

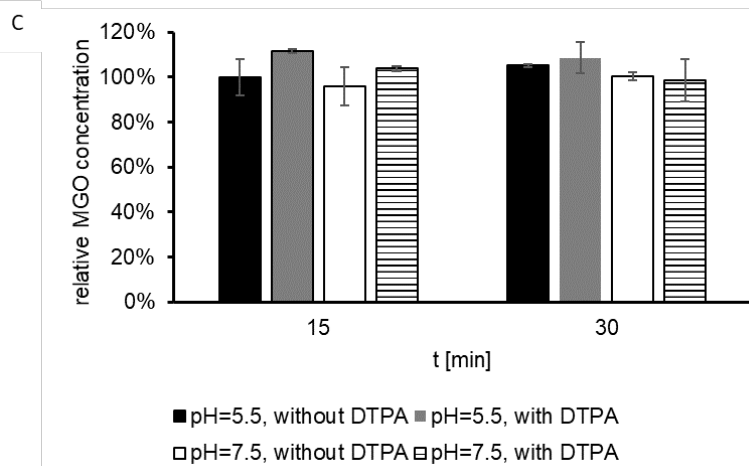
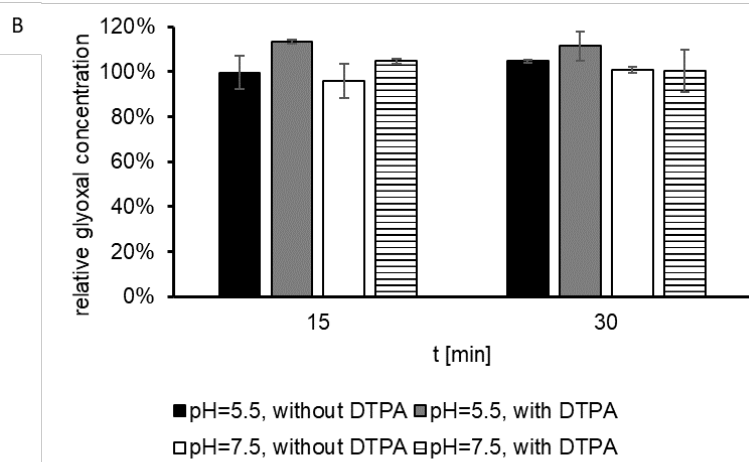
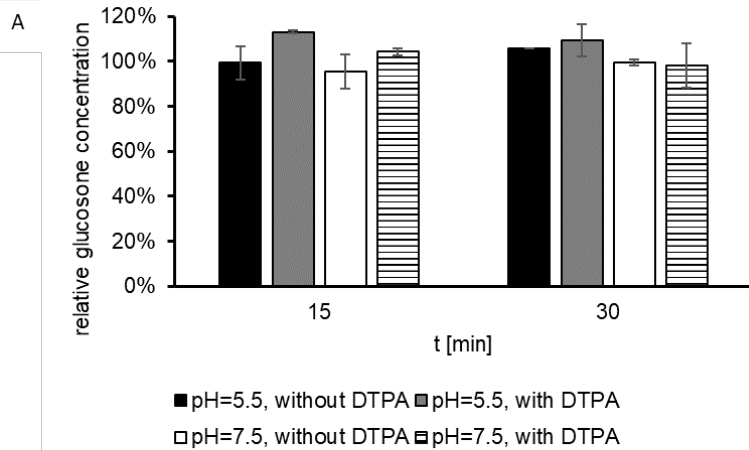
## Supplementary Material

# **Metal cations promote $\alpha$ -dicarbonyl formation in glucose-containing peritoneal dialysis fluids**

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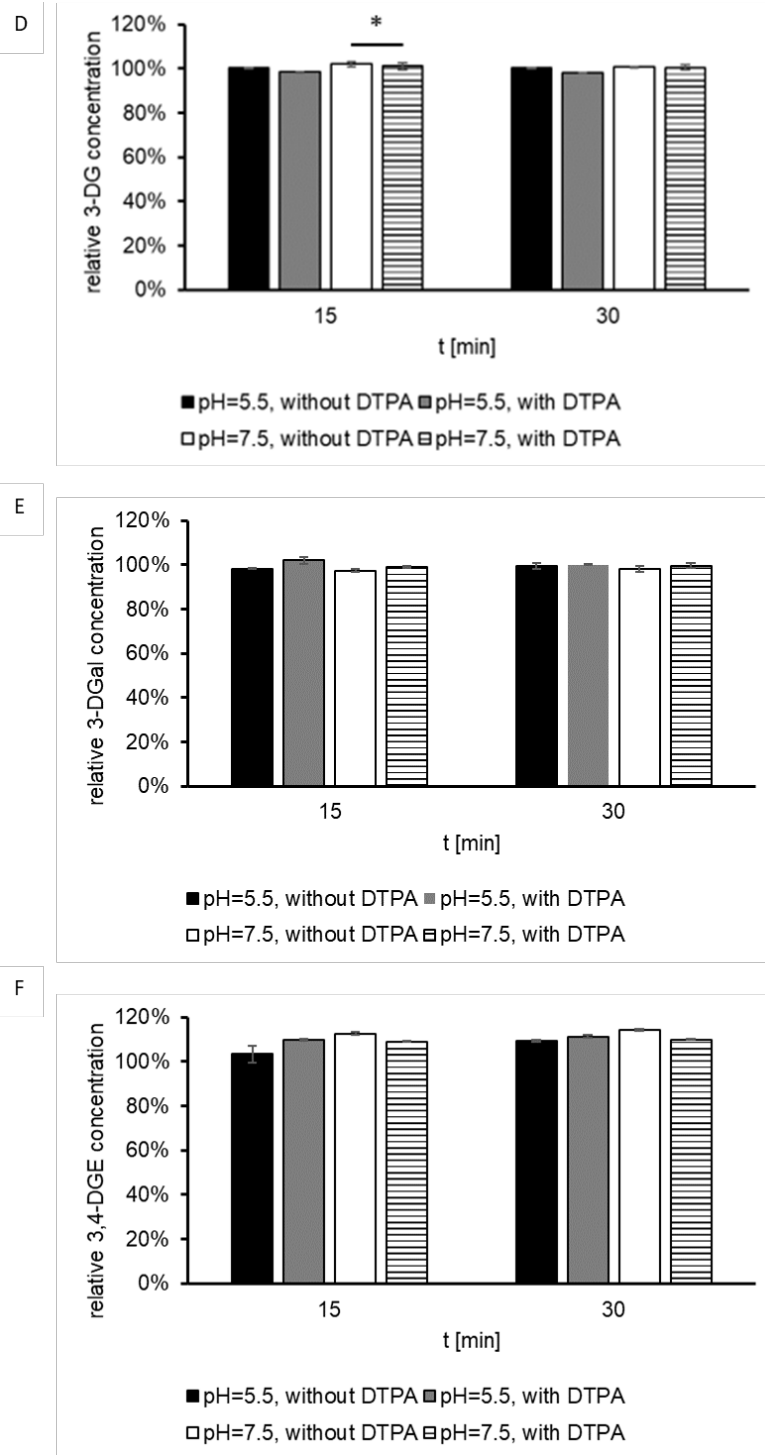


**Fig. S1** Stability of GDPs at pH 5.5 and 7.5 with and without DTPA (A, glucosone; B, glyoxal, C, methylglyoxal, D, 3-deoxyglucosone, E, 3-deoxygalactosone, F, 3,4-DGE). Solutions of the GDPs were derivatized directly or 15 and 30 min after sterilization. The concentrations at 0 min were used as reference (100%). Mean values  $\pm$  standard deviations of triplicates are displayed. A two-tailed, paired t-test was calculated to show differences between the samples with and without DTPA (\* $p < 0.05$ ). Statistically significant differences were not observed unless marked.

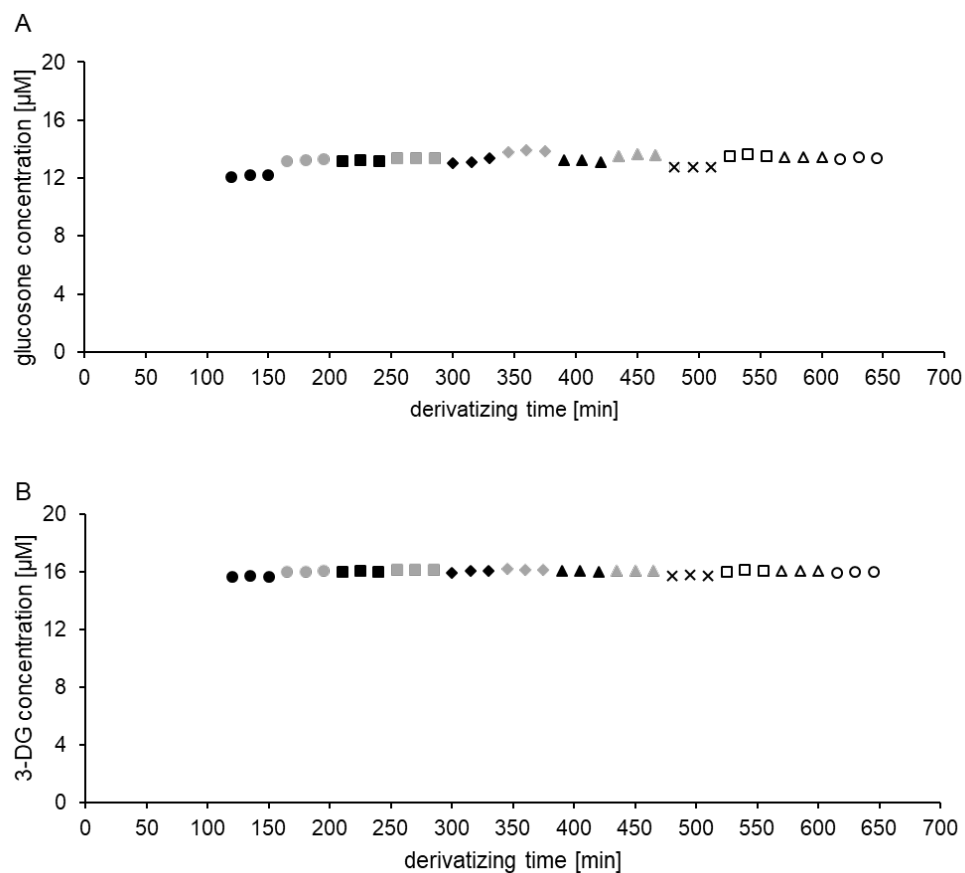


**Fig. S2** Effect of the derivatizing time on the concentration of (A) glucosone and (B) 3-DG in different unheated PDFs at pH 5.5 containing conventional electrolytes and additional metal cations. The samples contained either zinc(II) (●), molybdenum(II) (◐), copper(II) (■), lithium(I) (▣), chromium(III) (◆), iron(II) (◈), iron(III) (▲), manganese(II) (X), nickel(II) (▲), vanadium(II) (□), aluminum(III) (△), or no additional inorganic cations (○).

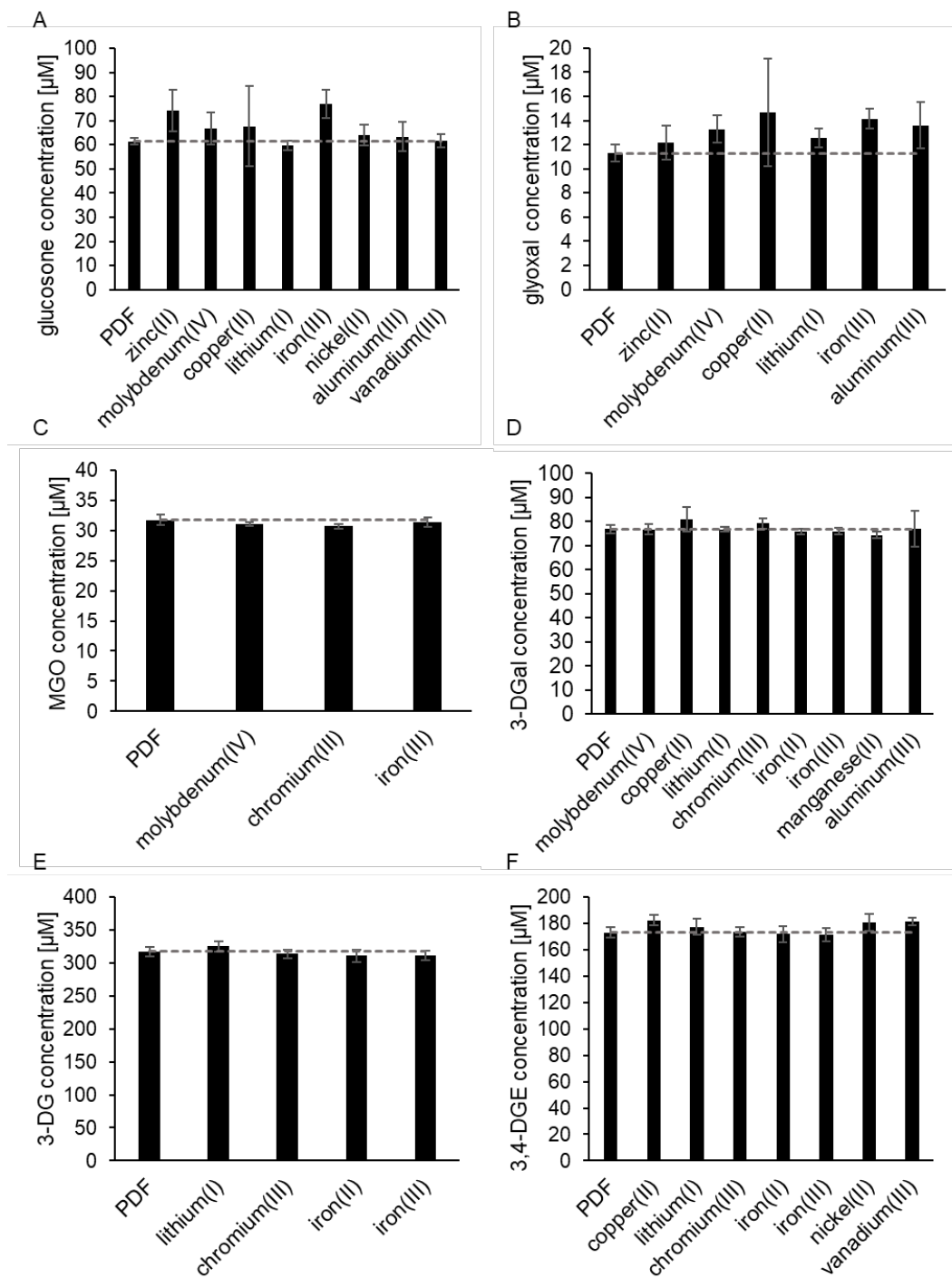


**Fig. S3** Concentration of six GDPs in PDF (pH 5.5, 4.25% glucose; control) and the same fluid spiked with different metal cations. The diagrams show non-significant differences. Mean values  $\pm$  standard deviations of triplicates are displayed. A two-tailed, paired t-test was calculated to show differences between the control and the spiked PDF.

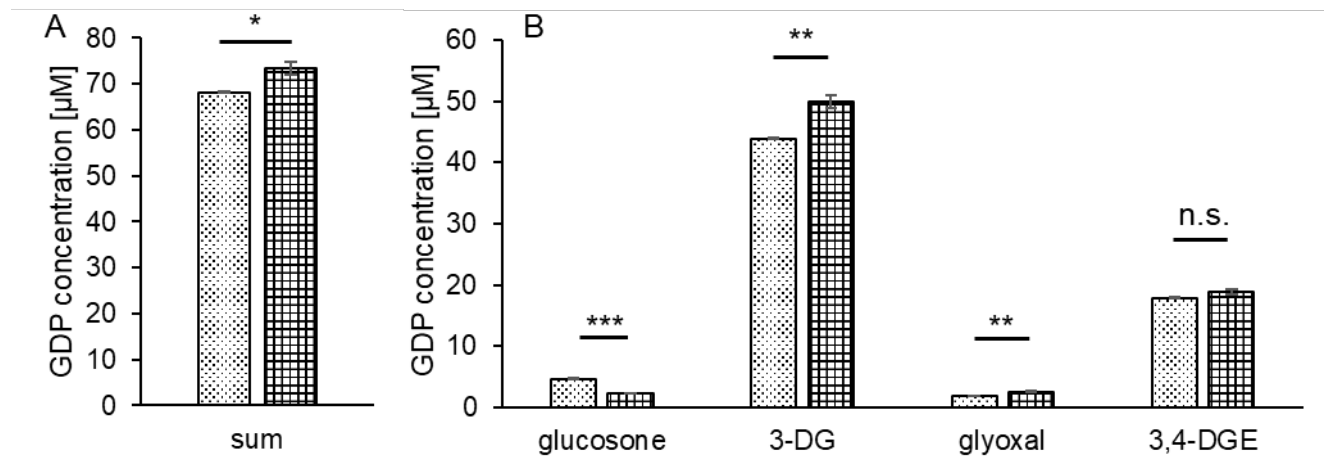


**Fig. S4** Concentrations of (A) total and (B) individual GDPs in heat-sterilized PDFs containing 4.25% glucose and conventional electrolytes at pH 3.1 with DTPA (grid bars) and without DTPA (dotted bars). Mean values  $\pm$  standard deviations of triplicates are displayed. A two-tailed, paired t-test was calculated to show differences between the samples with and without DTPA (n.s. not significant, \*  $p < 0.05$ , \*\*\*  $p < 0.001$ ). At pH 3.1, 3-DGal coeluted with 5-hydroxymethylfurfural so that it could not be quantified in these samples. MGO was below the limit of quantification.

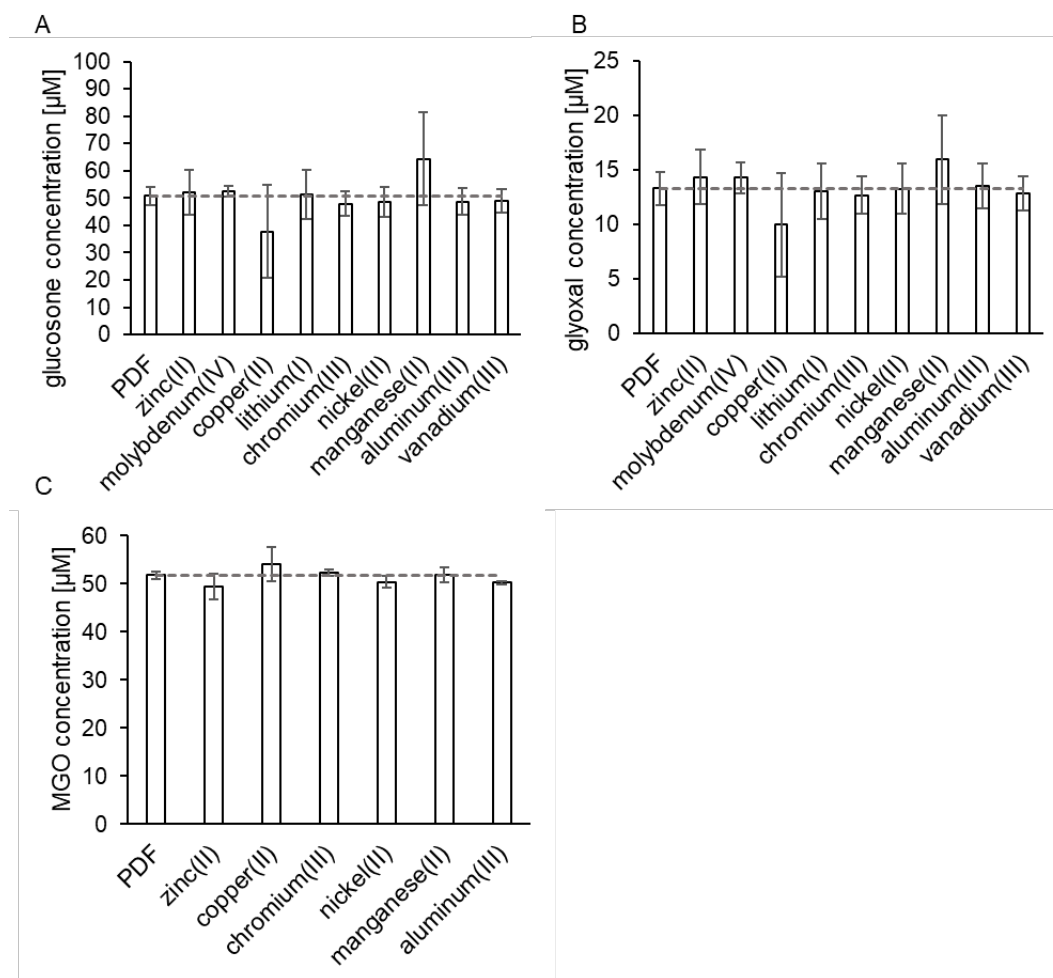


**Fig. S5** Concentration of (A) glucosone, (B) glyoxal, and (C) MGO in PDF (pH 7.5, 4.25% glucose; control) and the same fluid spiked with different metal cations. The diagrams show non-significant differences. Mean values  $\pm$  standard deviations of triplicates are displayed. The dashed line shows the GDP level of the control fluid. A two-tailed, paired t-test was calculated to show differences between the control and the spiked PDFs.

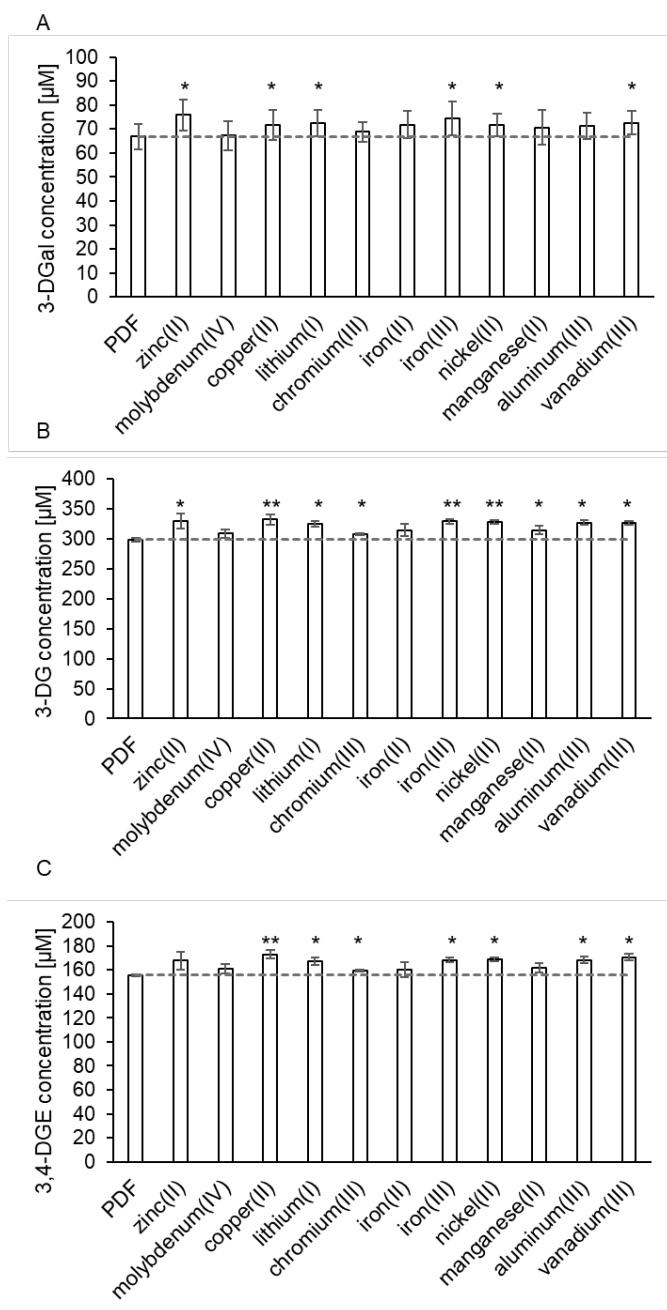


**Fig. S6** Concentration of (A) 3-DGal, (B) 3-DG, and (C) 3,4-DGE in PDF (pH 7.5, 4.25% glucose; control) and the same fluid spiked with different metal cations. Mean values  $\pm$  standard deviations of triplicates are displayed. A two-tailed, paired t-test was calculated to show differences between the samples and the control at pH 7.5 (\*  $p < 0.05$ , \*\*  $p < 0.01$ ). The dashed line shows the GDP level of the control fluid.