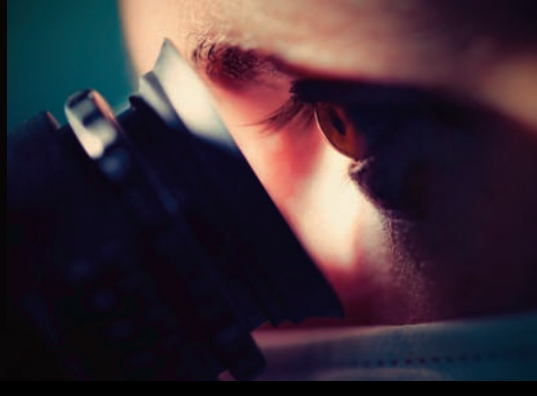


Technical Bulletin:
OXYGEN INDUCED RETINOPATHY

Overview

CBI has demonstrated expertise in all phases of the drug development process in preclinical contract ocular studies. Our highly specialized staff is experienced in providing exploratory/proof-of-concept, GLP toxicology, pharmacokinetics, in vivo animal models, pharmacology, and histopathology/immunohistochemistry related to the eye.

The most popular model to study abnormal angiogenesis in the retina is the oxygen-induced retinopathy (OIR) model in mice. One-week-old mouse pups are exposed to hyperoxia, which obliterates capillaries in the retina. Upon return to room air, the retina becomes hypoxic and triggers a vascular repair response, which then results in the formation of neurovascular tufts towards the vitreous, a hallmark of ischaemic retinopathies in human pathologies.

All laboratory animals are cared for and treated humanely in all CBI studies. These research animals are used to provide us with new science and new treatments for human and veterinary diseases.

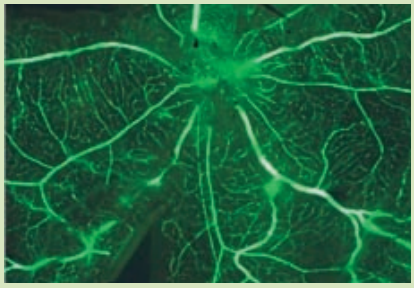
Oxygen-induced retinopathy in the mouse.

- Purpose
- Methods
- Results
- Conclusions

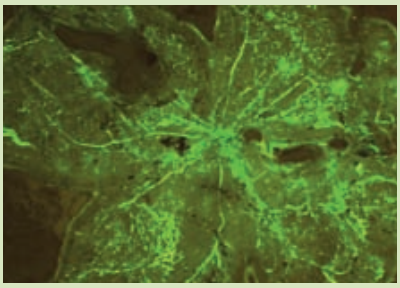
Oxygen-induced Retinopathy

Due to CBI's unique and extensive experience in preclinical contract ocular studies and state-of-the-art facilities, we have the skill and expertise to accelerate new ocular drugs from discovery through the drug development process to regulatory submission. CBI is committed and dedicated to providing ophthalmology research and offers a complete range of services to pharmaceutical, biotech, and medical device companies.

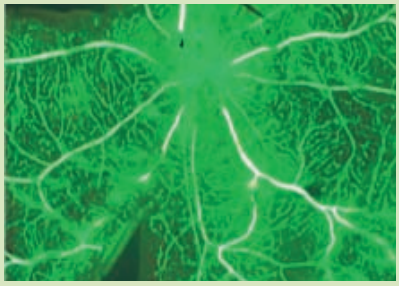
OIR model retinal flat mounts



Normal Rat
Flat Mount



Flat mount from rat pup following 2 weeks in ROP chamber demonstrating vascular proliferation and leakage.



Flat mount from rat pup following 2 weeks in ROP chamber demonstrating vascular proliferation and leakage followed by a single IVT injection of triamcinolone showing a reduction in the amount of leakage.

Oxygen-induced Retinopathy Study

Ischaemic vascular disease in the retina may either leave retina permanently ischaemic with slow degradation of vision, or alternatively lead to proliferative vascular disease, which can also destroy vision. To investigate the molecular and cellular mechanisms that contribute to this pathology a mouse model has been studied extensively. The model is based on the exposure of mouse pups to hyperoxia during a phase when their retinal vasculature is still developing. This leads to capillary depletion, and upon return to room air, results in retinal ischaemia and proliferative vascular disease in the retinal vasculature (oxygen-induced retinopathy (OIR)).

The most popular model to study abnormal angiogenesis in the retina is the oxygen-induced retinopathy (OIR) model in mice. One-week-old mouse pups are exposed to hyperoxia, which obliterates capillaries in the retina. Upon return to room air, the retina becomes hypoxic and triggers a vascular repair response, which then results in the formation of neurovascular tufts towards the vitreous, a hallmark of ischaemic retinopathies in human pathologies. Although the pathogenesis of vascular damage in different human ischaemic retinopathies varies considerably, the final neurovascular stage is very similar in all of these retinopathies. The tuft formation is often referred to as 'pathological angiogenesis' and has made the OIR model a key tool in addressing vascular pathology in ischaemic retinopathies.

There are other hyperoxia–hypoxia mouse models (eg, based on cyclic oxygen levels), and other species have also been examined.