Glyphosate, Akkermansia, and GLP-1

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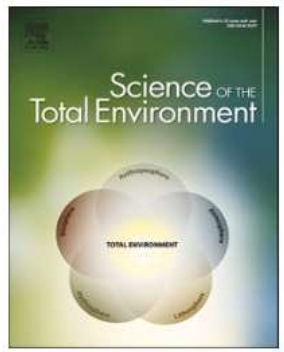
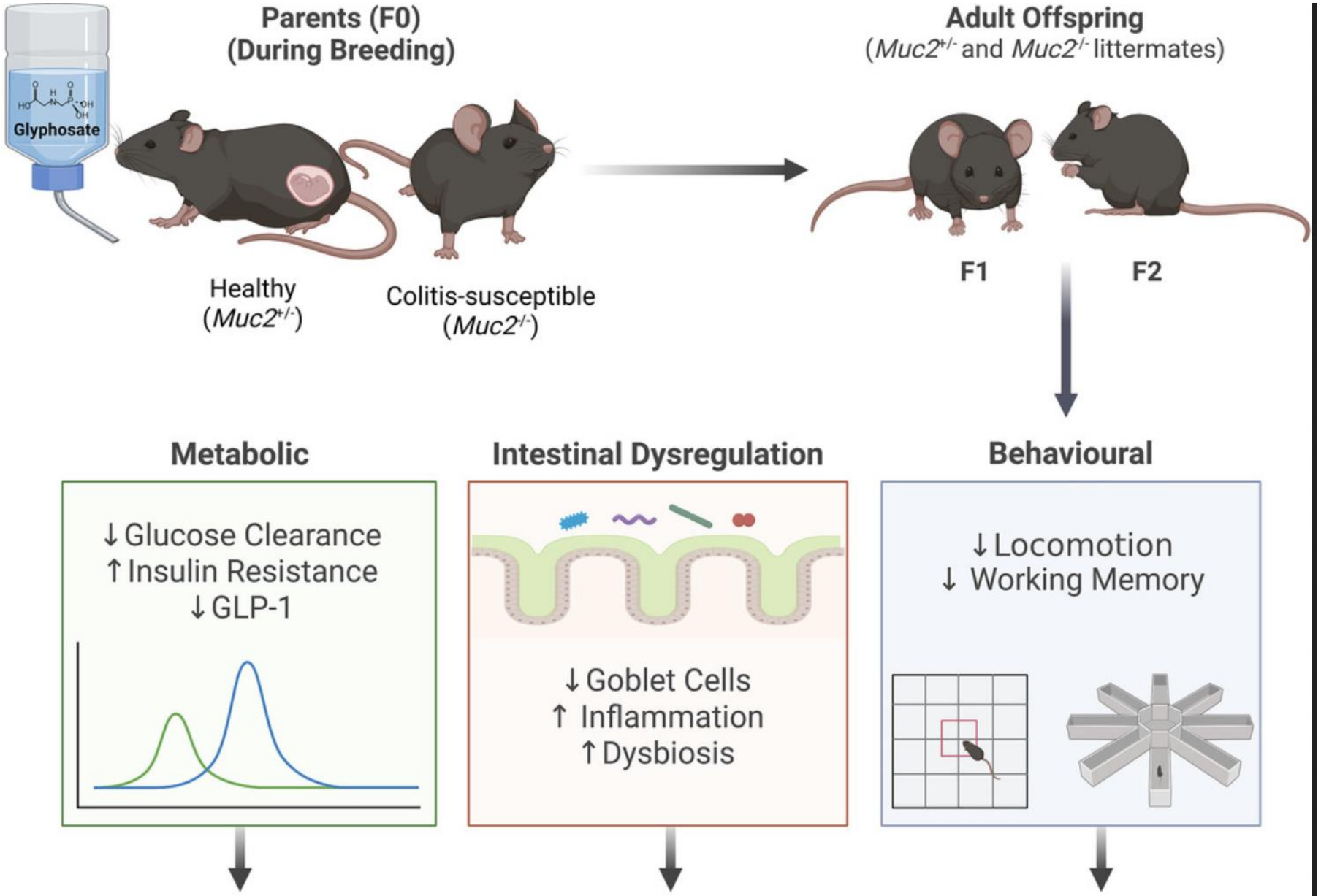


Prenatal exposure to dietary levels of glyphosate disrupts metabolic, immune, and behavioral markers across generations in mice

J.A. Barnett [a], J.K. Josephson [a], E. Yuzbashian [a], N. Haskey [a], M.M. Hart [a], K.K. Soma [b,c,d], A. Verdugo [a], C.J. McComb [a], M.L. Bandy [a], S. Ghosh [a], C. Letef [a], A. Copp [a], R. Ishida [a], J. Gibon [a], J. Ye [a], R.T. Giebelhaus [e,f], S.J. Murch [e], M.M. Jung [b], D.L. Gibson [a,g,*]


Glyphosate
Parents (F0)
(During Breeding)
Healthy
(Muc2+/-)
Colitis-susceptible
(Muc2-/-)
Adult Offspring
(Muc2+/- and Muc2-/- littermates)
F1
F2
Metabolic
↓Glucose Clearance
↑Insulin Resistance
↓GLP-1
Intestinal Dysregulation
↓Goblet Cells
↑ Inflammation
↑Dysbiosis
Behavioural
↓Locomotion
↓ Working Memory
Microbiome-Metabolite Disruption

Highlights

- Prenatal glyphosate reshapes gut, metabolism and behaviour across multiple mouse generations.
- Harmful effects arise at 0.01mg/kg/day, a dose far beneath current safety limits.
- Gut barrier damage, mucin loss and inflammation persist into the F2 generation.
- Glyphosate-linked microbiome shifts disrupt endocrine and tryptophan pathways.
- Dose- and generation-based host-microbe rewiring suggests heritable gut-brain-immune disruption.

Quotes from the paper

- "Akkermansia muciniphila was depleted, while Parabacteroides spp. and Christensenellaceae were enriched."
- “Akkermansia muciniphila abundance was positively correlated with GLP-1 levels (ρ =0.428. p = 0.011), whereas Parabacteroides distasonis showed a significant negative correlation with GLP-1.”
- “These findings suggest that prenatal glyphosate exposure, even below regulatory thresholds, may disrupt multiple physiological systems across generations, highlighting the need for further research and potential regulatory consideration.”

The popular weight-loss drug, Wegovy, is a GLP-1 Analogue

Cell Metabolism
Previews

A newly identified protein from *Akkermansia muciniphila* stimulates GLP-1 secretion

nature microbiology

LETTERS

https://doi.org/10.1038/s41564-021-00880-5

Check for updates

Akkermansia muciniphila secretes a glucagon-like peptide-1-inducing protein that improves glucose homeostasis and ameliorates metabolic disease in mice

Hyo Shin Yoon[1,9], Chung Hwan Cho[1,9], Myeong Sik Yun[1], Sung Jae Jang[1], Hyun Ju You[1,2,3,4], Jun-hyeong Kim[5], Dohyun Han[6], Kwang Hyun Cha[7], Sung Hyun Moon[1,5], Kiuk Lee[5], Yeon-Ji Kim[8], Sung-Joon Lee[8], Tae-Wook Nam[5] and GwangPyo Ko[1,3,4,5] ✉

Published: May 10, 2024*

Poll: 1 in 8 Adults Say They've Taken a GLP-1 Drug, Including 4 in 10 of Those with Diabetes and 1 in 4 of Those with Heart Disease

About Half Who Have Taken the Drugs Say It Was Difficult to Afford Even with Insurance

*https://www.kff.org/health-costs/poll-1-in-8-adults-say-theyve-taken-a-glp-1-drug-including-4-in-10-of-those-with-diabetes-and-1-in-4-of-those-with-heart-disease/

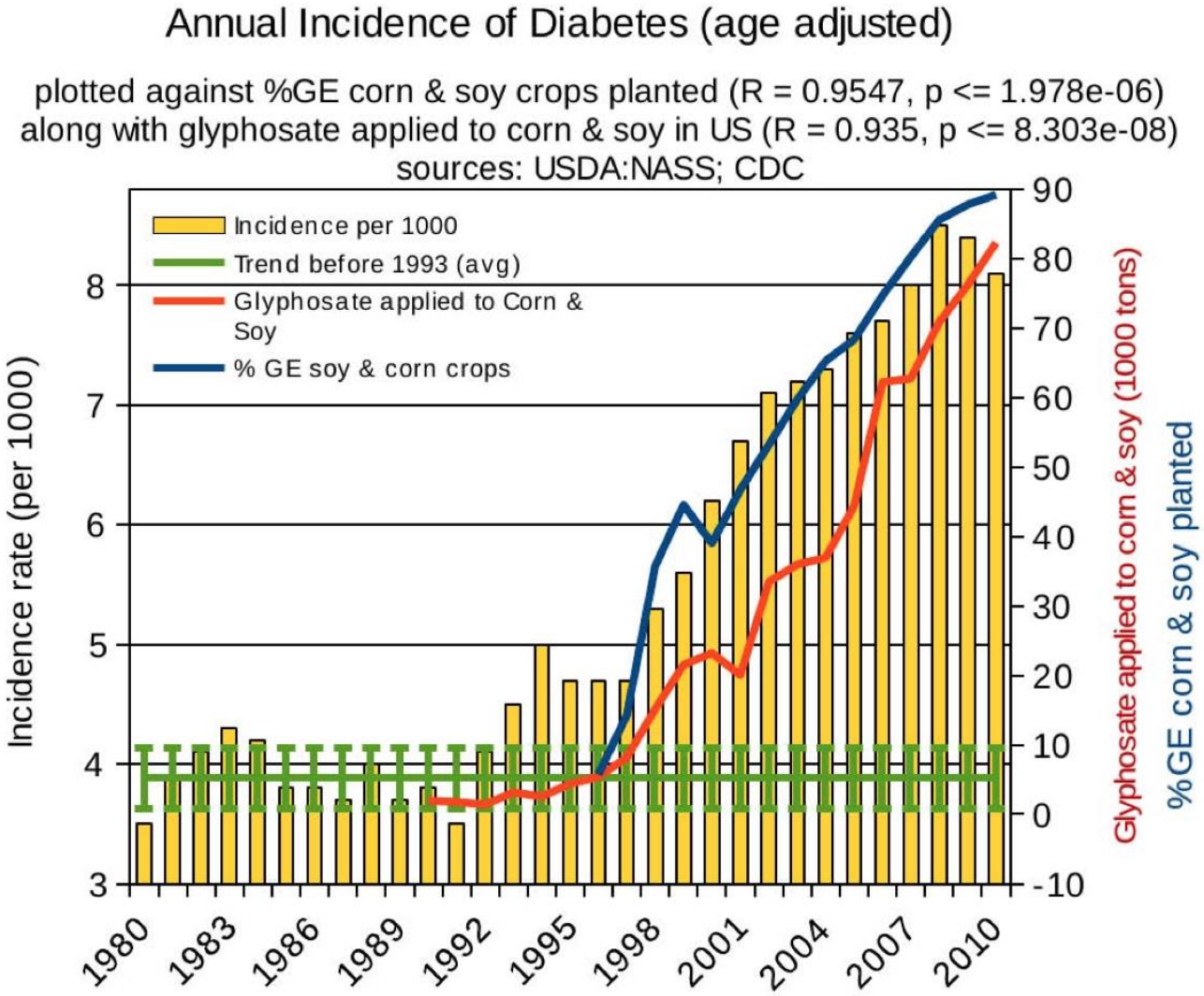


Figure 14. Correlation between age-adjusted diabetes incidence and glyphosate applications and percentage of US corn and soy crops that are GE.

*From NL Swanson et al. Journal of Organic Systems, 9(2), 2014.

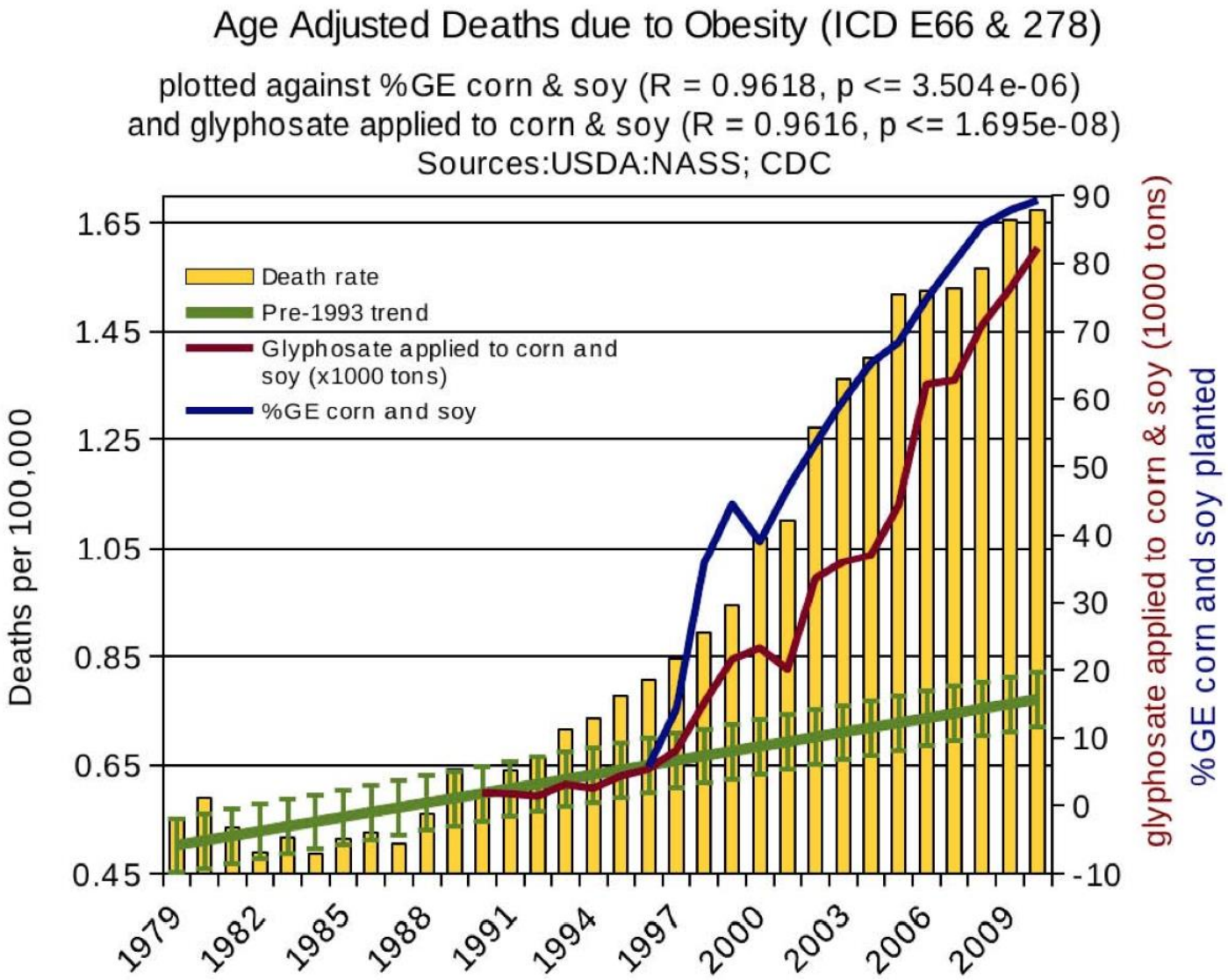


Figure 13. Correlation between age-adjusted obesity deaths and glyphosate applications and percentage of US corn and soy crops that are GE.

*From NL Swanson et al. Journal of Organic Systems, 9(2), 2014.