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APPLICATION NOTES

TECHNICAL NOTE: DEVELOPMENT OF A RABBIT CORNEAL INJURY REPAIR MODEL

Introduction:

Rabbits have been widely used in the study of corneal injuries as they share structural similarities with the human eye¹. Additionally, the rabbit cornea is large and easily accessible to surgical methods and dose topical therapies. A rabbit model to study cornea injury repair is highly translational as the injury response mimics humans and have been reported to develop more severe inflammation¹.

In this technical note, Biomere and JOINN Laboratories report the characterization of a New Zealand White rabbit model of corneal injury and repair.

Experimental Design:

The study used two male New Zealand White rabbits. On Day 0, a 6 mm corneal wound was created in the right eye by mechanical scratching of the corneal epithelium using both a golf club spud and an Algerbrush deburring tool. Recombinant Human Epidermal Growth Factor (hEGF) eye drops were applied to the wound 4 times a day (QID). The eyes were stained with fluorescein Glo strips and observed under a blue light to monitor the wound repair.

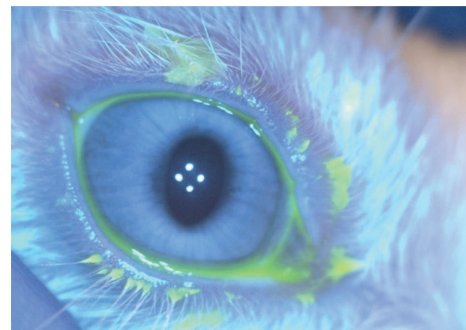
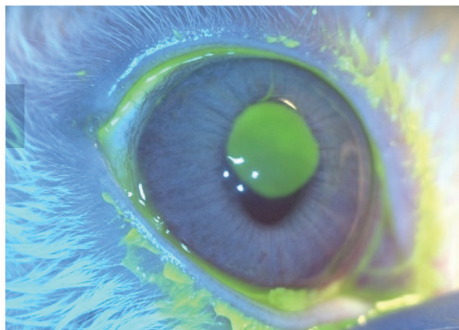
Results:

A successful 6mm sized wound was created on the cornea surface of the right eye for both study animals and the application of recombinant hEGF eye drops proved to be a successful positive control and healed the corneal wound completely by Day 4.

Summary:

The study reported complete repair of a corneal wound by the application of hEGF and this model can be used to study recurring corneal erosion and injury and can be used to characterize topically applied ocular therapies, such as eye drops, targeted to the cornea.

Figure 1: The left panel shows a 6 mm corneal wound detected using fluorescein Glo strips; the central panel shows the wound size is decreased in response to the topical application of hEGF eye drops QID; the right panel shows a completely healed wound with no detected fluorescence on the cornea.



Reference:

1. <https://link.springer.com/article/10.1007/s40123-023-00880-0>