



# Reduction of Apoptosis by Metformin in X-Ray-Irradiated Human Skin: A TUNEL Assay Study

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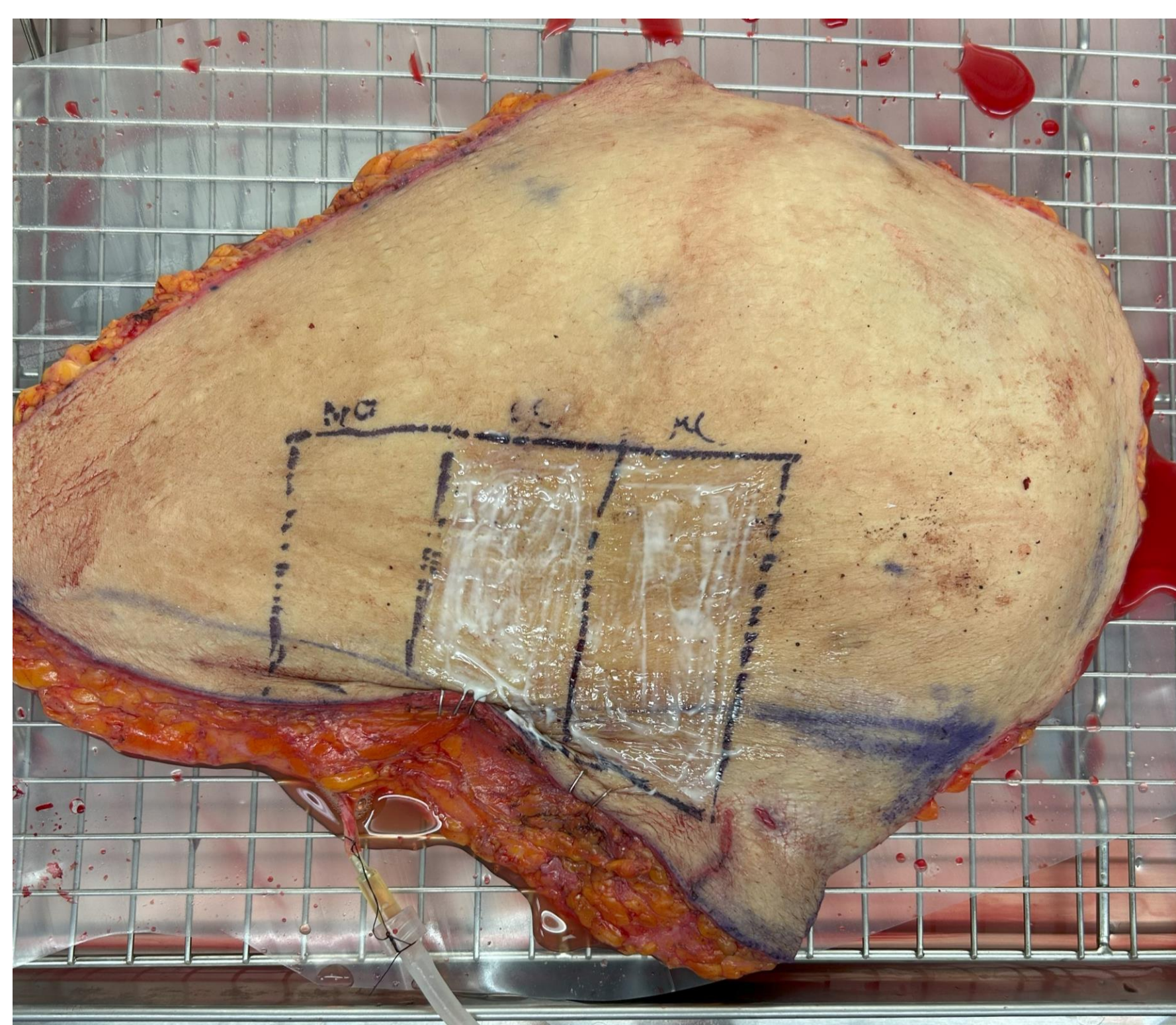


## INTRODUCTION

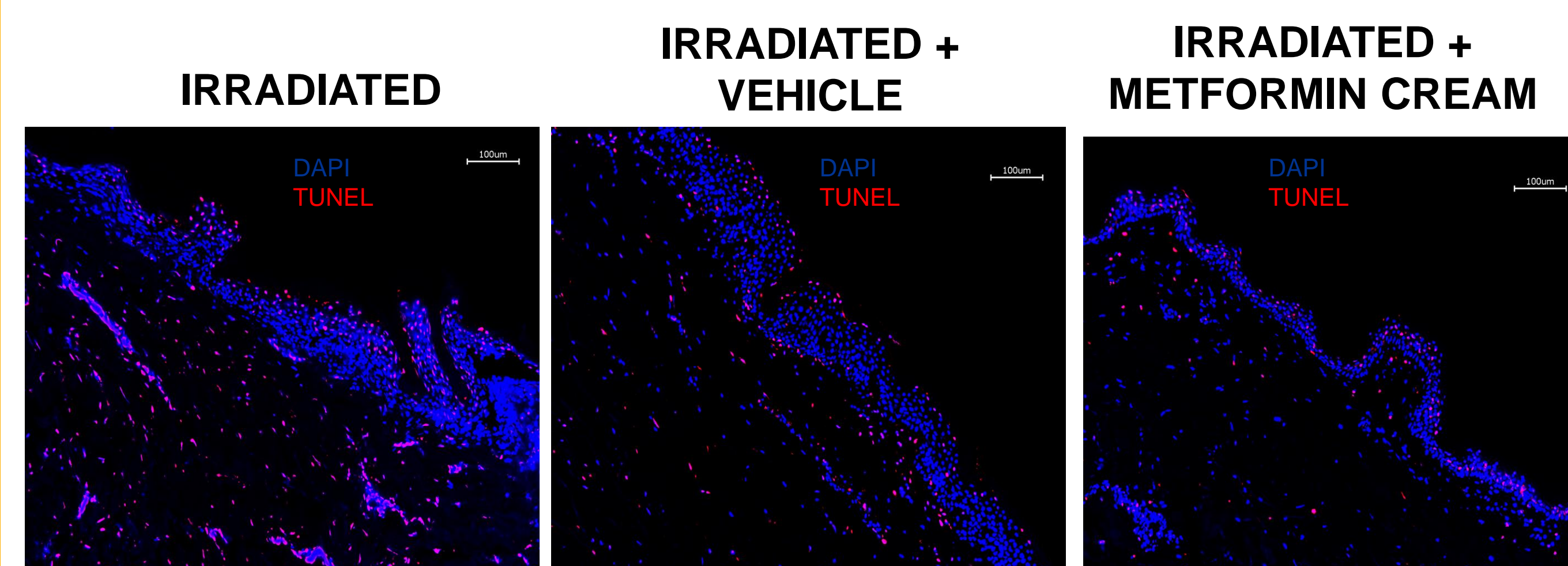
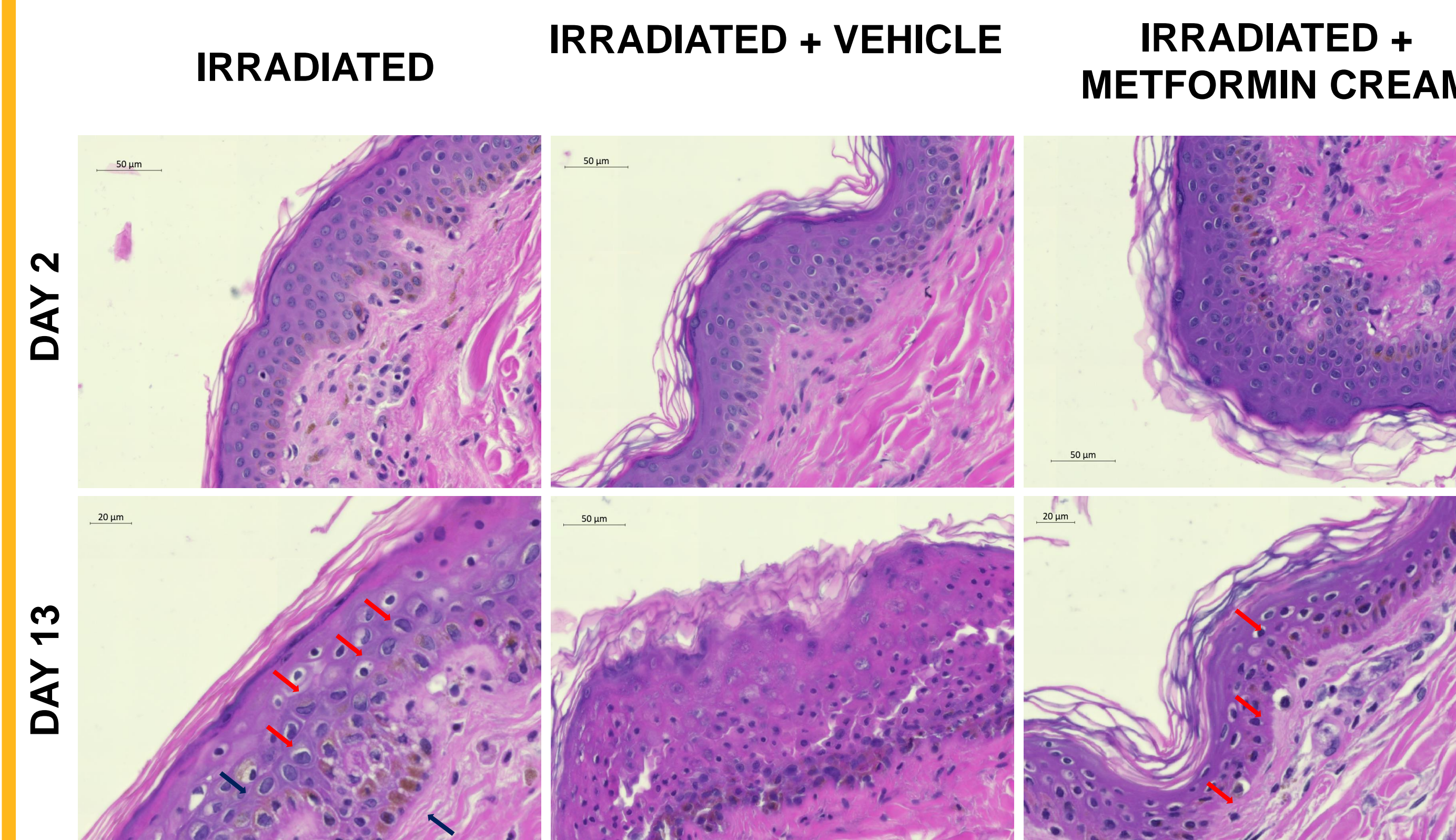
Apoptosis is a critical process in the cellular response to radiation exposure, and excessive apoptosis can lead to tissue damage and impaired healing. Following X-ray irradiation, human skin cells undergo significant apoptotic cell death, contributing to radiation-induced skin injury. Metformin, a well-known anti-diabetic drug, has shown potential in modulating apoptotic pathways. This study explores how Metformin can reduce apoptosis in X-ray-irradiated human skin, providing insights into its protective effects and its potential as a therapeutic strategy to mitigate radiation-induced cellular damage and promote skin repair.

## MATERIALS & METHODS

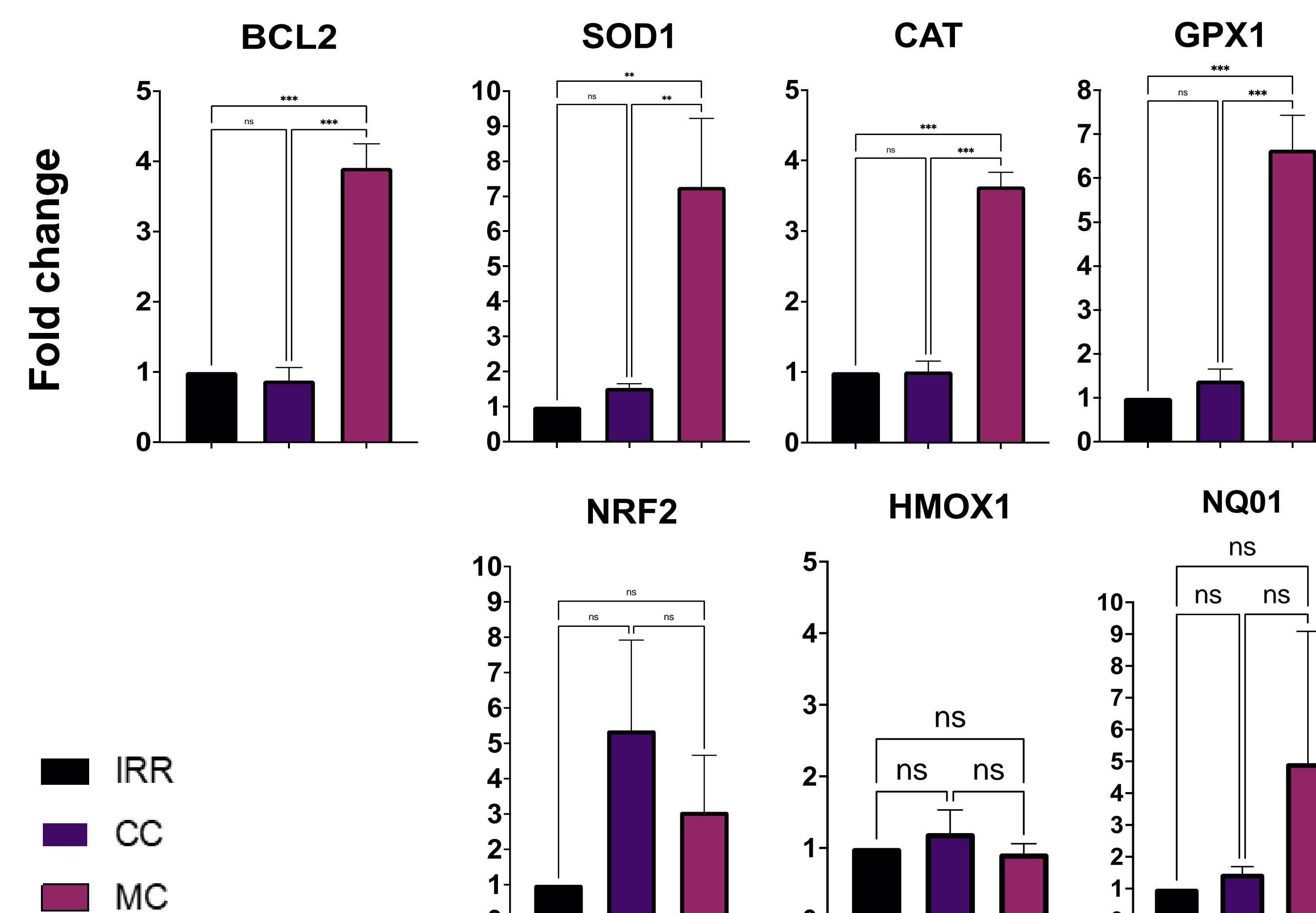
In this study, we investigated the effects of Metformin on apoptosis in human skin following X-ray irradiation using the TUNEL assay. Skin flaps, maintained on an ex vivo perfusion system, were exposed to 10 Gy of X-ray radiation and divided into three groups: irradiation only, irradiation with a control cream, and irradiation with Metformin cream. Biopsies were collected at days 2, 7, 11, and 13 post-irradiation. Apoptosis was assessed by performing the TUNEL assay on tissue sections to detect DNA fragmentation, a hallmark of apoptotic cell death. The results provide insights into the potential of Metformin in reducing radiation-induced apoptosis in skin cells.



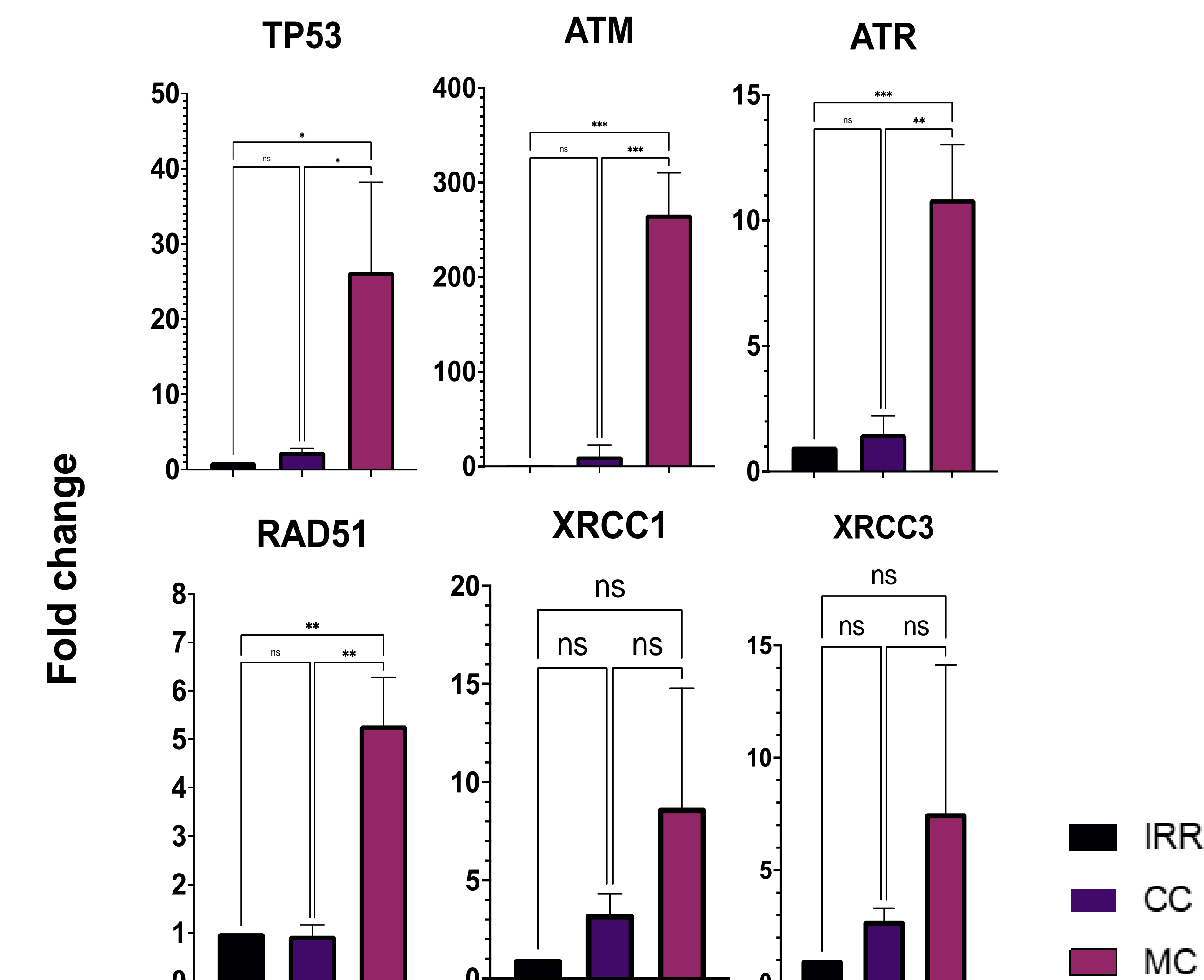
## RESULTS



### Apoptosis regulation



### DNA repair



## CONCLUSIONS

- Metformin shows promising potential as a topical therapeutic agent for reducing radiation-induced apoptosis in human skin.
- By mitigating apoptotic cell death, Metformin helps preserve skin cell viability and integrity following X-ray irradiation. This protective effect may contribute to improved skin healing and reduced radiation-induced tissue damage.
- These findings suggest that Metformin could be an effective strategy for protecting skin cells from radiation-induced apoptosis, particularly in clinical settings such as radiotherapy or in cases of accidental radiation exposure.
- Further research could explore Metformin's role in enhancing skin repair and minimizing radiation-related complications.

Topical Metformin offers a promising therapeutic approach for reducing radiation-induced apoptosis and preserving skin integrity, with significant potential for use in both clinical and accidental radiation exposure situations.