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PII: S0928-4680(16)30082-7
DOI: http://dx.doi.org/doi:10.1016/j.pathophys.2017.07.001
Reference: PATPHY 910

To appear in: *Pathophysiology*

Received date: 8-11-2016
Revised date: 26-6-2017
Accepted date: 4-7-2017

Please cite this article as: Randa S.Eshaq, Alaa M.Z.Aldalati, J.Steven Alexander, Norman R.Harris, Diabetic Retinopathy: Breaking the Barrier, Pathophysiologyhttp://dx.doi.org/10.1016/j.pathophys.2017.07.001

Diabetic Retinopathy: Breaking the Barrier

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ABSTRACT

Diabetic retinopathy (DR) remains a major complication of diabetes and a leading cause of blindness among adults worldwide. DR is a progressive disease affecting both type I and type II diabetic patients at any stage of the disease, and targets the retinal microvasculature. DR results from multiple biochemical, molecular and pathophysiological changes to the retinal vasculature, which affect both microcirculatory functions and ultimately photoreceptor function. Several neural, endothelial, and support cell (e.g., pericyte) mechanisms are altered in a pathological fashion in the hyperglycemic environment during diabetes that can disturb important cell surface components in the vasculature producing the features of progressive DR pathophysiology. These include loss of the glycocalyx, blood-retinal barrier dysfunction, increased expression of inflammatory cell markers and adhesion of blood leukocytes and platelets. Included in this review is a discussion of modifications that occur at or near the surface of the retinal vascular endothelial cells, and the consequences of these alterations on the integrity of the retina.

Keywords: Retina; Permeability; Oxidative stress; Diabetes; Blood-retinal barrier