

Stromal vascular fraction (SVF) is increasingly being used for therapeutic treatments; however, there is little data showing the characteristics of these cells. To the best of our knowledge, this is the first paper to investigate and compare the secretory factor profiles of SVF from subcutaneous adipose tissues from different body regions. Fifteen samples of adipose tissue were harvested from the abdomen, flanks, and thighs (five samples of each), of fifteen female donors ranging from 22 to 77 years of age. The SVF cell characteristics were then analyzed. Specifically, we looked at cell counts, viability, population doubling time, cell density, time to confluency, and secretory factor profiles. While no significant differences were found in cell viability or proliferation between body regions, levels of some secretory factors differed from the various body regions. These novel findings suggest that there are cytokine level variations in SVF cells depending on the body region the cells are harvested from. These variations may be considered when SVF is being used as a therapeutic treatment.¹

METHODS

SVF was isolated from adipose tissue from different body regions (abdomen, flanks, and the thighs) and cell morphology, viability, and proliferation were evaluated. About 1.8×10^4 cells were plated in 2-cm² culture dishes. The conditioned media (CM) was then collected after 72 hrs. The CM samples were filtered (0.22 μ m) and sent for multiplex immunoassay (Eve Technologies, Calgary, AB T2N 4Z5, Canada).

RESULTS

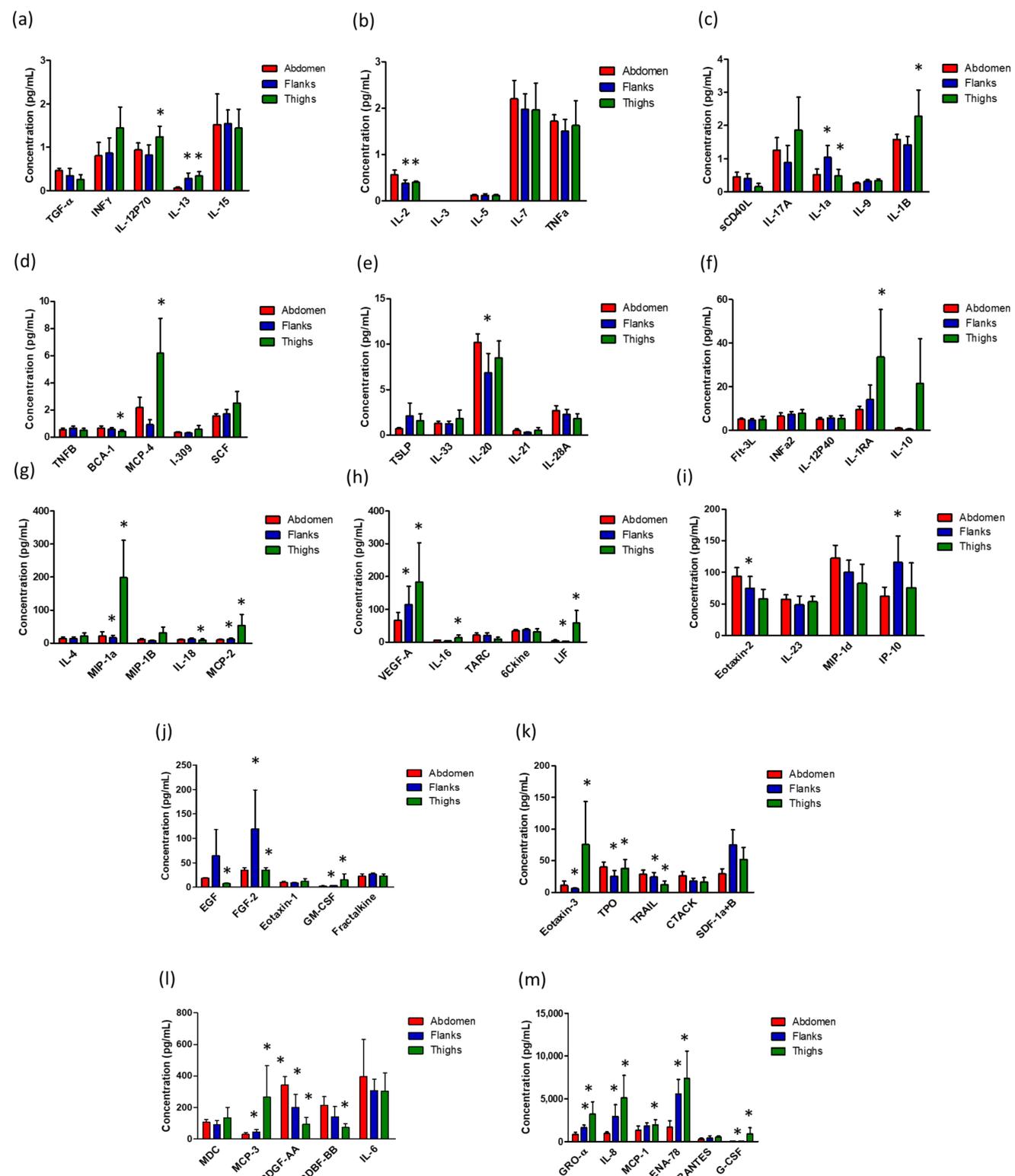
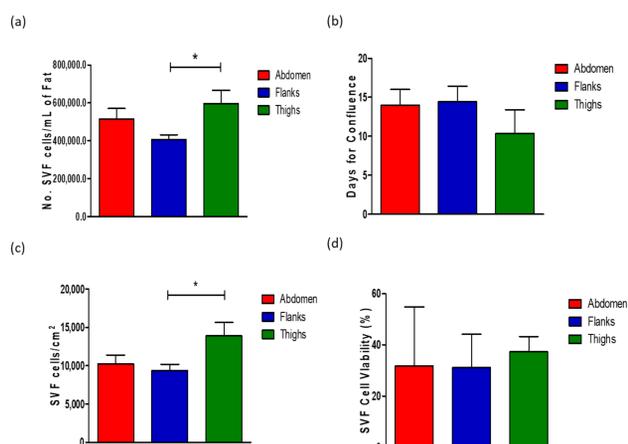


Fig. 3. Quantification of the secretory factors released by SVF cells in culture. (a – f) Secretory factors released at lower levels (0.1 – 60 pg/mL), (g – k) at medium levels (>60 – 400 pg/mL), and (l – m) at higher levels (> 400 pg/mL). * P < 0.05.



CONCLUSIONS

Our study demonstrated that proliferation and viability of SVF from different subcutaneous body regions is similar. The thighs showed a higher cell yield which may translate to better or faster clinical results. Despite this fact, the inconsistent clinical results seen with stem cell therapy, suggests a more important role of paracrine effects from the secretory factors. This is supported by the level of secretory factors being different depending on the body region from which the SVF is harvested. This knowledge allows us to further study local responses to several pathological conditions where subcutaneous adipose tissue is involved. This discovery along with future investigations focused on understanding local immunological responses based on the secretory factor levels may lead to clinical applications and the development of effective therapeutic products.

¹ Talavera-Adame D, Sidhu H, Rogowski N, Newman N. Comparative analysis of secretory factor profiles of human stromal vascular fraction by body region. Submitted to Tissue Engineering and Regenerative Medicine – Springer, 2019.