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### Title

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### VASCULAR EFFECTS OF BEVACIZUMAB AND PULSED DYE LASER PROTOCOLS

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**Background and Objectives:** Post-treatment recurrence of blood vessels may limit efficacy of pulsed dye laser (PDL) vascular therapy. We hypothesized that administration of an antiangiogenic agent (Bevacizumab, Genentech) prior to laser therapy would prolong vascular shutdown achieved with PDL.

**Study Design/Materials and Methods:** Rodents with surgically-installed dorsal window chambers were randomly assigned to groups: (1) Control, window surgery only; (2) Bevacizumab alone; (3) PDL 11 J/cm<sup>2</sup>; (4) Bevacizumab + PDL 11 J/cm<sup>2</sup>; (5) PDL 8 J/cm<sup>2</sup>, two pulses spaced by two minutes; (6) Bevacizumab + PDL 8 J/cm<sup>2</sup>, two pulses spaced by two minutes. Bevacizumab was administered intravenously via tail vein injection 24 hours before laser. Laser speckle imaging was used to monitor blood-flow dynamics and assess vessel damage for one week post-intervention.

**Results:** Data were analyzed using repeated measures ANOVA. Statistically significant differences ( $p < 0.05$ ) were observed for: Control versus Bevacizumab + PDL 11 J/cm<sup>2</sup> ( $p = 0.016$ ), Bevacizumab alone versus Bevacizumab + PDL 11 J/cm<sup>2</sup> ( $p = 0.005$ ) and PDL 11 J/cm<sup>2</sup> versus Bevacizumab + PDL 11 J/cm<sup>2</sup> ( $p = 0.048$ ).

**Conclusions:** Recurrence of flow frequently occurs following PDL intervention. Administration of bevacizumab may prevent recurrence of flow in vessels treated with pulsed dye laser. Benefit was most clearly demonstrated with higher radiant exposures. Bevacizumab did not help maintain a substantial decrease in perfusion if the laser treatment itself achieved inadequate perfusion reduction. Further work on the potential combination of laser therapy with antiangiogenic agents for treatment of vascular lesions is warranted.