TACONIC

LPTA ANIMAL MODELS

LPTA Animal Model *Vegfr2-luc Xen*

Information

Mouse Strain:	FVB/N-Tg(Vegfr2-luc)-Xen
Common Name:	*Vegfr2-luc*
Genotype:	Hemizygous
Background Strain:	FVB/N
Coat Color:	Albino

Key Applications

- Inflammation
- Angiogenic processes
    - Embryonic development, Post-natal development
    - Wound healing, Cancer

Description of Model:

A light producing animal model (LPTA®) animal model FVB/N-Tg(Vegfr2-luc)-Xen, commonly called Vegfr2-luc, carries a transgene containing a 4.5 kb murine VEGFR2 promoter and a modified firefly luciferase cDNA (Promega pGL-3). Basal expression or the reporter was observed in lung, testes, and uterus. The reporter is inducible during cutaneous wound healing and delayed type hypersensitivity reaction. The model provides for the rapid study of transcriptional regulation of the VEGFR2 gene and for rapid screening of anti-angiogenesis and anti-inflammatory reagents.

Origin

The background strain is FVB/N. This transgenic line was created by microinjection method using FVB/N donor fertilized eggs.

Applications

The Vegfr2-luc LPTA® animal model is useful in studying a variety of angiogenic processes, including embryonic development, post-natal development, wound healing, and delayed type hypersensitivity.

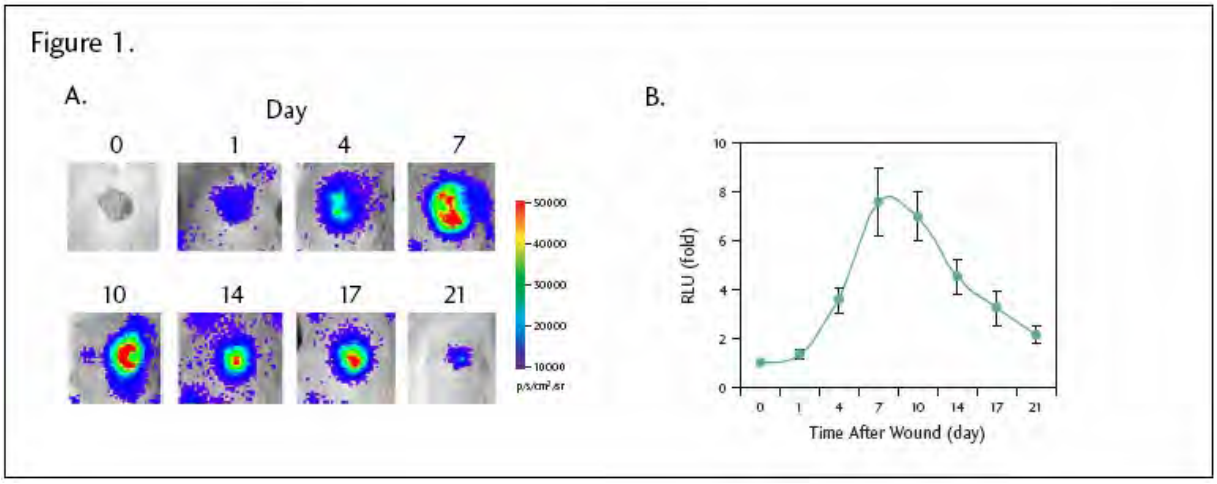

Figure 1. A punch wound of 8 mm in diameter was made on the back of female Vegfr2-luc mice. Mice were imaged at selected time points (A). Photons/sec quantified from wound area (B). The data represent a 7.6-fold induction at Day 7 relative to Day 0.

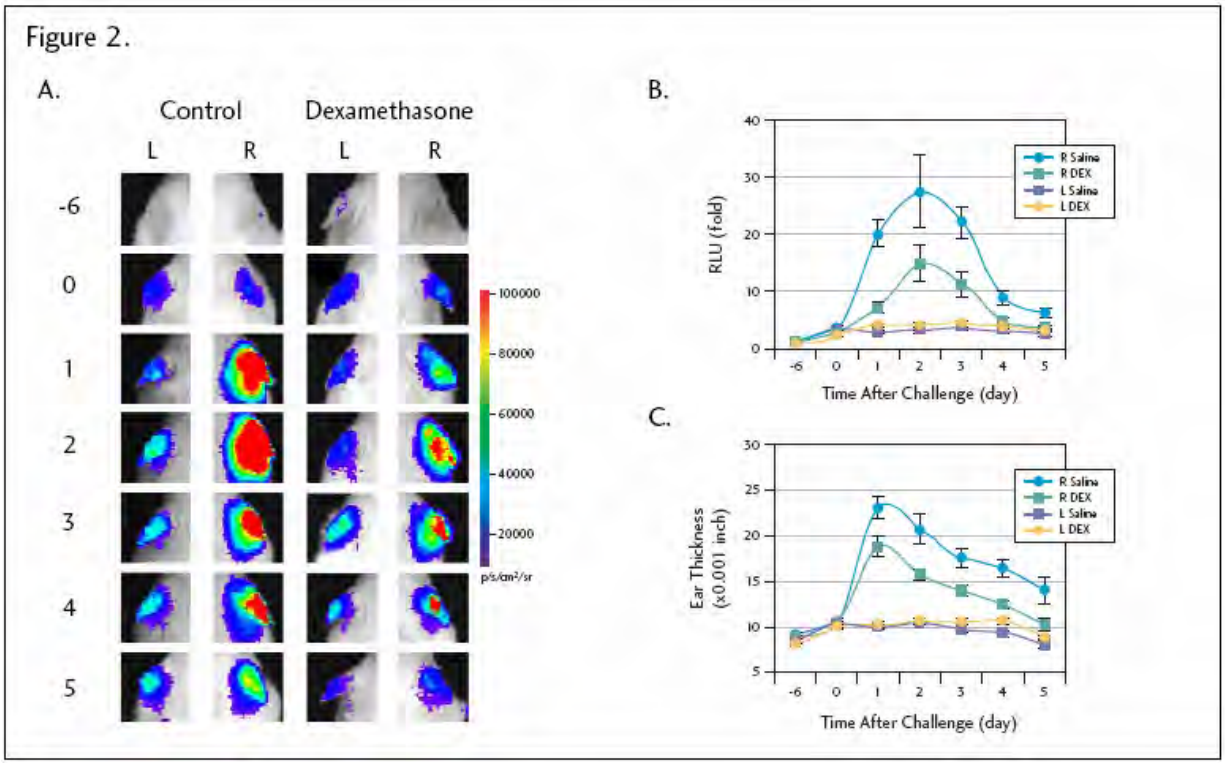

Figure 2. Mice were sensitized by topical application of 50 µl of 2% oxazolone to the shaved abdominal region. Six days post-sensitization, the right ear was topically challenged with 10 µl of 1% oxazolone. Mice were imaged at the selected time points (A). Photons/sec were quantified from the ear (B). Ear thickness was measured (C).

Example Phenotype

The coat color of the LPTA® animal model is albino. Vegfr2-luc mice have been observed to have litters of 8–12 pups. At 6 weeks of age, adult mice weights were appropriate: 25–35g.

Wound healing

Vegfr2-luc transgene was induced during wound healing. The signal was detectable one day after wound creation and peaked at Day 7 (Figure 1A, page 1). Quantification analysis of the luciferase signal showed a 7.6-fold induction at Day 7 relative to Day 0 (Figure 1B).

Delayed-Type Hypersensitivity

Vegfr2-luc female mice were sensitized with oxazolone. Six days after sensitization, the Vegfr2-luc transgene was induced to express luciferase following topical application of Oxazolone to the right ear. The left ear was treated topically with vehicle (acetone/olive oil, 4:1 vol/vol) and served as a control. Peak induction occurred 2 days after challenging. Luciferase expression in the right ear was significantly inhibited by dexamethasone. Treatment triggered a 28-fold and 15-fold increased luciferase expression in the right ear for control and dexamethasone-treated mice, respectively. Luciferase induction was accompanied by an induction in ear thickness.

Genotype

The transgenic lines are hemizygous. The presence of the Vegfr2-luc transgene was determined by PCR. The 1 kb PCR product from the sequence internal to the luciferase gene was amplified using forward primer:

(5'- TGGATTCTAAAACGGATTACCAGGG -3')
and reverse primer:
(5'- CCAAAACAACAACGGCGGC -3'),

both at 0.4 µM in the reaction mix. PCR conditions: 97ºC 5:00 min; 94.5ºC 0:40 min; 58ºC 1:30 min; 72ºC 1:30 for 35 Cycles; 72ºC 10:00; hold at 4ºC until analysis.

References

References

1. Zhang N, Fang ZX, Li B, Purchio AF, West DB. Tracking Angiogenesis Induced by Skin Wounding and Contact Hypersensitivity Using a Vegfr2-luciferase Transgenic Mouse. Blood. 2004;103:617-626.
2. Ronicke V, Risau W, Breier G. Characterization of the Endothelium-Specific Murine Vascular Endothelial Growth Factor Receptor-2 (Flk-1) Promoter. Circ Res. 1996; 79: 277-285.

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