May 20th, 12:30 PM

Lipoaspirate and Adipose Stem Cells as Potential Therapeutics for Chronic Scars

Dylan Perry
University of Massachusetts Medical School, dylan.perry@umassmed.edu

Jorge Lujan-Hernandez
University of Massachusetts Medical School, Jorge.lujan-hernandez@umassmed.edu

Michael S. Chin
University of Massachusetts Medical School, michael.chin@umassmed.edu

See next page for additional authors

Follow this and additional works at: http://escholarship.umassmed.edu/cts_retreat

Part of the Molecular, Cellular, and Tissue Engineering Commons, Plastic Surgery Commons, and the Therapeutics Commons

http://escholarship.umassmed.edu/cts_retreat/2016/posters/63

This material is brought to you by eScholarship@UMMS. It has been accepted for inclusion in UMass Center for Clinical and Translational Science Research Retreat by an authorized administrator of eScholarship@UMMS. For more information, please contact Lisa.Palmer@umassmed.edu.
Presenter Information
Dylan Perry, Jorge Lujan-Hernandez, Michael S. Chin, So-Yun Min, Ava Chappell, Raziel Rojas-Rodriguez, Raghu Appasani, Patrick Teebagy, Silvia Corvera, and Janice F. Lalikos

Keywords
scars, lipoaspirate, adipose, stem cells

Creative Commons License
This work is licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 License.

This poster abstract is available at eScholarship@UMMS: http://escholarship.umassmed.edu/cts_retreat/2016/posters/63
Lipoaspirate and Adipose Stem Cells as Potential Therapeutics for Chronic Scars

Dylan Perry, BA¹; Jorge Lujan-Hernandez, MD¹; Michael Chin, MD¹; So Yun Min²; Ava Chappell, BA¹; Raziel Rojas-Rodriguez¹; Raghu Appasani, BA¹; Patrick Teebagy, BA¹; Silvia Corvera, MD²; Janice F. Lalikos, MD¹

¹Division of Plastic Surgery, Department of Surgery, University of Massachusetts Medical School (UMMS), Worcester, MA
²Program in Molecular Medicine, UMMS, Worcester, MA

Introduction: Burn injuries can lead to hypertrophic or keloid scars, causing pain and long lasting mobility issues. Current therapies are often unsatisfactory, costly, or morbid. Prior studies suggest adipose derived stem cells (ADSCs) and lipoaspirate can improve scar outcomes of acute thermal wounds. Clinical reports suggest lipoaspirate and ADSCs can improve chronic burn scar remodeling. However, this has not been extensively studied in animal models. We sought to determine if adipose tissue can improve chronic scar remodeling and to compare the effects of ADSCs and processed lipoaspirate.

Methods: 50 CD1 nu/nu athymic mice received a standardized deep partial-thickness thermal burn. Scars matured for 6 weeks. Photographs and perfusion measurements by hyperspectral imaging (HSI) were taken over the entire study. Lipoaspirate and ADSCs (SVF and ex-vivo culture with flow cytometry confirmation) were obtained from a discarded human pannus specimen. After 6 weeks, animals received a 0.6cc subcutaneous graft beneath the scar of either: human lipoaspirate processed with the Coleman technique, high-dose (10⁶) hADSCs in Matrigel, low-dose (10⁴) hADSCs in Matrigel, Matrigel only, or not injected (n=10 per group). At 10 weeks, animals were sacrificed and scar tissue was harvested for histological and molecular analysis.

Results: HSI oxygenated hemoglobin values in lipoaspirate treated scars increased significantly more compared to 6-week pre-treatment baseline than all other groups (p<0.05). Planimetry analysis showed reduction in wound area in lipoaspirate treated mice compared to control groups (p<0.01). Blood vessel density quantification on Masson’s trichrome stains suggests increased density in lipoaspirate treated scars versus controls (p<0.01).

Conclusion: HSI, blood vessel density, and scar analysis suggest improvement in lipoaspirate treated scars compared to controls. Preliminary molecular data offers some insight to this trend. No effect was seen with ADSCs at either concentration at the analyzed timepoints. Molecular analyses are ongoing to investigate cellular mechanisms in regulating scar remodeling.

Presenter Contact:
Patrick Teebagy
patrick.teebagy@umassmed.edu
508-523-6339 or ex. 6-3723