

Grape Antioxidant Dietary Fibre Induces Anti-Proliferative Response in Healthy Colon via Cell Cycle Arrest

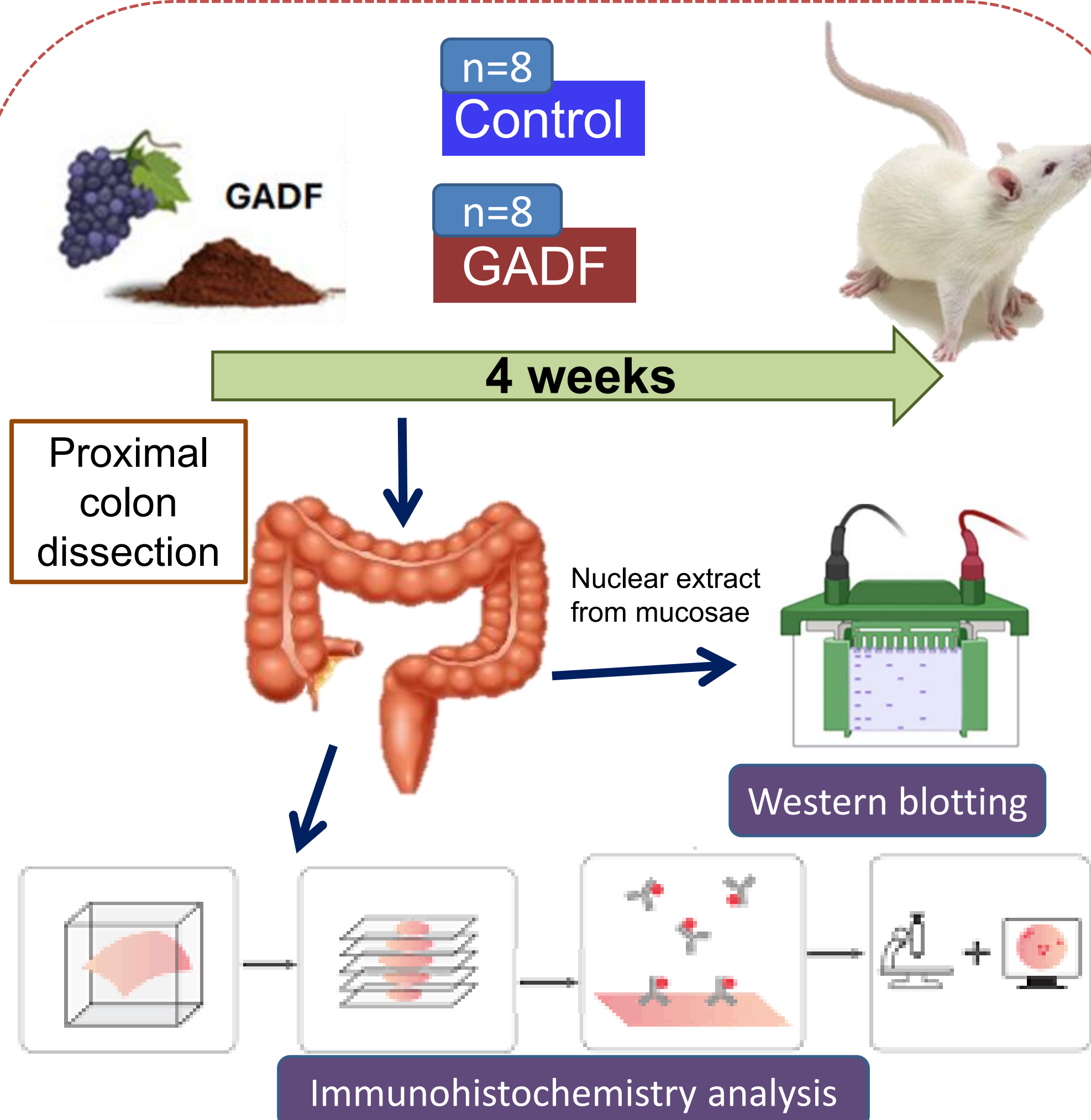
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INTRODUCTION & AIM

- Dietary bioactive compounds are increasingly recognized for their role in regulating epithelial homeostasis and preventing abnormal cell proliferation.
- Grape Antioxidant Dietary Fiber (GADF) is a natural product that combines high amounts of dietary fiber and phenolic antioxidants obtained through a patented process from red grape pulp (*Vitis vinifera*, var. *Cencibel*). Previous studies have highlighted that GADF reduced mucosal apoptosis in healthy rats by modulating antioxidant enzyme systems and shifting the glutathione redox balance toward a pro-reducing environment.
- In this study, we investigated the effect of GADF on the proliferation of proximal colonic mucosal epithelium in healthy rats.

METHODS



Approved by the Animal Care Committee of UCM (EU Directive 86/609/EEC). Results are expressed as mean±SD; Statistical analysis was performed using Student's t-test ($p < 0.05$)

RESULTS & DISCUSSION

Figure 1: GADF decreased PCNA-positive cells in Lieberkühn's crypts (-30.71%, $p < 0.0001$).

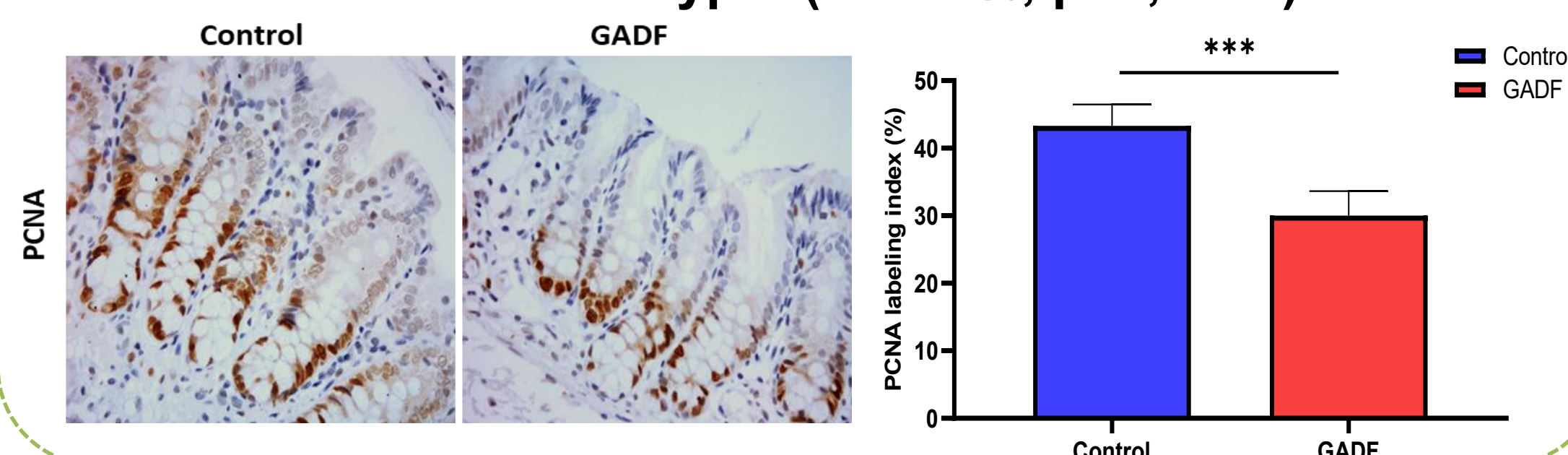


Figure 2: GADF induced the nuclear and cytoplasmic phosphorylation of p53 at Ser392 (+2306,7%, $p < 0.0001$).

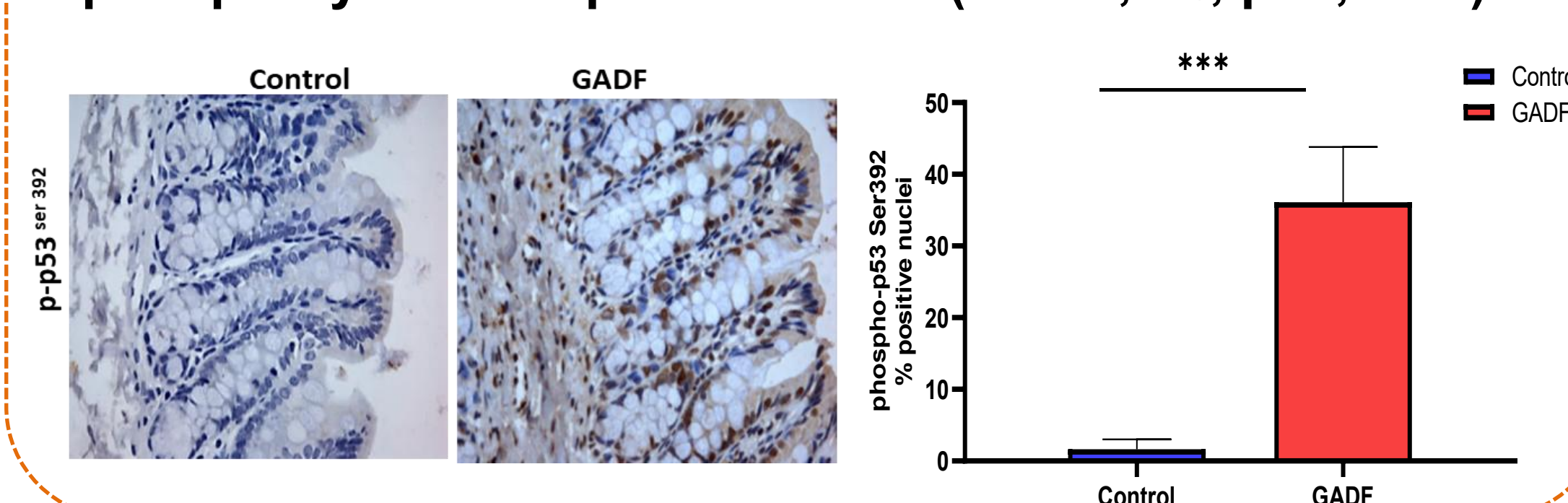
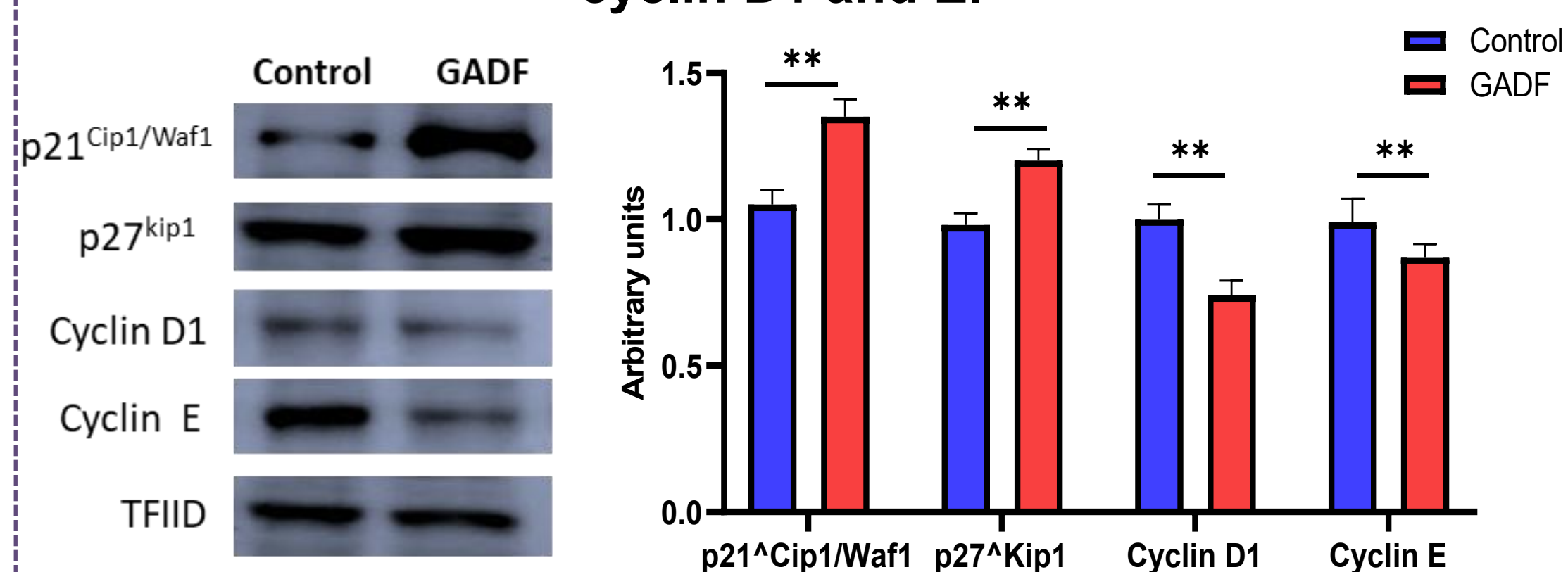


Figure 3: Cell cycle arrest was confirmed by increased levels of p21^{Cip1/Waf1} and p27^{Kip1}, and decreased cyclin D1 and E.



- GADF upregulated the expression of the cyclin-dependent kinase inhibitors p21^{Cip1/Waf1} and p27^{Kip1} by 35% and 20% ($p < 0.001$), respectively.
- GADF downregulated cyclin D1 and cyclin E by 26% and 17% ($p < 0.01$), respectively.

CONCLUSION

GADF induces a p53-dependent G1/S cell cycle arrest, limiting epithelial proliferation and supporting its potential as a chemopreventive dietary component against early colorectal cancer risk factors.

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