-induced, diet-induced, and genetic models. Similarly, for the in vitro models, there are several cell types that are utilised in DR research, such as retinal endothelial cells, Müller cells, and glial cells. With the advancement of DR research, it is essential to have a comprehensive update on the various experimental models utilised to mimic DR environment. This review provides the update on the in vitro, in vivo, and ex vivo models used in DR research, focusing on their features, advantages, and limitations. © 2023, BioMed Central Ltd., part of Springer Nature.

Author Keywords
Diabetic retinopathy; Ex vivo; Experimental models; In vitro; In vivo

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blindness, diabetes mellitus, diabetic retinopathy, endothelium cell, human, low vision, pathology, prevalence, retina; Blindness, Diabetes Mellitus, Diabetic Retinopathy, Endothelial Cells, Humans, Prevalence, Retina, Vision, Low

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