

## Cells to Surgery Quiz: December 2015

Vidhi V. Shah<sup>1</sup>, Stephanie Mlacker<sup>1</sup>, Adam S. Aldahan<sup>1</sup>, Mohammed Alsaidan<sup>1</sup>, Sahal Samarkandy<sup>1</sup> and Keyvan Nouri<sup>1</sup>

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Questions relate to the image as well as to selected articles in *JID*, which are listed after the questions. Answers will be posted as supplementary material. We hope you enjoy this challenge.



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**1. A 5-month-old girl presents with a compound hemangioma with ulceration on the upper arm. Her mother is concerned that it is increasing in size and becoming painful. Pulsed dye laser (PDL) is chosen to treat the hemangioma. The effect of the PDL on infantile hemangiomas (IHs) may be associated with which of the following:**

- a. Upregulation of the rate of apoptosis in human umbilical vein endothelial cells (HUVECs) *in vitro*.
- b. Downregulation of serum levels of vascular endothelial growth factor (VEGF) after PDL treatment in children with IHs.
- c. Downregulation of VEGF messenger RNA expression in HUVECs.
- d. Ultrastructural cellular changes such as chromatin condensation.
- e. All of the above.

<sup>1</sup>Department of Dermatology, University of Miami Miller School of Medicine, Miami, Florida, USA

Correspondence: Keyvan Nouri, Sylvester Comprehensive Cancer Center, UHealth–University of Miami Health System, 1475 NW 12th Avenue, Suite 2175, Miami, Florida 33136, USA. E-mail: knouri@med.miami.edu

2. Zhang *et al.* studied two types of macrophages in the pathogenesis of hemangiomas: M1-polarized macrophages, which respond to T helper type 1 immune cells and secrete proinflammatory cytokines, and M2-polarized macrophages, which are induced by IL-3 and IL-4 (these are involved in wound healing and cancer formation by secreting proangiogenic and anti-inflammatory factors). According to their study, which of the following statements is false?

- a. M1- and M2-polarized macrophages can promote the proliferation of hemangioma stem cells (HemSCs).
- b. More M1-polarized than M2-polarized macrophages were found in proliferating and involuting hemangiomas.
- c. Only M2-polarized macrophages can promote the endothelial differentiation of HemSCs.
- d. Cell media from M1- and M2-polarized macrophages remarkably enhanced cell surface expression of CD31 in HemSCs.
- e. Cell media from either M1- or M2-polarized macrophages significantly suppressed the adipogenesis of HemSCs.

3. Zhang *et al.* demonstrated that macrophages enhance the proliferation and vasculogenesis of hemangioma stem cells while suppressing fatty tissue formation. After the addition of macrophage-containing medium, which of the following was found to be involved in the vasculogenesis and adipogenesis of IH in this study?

- a. Akt and Erk1/2.
- b.  $\beta$ -Adrenergic binding ligand receptor.
- c. Notch intracellular domain.
- d. PDGF/PDGFR-B.

### TOPIC ARTICLE

Questions 2 and 3 refer to the following article:

Zhang W, Chen G, Wang F-Q *et al.* (2015) Macrophages contribute to the progression of infantile hemangioma by regulating the proliferation and differentiation of hemangioma stem cells. *J Invest Dermatol* 135:3163–72

Answers are available as supplementary material at <http://dx.doi.org/10.1038/jid.2015.395>.