

Resveratrol has been shown in studies to have beneficial effects on eye health in a number of common age-related eye diseases and disorders. The key actions of resveratrol are due to its anti-oxidant, anti-apoptotic, anti-inflammatory, antiangiogenic and vaso-relaxant properties.<sup>1</sup>

**There are 4 main disorders or ocular diseases:**

1. Age-related macular degeneration (AMD), the leading cause of vision loss in adults over 50<sup>2</sup>
2. Diabetic retinopathy (DR) with an estimated 140m sufferers globally<sup>3</sup>
3. Primary open-angle glaucoma (POAG), a chronic disease thought to affect more than 60m people worldwide<sup>4</sup>
4. Age-related cataracts is responsible for 51% of global blindness<sup>5</sup>

**Age-related macular degeneration (AMD) and resveratrol:**

- Impaired blood flow and subsequent ischemic changes leads to blurred or no vision in the center of the visual field.<sup>6</sup>
- Resveratrol-based supplementation was shown to positively effect anatomical restoration of retinal structure, improved blood flow and suppress pathological changes induced by hypoxia.<sup>7</sup>
- Resveratrol affects mitochondrial biogenesis and has been shown to protect retinal pigment epithelium cells against oxidative cytotoxicity and, therefore, resveratrol may be useful as a nutraceutical in controlling the pathological processes in AMD.<sup>8,9</sup>

**Diabetic retinopathy (DR) and resveratrol:**

- DR results from chronic hyperglycaemia induced inflammation and is linked to gradual retinal pigment epithelium cell degeneration.<sup>10</sup>
- Affected pathological changes such as increased vessel leakage, pericyte loss and VEGF protein levels were blocked by treatment with resveratrol.<sup>11</sup>
- Resveratrol has been reported to protect retinal cells from apoptotic death and data suggest the potential use of resveratrol as a therapeutic agent to prevent retinal degeneration related to DR and light damage.<sup>12</sup>

**Primary open-angle glaucoma (POAG) and resveratrol:**

- Oxidative stress is thought to cause the damage and development of POAG. Resveratrol treatment effectively prevented increased production of intracellular reactive oxygen species and effected inflammatory markers (IL1 $\alpha$ , IL6, IL8, and ELAM-1), all biomarkers of oxidative stress.<sup>13</sup>

- Resveratrol could potentially have a role in preventing trabecular meshwork tissue abnormalities observed in POAG.

### Cataracts and resveratrol:

- The formation of age-related cataract is associated with prolonged oxidative stress. Treatment with resveratrol caused an increase in the levels of reduced glutathione which serves to protect against damage by oxidants.<sup>14</sup>
- Preclinical studies support the involvement of resveratrol for the prevention and treatment of eye diseases induced by oxidative stress and inflammation, such as age-related cataract.<sup>15</sup>

### References

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