**REPLY TO REVIEWER’S COMMENTS**

The authors would like to thank the reviewers for their valuable suggestions. The changes have been made in the manuscript accordingly and mentioned in red color font. Point wise reply is as follows:

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| **SI No.** | **COMMENTS** | **REPLY** |
|  | **Reviewer#1 specific comments** |  |
|  | In some sections more references could be included to support the arguments.  Below are some comments that could improve the manuscript: | References supporting the statements have been added |
| 1.1 The Role of Leptin in Aging. Leptin and Cellular Processes:  …. Moreover, it may contribute to the repair of damaged DNA, thus  participating in the preservation of cellular integrity [6]….. Reference 6  is related to a liver tumor line, not to a physiological process such as  aging. It would be more convenient to look for a more accurate reference.  1.2 The intricate interaction between leptin and cellular aging involves the  modulation of key pathways, including those related to oxidative stress and  inflammation [7]. (reference 7 is restricted only to the muscle. You could  look for some more reference.  1.3 Impact on Telomeres:  Telomeres, the protective caps at the end of chromosomes, play a vital role  in cellular aging. Research suggests that leptin may have an impact on  telomere length maintenance. (It should be supported by some reference)  1.4 Interaction with Insulin:  Leptin's interaction with insulin forms a crucial aspect of its involvement  in aging. These hormones share a delicate relationship in regulating  metabolism. Leptin, produced by adipose tissue, signals the brain about the  body's energy status, influencing appetite and energy expenditure. In  tandem, insulin regulates glucose metabolism.( Insulin at the brain level  has many effects also related to the effects of leptin that should at least  be mentioned.) Dysregulation in either of these systems can contribute to  age-related metabolic disorders [9]. In my opinion reference no. 9 should be  no. 10  1.5 However, in mammals, the sequence of hormone actions is unresolved due  to the interdependence of insulin, insulin-like growth factor-1, growth  hormone, and thyroid hormones. (It should be supported by some reference)  1.6 Despite parallels in insulin-like peptides and signal cascades across  mammals and invertebrates, additional research is needed to determine if  these signals uniformly control aging mechanisms across species [10]. In my  opinion this reference does not correspond to the text.  1.7 Leptin and Age-Related Diseases  Diabetes mellitus:  Administration of leptin as a therapeutic intervention has been documented  to ameliorate insulin resistance in muscles and the liver among individuals  with lipodystrophy. (It should be supported by some reference)  1.8 Additionally, it has been shown to inhibit liver gluconeogenesis,  suppress lipolysis, and mitigate fasting hyperglycemia in animal models with  diabetes [14].( reference 14 is a Review Article from clinical data, not  from animal models.  1.9 Neurodegenerative diseases: Leptin treatment induces an increase in ATP  and p-Akt levels while concurrently reducing lactate dehydrogenase. For  greater clarity all abbreviations should be explained (p-AKT)  1.10 Leptin in Longevity….. In both leptin receptor mutant db/db mice and  leptin-deficient ob/ob mice, there is an absence of SIRT1 activation in the  hypothalamus in response to CR [26]. This reference 26 does not refer to  animal models s but with patients  There are also some typographical errors:  - Interaction with Insulin: Understanding how leptin influences insulin  sensitivity provides insights into potential interventions to mitigate the  impact of aging on metabolic health (.) Reduced insulin-like peptide  signaling extends the lifespan of nematodes, flies, and rodents….. I  - Reduced insulin-like peptide signalling extends the lifespan of nematodes,  flies, and rodents. | Section has been rewritten with suitable references  Suitable references have been added  Section has been rewritten with suitable references  Section has been rewritten with suitable references  Section has been rewritten with suitable references  Section has been rewritten with suitable references  Suitable references have been added  Section has been rewritten with suitable references  Full forms have been mentioned  Section has been rewritten with suitable references  Section has been rewritten with suitable references |
|  | **Reviewer#2 specific comments** |  |
|  | Originality and Novelty. The review article titled "Leptin and Aging:  Intriguing link to Gut microbiota" reviews the different functions of leptin  in relation to aging apart from the regulation of appetite and metabolism.  Although the title seems to point only to the relationship with the  microbiota, different aspects are analyzed, so the title perhaps deserved to  be modified for a more generic one.  Quality of Language. The language in which it is written is clear and  concise, which makes its content understandable.  However, there are some typographical errors:  - Interaction with Insulin: …..Understanding how leptin influences  insulin sensitivity provides insights into potential interventions to  mitigate the impact of aging on metabolic health (.) Reduced insulin-like  peptide signaling extends the lifespan of nematodes, flies, and rodents…..  I  - Reduced insulin-like peptide signalling extends the lifespan of nematodes,  flies, and rodents | Title has been modified  Section has been rewritten with suitable references |