



# Statement of Retraction

## Statement of Retraction. Physical Exercise Reduces Circulating Lipopolysaccharide and TLR4 Activation and Improves Insulin Signaling in Tissues of DIO Rats. *Diabetes* 2011;60:784–796. DOI: 10.2337/db09-1907

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The above-cited article has been retracted by the American Diabetes Association, the publisher of *Diabetes*. This article was previously the subject of an expression of concern in the March 2015 issue of the journal (*Diabetes* 2015;64:1068–1070. DOI: 10.2337/db15-ec03).

As noted in the March 2015 expression of concern, the American Diabetes Association asked the corresponding author's institution, the University of Campinas, to review the following issues with the article:

- An image published previously by the same laboratory in *PLOS ONE* (Calisto et al. *PLoS ONE* 2010. DOI: 10.1371/journal.pone.0014232) appears to be duplicated in this article. Figure 4B (bands 2–4) from the *PLOS ONE* article reappears in Fig. 3D (bands 1–3) in the article cited above, with horizontal rotation.
- Figure 7 of the above-cited article appears to contain several instances of duplicated and overlapping bands. Specifically, these duplications appear in Fig. 7D (lane 1) and Fig. 7E (lane 3), Fig. 7D (lane 3) and Fig. 7E (lane 1), Fig. 7D (lane 4) and Fig. 7E (lane 2), Fig. 7D (lane 5) and Fig. 7E (lane 5), and Fig. 7D (lane 7) and Fig. 7E (lane 7).

The issues described in the March 2015 expression of concern were then reviewed by an investigative commission appointed by the University of Campinas.

The university commission concluded that there is no splicing in Fig. 3D and that the figure published in *Diabetes* is correct. According to the commission's report, a co-author of this article mistakenly took bands 2, 3, and 4 from this figure, rotated them horizontally, spliced them with band 1 from the original figure used for Fig. 4B of the *PLOS ONE* article, and then presented the altered Fig. 4B in the *PLOS ONE* publication. The authors submitted a corrigendum to *PLOS ONE* to correct Fig. 4B, and the correction was accepted and published on 3 March 2015 ([dx.doi.org/10.1371/journal.pone.0118383](https://doi.org/10.1371/journal.pone.0118383)).

The university commission also concluded that Fig. 7D showed evidence of duplication with Fig. 7E, specifically between Fig. 7D (lane 1) and Fig. 7E (lane 3), Fig. 7D (lane 3) and Fig. 7E (lane 1), Fig. 7D (lane 4) and Fig. 7E (lane 2), Fig. 7D (lane 5) and Fig. 7E (lane 5), and Fig. 7D (lane 7) and Fig. 7E (lane 7). These duplications were confirmed by the testimony of the lead author. Therefore, the university commission recommended a "partial retraction" of Fig. 7D, keeping the rest of the article intact.

The university commission's report and recommendation were reviewed by the American Diabetes Association's Panel on Ethical Scientific Programs (ESP).

Despite the university's assessment, the ESP still had concerns about the integrity of the quantification and analysis described in Fig. 3D. According to the original publication, the analysis was performed 6–8 times, but it is not possible to confirm this because no other analyses were offered. In addition, the ESP determined that a partial retraction would not serve as a clear and appropriate update to the publication status

of this article, as the selective retraction of a key portion of the data would only raise more questions about the overall reliability of the research presented in the article.

It should be noted that the ESP was informed by readers of additional concerns involving other data presented in this article. The investigative commission appointed by the University of Campinas did not identify or address these additional concerns in its investigative report. These concerns, which have been reviewed by the ESP and recently reported to the university, include the following:

- In Fig. 2A, B, C, and D, the standard errors of the DIO group appear to have identical quantification values.
- In Fig. 2G, IB:TLR4, lanes 1 and 3 appear to be duplicates.
- In Fig. 3A, the IB:IKK $\beta$  strip appears to have been previously published in other independent and unrelated experiments:

Prada et al. *FEBS Lett* 2006;580:4889–4894. DOI: 10.1016/j.febslet.2006.08.004. PMID: 16919274 (Fig. 4C, IB:IRS-1, with horizontal and vertical rotation)

Tsukumo et al. *Diabetes* 2007;56:1986–1998. DOI: 10.2337/db06-1595. PMID: 17519423 (Fig. 5B, Akt, lanes 1–4)

Ropelle et al. *Endocrinology* 2007;148:5220–5229. DOI: 10.1210/en.2007-0381. PMID: 17717055 (Fig. 2D, total AMPK, and Fig. 2F,  $\alpha$ -tubulin, with horizontal and vertical rotation)

Ropelle et al. *Diabetes* 2008;57:594–605. DOI: 10.2337/db07-0573. PMID: 18057094 (Fig. 6L, total eIF4E, with horizontal and vertical rotation)

De Souza et al. *J Physiol* 2010;588(Pt. 12):2239–2253. DOI: 10.1113/jphysiol.2009.183996. PMID: 20421289 (Fig. 1C, IB:IRS2, and Fig. 1G, IB:Foxo1)

This image may also have been subsequently republished in the following 2012 *Critical Care* article:

Calisto et al. *Crit Care* 2012;16:R158. DOI: 10.1186/cc11478. PMID: 22897821 (Fig. 4B, IB:Akt, lanes 1–4)

- In Fig. 3D, the second band of the IB:pJNK strip appears to be the same as the four IB:JNK bands in Fig. 4B of the *PLOS ONE* article and the resupplied image in the *PLOS ONE* correction, but at a different exposure, size adjusted, and horizontally rotated.
- In Fig. 3I, the IB:IRS1 strip appears to have been previously published in Fig. 6B of the following 2010 *PLOS Biology* article, with horizontal rotation and brightness/contrast adjustments:

Ropelle et al. *PLoS Biol* 2010;8:e1000465. DOI: 10.1371/journal.pbio.1000465. PMID: 20808781 (Fig. 6B, IB: $\alpha$ -tubulin, lanes 2–5)

- In Fig. 4B, D, E, F, and H, the standard errors of the control group appear to have identical quantification values.
- In Fig. 4I, IB:Akt, lanes 2 and 7 and lanes 3 and 8 appear to be duplicates.
- In Fig. 6I, IB:pJNK, lanes 1 and 4 appear to be duplicates.
- In Fig. 8F, the numbers of lanes in IB:pJNK ( $n = 4$ ) and IB:JNK ( $n = 5$ ) do not match.

On the basis of its review of the university commission's report and the additional concerns described above, the ESP believes that the study as a whole is unreliable and that the only responsible course of action for updating the status of *Diabetes* 2011;60:784–796 is to issue a full retraction. The American Diabetes Association, the publisher of *Diabetes*, approved the Panel's recommendation.

*Diabetes* is a member journal of the Committee on Publication Ethics (COPE) (publicationethics.org). As such, the editors of the journal and the ESP refer to COPE's guidelines and recommendations when reviewing such matters.