

## Robert A. Redden

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### Education

**Ph.D. student**, Biomedical engineering  
Drexel University, Philadelphia, PA

2006 to present

**Research:** Influence of TrkA, TrkB expression and activation in neuroblastoma

- Experimental measurement and mathematical modeling of the kinetics of cell aggregation and cell behavior (proliferation) in the microgravity rotary bioreactor
- Morphology and morphometry of aggregates (organoids) formed in bioreactor culture
- In vitro model of metastasis (collagen invasion)

**Master of Science**, Biomedical engineering  
University of Alabama at Birmingham, Birmingham, AL

2000

**Thesis:** Quantitative clinical biomechanical assessment of the pliability of skin graft scars.

**Other Research Projects:**

- Quantification of acute healing of skin grafts and pressure ulcers by photographic image analysis and laser Doppler flowmetry.
- Investigation and development of fibrin as tissue adhesive, degradable scaffold, and drug delivery system

**Bachelor of Science**, Biomedical engineering  
Duke University, Durham, NC

1990

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### Relevant Professional Experience

**Senior Research Associate**

Children's Hospital of Philadelphia, Philadelphia, PA

January 2002 to present

In vitro models of wound healing (e.g., cell-populated collagen gels)

Quantitative assessment of cancer cell behavior in microgravity rotary bioreactor culture

Tissue engineering of skin, bronchial epithelium, and cartilage

**Lead Research Associate**

Department of Neurology, Emory University, Atlanta, GA

1994 to 1996

Quantitatively assessed motor function and movement of Alzheimer's and Parkinson's patients

**Research Associate**

Department of Cardiology, Emory University, Atlanta, GA

1991 to 1993

Maintained lab inventory; radiation safety; organized and presented experimental results

Skills acquired: Cell culture; protein, enzyme assays; enzyme, luciferase assays; antibody production

## Peer-reviewed publications

- Badillo AT, **Redden RA**, Zhang L, Doolin EJ, Liechty KW. (2007) Treatment of diabetic wounds with fetal murine stromal progenitor cells enhances wound closure and augments growth factor production. *Cell Tissue Res.* 329: 301-311.
- Danzer E, Kiddoo DA, **Redden RA**, Robinson L, Radu A, Zderic SA, Doolin EJ, Adzick NS, Flake AW. (2007) Structural and functional characterization of bladder smooth muscle in fetal rats with retinoic acid-induced myelomeningocele. *Am J Physiol Renal Physiol.* 292(1):F197-206.
- Redden RA**, Doolin EJ. (2006) Complementary roles of microtubules and microfilaments in the lung fibroblast-mediated contraction of collagen gels: dynamics and the influence of cell density. *In Vitro Cell Dev Biol Anim.* 42:70-74.
- Redden RA**, Doolin EJ. (2003) Collagen crosslinking and cell density have distinct effects on fibroblast-mediated contraction of collagen gels. *Skin Res Tech.* 9:290-293.
- Fishel RS, Eisenberg SE, **Redden RA**, Shai S-Y, Bernstein KE, Berk BC. (1995) Glucocorticoids induce angiotensin-converting enzyme expression in vascular smooth muscle. *Hypertension.* 25(3):343-349.
- Nunes GL, Sgoutas DS, **Redden RA**, Sigman SR, Gravanis MB, King SB 3rd, Berk BC. (1995) Combination of vitamins C and E alters the response to coronary balloon injury in the pig. *Arterioscler Thromb Vasc Biol.* 15(1): 156-165.

## Book Chapters

- Feldman D, Barker T, Blum B, Bowman J, Kilpadi D, **Redden R**. Tissue assessment of skin substitutes. In: Wise DL, ed. Biomaterials and Bioengineering Handbook. New York, Marcel Dekker, Inc. 2000. pp. 773-806.
- Feldman D, Barker T, Blum B, Bowman J, Kilpadi D, **Redden R**. Biomaterial-enhanced regeneration for skin wounds. In: Wise DL, ed. Biomaterials and Bioengineering Handbook. New York, Marcel Dekker, Inc. 2000. pp. 807-842.

## Scientific Abstracts (Presenter underlined)

- Redden RA, Volk SW, Zhang L, Doolin EJ, and Liechty KW. Dermal fibroblasts and stromal progenitor cells from diabetic mice have no impairment in contraction of the extracellular matrix. 21<sup>st</sup> Annual Symposium on Advanced Wound Care and The Wound Healing Society Meeting. San Diego, CA. April 2008.
- Redden RA, Badillo AT, Zhang L, Doolin EJ, Liechty KW. Stromal progenitor cells migrate in response to fibroblast-conditioned media and SDF-1 $\alpha$ . The Wound Healing Society, 17<sup>th</sup> Annual Meeting and Exhibition. Tampa, FL. April 2007.
- Redden RA, Badillo AT, Zhang L, Doolin EJ, Liechty KW. TGF- $\beta$ 1 inhibits and hypoxia enhances stromal progenitor-mediated contraction of collagen gels. The Wound Healing Society, 17<sup>th</sup> Annual Meeting and Exhibition. Tampa, FL. April 2007.
- Badillo AT, Chung S, **Redden RA**, Zhang L, Doolin EJ, Liechty KW. Stromal progenitor cells (SPC) upregulate SDF-1 $\alpha$  production in response to inflammation: a potential mechanism for SPC-mediated enhancement of impaired wound healing. The Wound Healing Society, 17<sup>th</sup> Annual Meeting and Exhibition. Tampa, FL. April 2007.

Badillo AT, Redden RA, Zhang L, Doolin EJ, Liechty KW. Isolation and Characterization of Fetal Stromal Progenitor Cells (SPC) for Use in Cellular Therapy for Chronic Non-healing Wounds. The Wound Healing Society, 17<sup>th</sup> Annual Meeting and Exhibition. Tampa, FL. April 2007.

Badillo AT, Chung S, Redden RA, Zhang L, Doolin EJ, Liechty KW. Stromal progenitor cells (SPC) correct the wound defect in MMP-9 knockout mice by enhanced reepithelialization not granulation tissue production. The Wound Healing Society, 17<sup>th</sup> Annual Meeting and Exhibition. Tampa, FL. April 2007.

Redden RA, Doolin EJ. Characterization of neuroblastoma cells cultured in three-dimensional, microgravity rotary bioreactor: organoid formation and free cell dynamics. 2006 In Vitro Biology Meeting. Minneapolis, MN. June 2006.

Redden RA, Badillo AT, Doolin EJ, Liechty KW. Comparison of mesenchymal stem cell- and dermal fibroblast-mediated contraction of collagen gels: potential differential effects in wound repair. The Wound Healing Society, 16<sup>th</sup> Annual Meeting and Exhibition. Scottsdale, AZ. May 2006.

Badillo AT, Redden RA, Doolin EJ, Liechty KW. Mesenchymal stem cells contract collagen gels: a basis for direct participation in wound healing. The Wound Healing Society, 16<sup>th</sup> Annual Meeting and Exhibition. Scottsdale, AZ. May 2006.

Badillo AT, Redden RA, Doolin EJ, Liechty KW. Collagen matrix induced morphologic changes regulate MSC function (poster only). The Wound Healing Society, 16<sup>th</sup> Annual Meeting and Exhibition. Scottsdale, AZ. May 2006.

Redden RA, Doolin EJ. Donor age, cell density, and complimentary roles of cytoskeletal elements in the contraction of fibroblast-populated collagen gels. 2005 World Congress on In Vitro Biology. Baltimore, MD. June 2005.

Redden RA, Doolin EJ. Characterization of neuroblastoma organoid growth in a low-shear, microgravity rotary bioreactor and comparison to *in vivo* tumors. 2004 World Congress on In Vitro Biology. San Francisco, CA. May 2004.

Redden RA, Doolin EJ. Complimentary roles of cytoskeletal elements in the contraction of lung fibroblast-populated collagen gels. Midwestern Tissue Engineering Consortium. Pittsburgh, PA. April 2004.

Redden RA, Doolin EJ. Dermal fibroblast-mediated contraction of collagen gels: the influence of donor age, cell concentration, and cytoskeletal elements (poster). Tissue Engineering Society International, 6<sup>th</sup> Annual Int'l Conference and Exposition. Orlando, FL. December 2003.

Redden RA, Doolin EJ. The role of the cytoskeleton in fibroblast-mediated contraction of collagen gels. Engineering Tissue Growth Int'l Conference and Exposition. Pittsburgh, PA. March 2003.

Redden RA, Doolin EJ. Collagen crosslinking and cell density have distinct effects on fibroblast-mediated contraction of collagen gels. 2002 U.S. Symposium of the International Society of Bioengineering and the Skin, Baltimore, MD. October 2002.

Redden RA, Eberhardt AW, Smith DR, Walker SG, Feldman DF. Quantitative clinical assessment of the burn scar. Wound Healing Society 10th Annual Educational Symposium, Toronto, Canada. June 2000.

Feldman D, Barker T, Blum B, Bowman J, Kilpadi D, **Redden RA.** (2000) Wound healing assessment of skin tissue scaffolds. *Trans World Biomaterials Congress.* 6:223.

Huang ST, Blum BE, Barker SD, Barker TH, Kilpadi DV, **Redden RA, Feldman DS.** (1999) In vivo evaluation of an adhesive albumin used for incision closure. *Trans Society for Biomaterials.* 25:43.

- Feldman DS, Barker TH, Blum BE, Kilpadi DV, **Redden RA**. (1999) Fibrin as a tissue adhesive and scaffold for meshed skin grafts in burn patients. *Trans Society for Biomaterials*. 25:160.
- Redden RA**, Eberhardt AW, Feldman DS. (1998) Quantitative in vivo mechanical testing of burn scar stiffness. *Ann Biomedical Engineering*. 26 Suppl 1: S-80.
- Redden RA**, Blum B, Kilpadi D, Feldman D. (1998) Quantitative assessment of wound healing rate. *Wound Repair and Regeneration*. 6(3):A246.
- Feldman D, **Redden RA**, Blum B, Osborne S. (1997) Porous fibrin as a degradable adhesive and drug delivery system. *Trans Society for Biomaterials*. 23:185.
- Blum B, Feldman D, Kilpadi D, **Redden RA**. (1997) Non-invasive assessment of regenerative skin systems. *Trans Society for Biomaterials*. 23:470.
- Blum B, Feldman D, Kilpadi D, **Redden RA**. (1997) Quantifying wound healing in pressure ulcers. *Wound Repair and Regeneration*. 5(1):A99.
- Watts RL, Obeso JA, Son H, Lanier VW, **Redden RA**. Performance of Self-Initiated Versus Stimulus-initiated voluntary wrist movement tasks in Parkinson Disease and normal subjects (poster only). American Academy of Neurology, 47th Session, Seattle, WA. May 1995.
- Nunes GL, **Redden RA**, Sgoutas DS, Berk BC. Vitamins C and E improve the response to balloon injury : Effect on Redox State. American Heart Association 66th Scientific Sessions, Atlanta, GA. Nov. 1993.
- Fishel RS, **Redden RA**, Bernstein KE, Berk BC. Angiotensin-converting enzyme and vascular injury: Synergistic upregulation by stress steroids and basic fibroblast growth factor. American Heart Association 65th Annual Scientific Sessions, New Orleans, LA. Nov. 1992.