

IN THE BODY

DIABETES

**HYPERGLYCEMIA**  
(high blood sugars)

*triggers*

IN THE CELLS

**BIOCHEMICAL CHANGES**

(polyol pathways, hexosamine pathways, PKC pathways, AGE and inflammation)

**OSMOTIC CHANGES**

(swelling/shrinking of cells)

**OXIDATIVE STRESS**

(cell damage/cell death)

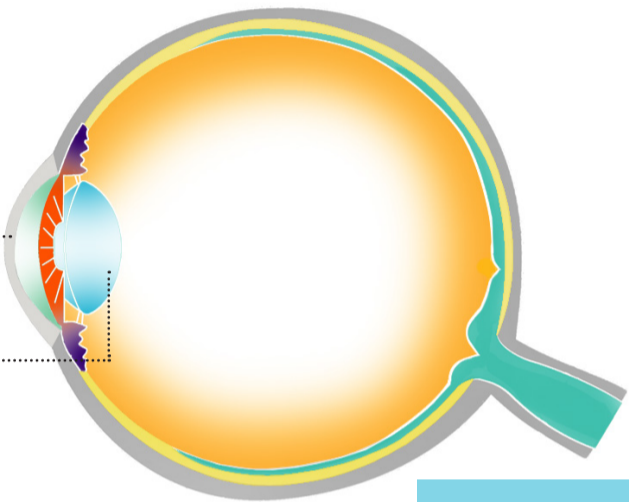
**INFLAMMATION**

(response in cells)

Structural and functional changes in various parts of the eye

**OSMOTIC / INFLAMMATORY CHANGES**

Corneal epithelial damage  
Changes in refraction  
Cataracts



**MICROVASCULAR CHANGES**

**LEAKAGE**

Microaneurysms  
Hard exudates  
Haemorrhages inter-retinal

**Macula oedema (central involvement)**

**OCCLUSION**

Hypoxia (loss of oxygen to retina)

Cotton wool spots

Growth factors (VEGF)

**Neovascularisation**

**VISION LOSS**

**MICROANEURYSM** - small deep red dots in the retina (not haemorrhages) but as "out-pouches" from damaged or weakened capillary walls. They may or may not be leaking.

**HARD EXUDATE** - distinct yellow white deposits of lipids that have leaked from damaged retinal capillaries. They can be seen as small deposits, larger plaques or in distinct circinate pattern around the macular.

**HAEMORRHAGES** - intraretinal bleeding may be 'dot', 'blot' or 'flame' shaped depending on their depth within the retina.

**COTTON WOOL SPOTS** - greyish white fluffy patches of discolouration in the nerve fiber layer, linked with focal hypoxia and swelling of nerve fibers.

**MACULAR OEDEMA** - swelling at the macular caused by leakage and build of fluid into the retina, affecting vision.

**VEGF** - Vascular Endothelial Growth Factor. Stimulates the growth of new blood vessels.

**NEOVASCULARISATION** - abnormal and fragile new blood vessel growth on the retinal surface, which can bleed easily, affecting vision.