ECRONICON OPEN ACCESS

EC CLINICAL AND MEDICAL CASE REPORTS
Short Communication

# Interferon Regulatory Factors (IRFS) and Obesity: A Framework of Situtation

**Carmine Finelli**[1,2]*

[1]*Department of Internal Medicine, Ospedale Cav. R. Apicella, ASL Napoli 3 Sud, Via di Massa, Pollena (Napoli), Italy*

[2]*Covid Hospital Boscotrecase - ASL Napoli 3 Sud, Via Lenza, 3, Boscotrecase (Napoli), Italy*

***Corresponding Author:** Carmine Finelli, Department of Internal Medicine, Ospedale Cav. R. Apicella – ASL Napoli 3 Sud, Via di Massa, Pollena and Covid Hospital Boscotrecase - ASL Napoli 3 Sud, Via Lenza, 3, Boscotrecase (Napoli), Italy.

**Received:** December 06, 2021; **Published:** December 31, 2021

Metaflammation, also known as metabolic inflammation, is connected to obesity and its comorbidities, such as hypertension, cardiovascular disease, insulin resistance, and type 2 diabetes (T2D) [1]. Obese patients have both subcutaneous and intra-abdominal (visceral) fat deposition, and changes in the adipose tissue compartment are critical for the development of metabolic inflammation and insulin resistance [2,3]. Adipose tissue is an active endocrine organ as well as an energy storage organ [4]. While small adipocytes in lean people are associated to metabolic balance, larger adipocytes in obese people engage activated macrophages and release adipokines [5]. Larger adipocytes emit adipokines, which function in tandem with proinflammatory cytokines/chemokines secreted by nearby macrophages to enhance adipose inflammation and insulin resistance [6].

TNF-α is a powerful proinflammatory cytokine released by macrophages and adipocytes, particularly visceral adipose tissue, and is regarded a crucial indicator of adipose inflammation. This cytokine plays a direct role in insulin and glucose metabolism, as well as insulin resistance and lipolysis stimulation [7]. Increased TNF-α levels in obesity and their correlation with BMI have been documented in both human and animal model studies [8]. In addition to macrophages, T cells, endothelial cells, fibroblasts, and skeletal muscle, IL-6 is a pro-inflammatory cytokine produced primarily by adipocytes. IL-6 is a proinflammatory cytokine that also functions as an anti-inflammatory myokine. IL-6 impacts glucose metabolism, and higher IL-6 levels in the blood have been seen in obese and/or T2D patients; however, its involvement in the development of insulin resistance is still debated [9, 10]. Other proinflammatory cytokines that may be elevated in obesity/T2D and contribute to metaflammation may include IL-1β, IL-18, and IL-23 [11].

Chemotactic cytokines, also known as chemokines, are small proteins that communicate by activating receptors with seven transmembrane domains. CXC, CC, CX3C, and XC chemokines are the four subfamilies of chemotactic cytokines. Chemokines are chemoattractants that direct leukocyte migration, a process known as directed chemotaxis. The signature inflammatory chemokines include CXCL-1/5/8/9, CCL-2/3/4/5/7, and CX3CL1 [12].

The interferon regulatory factors (IRFs) family of transcription factors plays a critical role in the regulation of immunity and induction of type I interferons (IFN-α/β) [13]. IRFs are a group of nine transcription factors (IRF1-9) that are involved in Toll-like and other pattern recognition receptor-mediated immunoregulation and immune cell development. IRFs are currently being recognized as adipogenesis transcriptional regulators [14]. Although IRF5 has been linked to macrophage polarization toward the inflammatory M1-phenotype, the association between alterations in IRF5 adipose expression and other indicators of adipose inflammation in T2D and obesity remains unknown [15].

## Disclosure Statement

The author declare that there are no conflicts of interest.

## Bibliography

1. Finelli C. "Metabolic Syndrome and Inflammasomes: A Framework of Situation". *EC Clinical and Medical Case Reports* 4.10 (2021): 29-31.

2. Finelli C., *et al*. "Should visceral fat be reduced to increase longevity?" *Ageing Research Reviews* 12.4 (2013): 996-1004.

3. Finelli C. "Visceral Fat and Diabetes: A Direct Relationship?". *EC Diabetes and Metabolic Research* 4.3 (2020): 01-02.

4. Finelli C. "A New Endocrine "Gland": Adipose Tissue". *EC Endocrinology and Metabolic Research* SI.02 (2020): 07-09.

5. Chait A and Den Hartigh LJ. "Adipose Tissue Distribution, Inflammation and Its Metabolic Consequences, Including Diabetes and Cardiovascular Disease". *Frontiers in Cardiovascular Medicine* 7 (2020): 22.

6. Appari M., *et al*. "Metabolic Regulation of Adipose Tissue Macrophage Function in Obesity and Diabetes". *Antioxid Redox Signal* 29.3 (2018): 297-312.

7. Sethi JK and Hotamisligil GS. "Metabolic Messengers: tumour necrosis factor". *Nature Metabolism* 3.10 (2021): 1302-1312.

8. Mikhailova SV and Ivanoshchuk DE. "Innate-Immunity Genes in Obesity". *Journal of Personalized Medicine* 11.11 (2021): 1201.

9. Villar-Fincheira P., *et al*. "Role of Interleukin-6 in Vascular Health and Disease". *Frontiers in Molecular Biosciences* 8 (2021): 641734.

10. Nara H and Watanabe R. "Anti-Inflammatory Effect of Muscle-Derived Interleukin-6 and Its Involvement in Lipid Metabolism". *International Journal of Molecular Sciences* 22.18 (2021): 9889.

11. Kuryłowicz A and Koźniewski K. "Anti-Inflammatory Strategies Targeting Metaflammation in Type 2 Diabetes". *Molecules* 25.9 (2020): 2224.

12. Hughes CE and Nibbs RJB. "A guide to chemokines and their receptors". *The FEBS Journal* 285.16 (2018): 2944-2971.

13. Jefferies CA. "Regulating IRFs in IFN Driven Disease". *Frontiers in Immunology* 10 (2019): 325.

14. Yanai H., *et al.* "The IRF family of transcription factors: Inception, impact and implications in oncogenesis". *Oncoimmunology* 1.8 (2012): 1376-1386.

15. Sindhu S., *et al*. "Enhanced Adipose Expression of Interferon Regulatory Factor (IRF)-5 Associates with the Signatures of Metabolic Inflammation in Diabetic Obese Patients". *Cells* 9.3 (2020): 730.

**Volume 5 Issue 1 January 2022**