



Plumbagin decreased cadmium-induced IL-6 release from MDA-MB-231 cells



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Introduction

Cadmium is known to promote proliferation (1) and invasion of breast cancer cells (2) and induce the secretion of interleukin-6 in human glioblastoma U-87 MG, bronchial epithelial (HBE) Calu-3 and monocytic THP-1 cell lines (3-5).

Elevated serum IL-6 level is associated with tumor progression of breast (6) and ovarian cancers (7).

Plumbagin at 8 μM decreased CCL2 levels in MDA-MB-231, a triple negative breast cancer cell line (8).

Hypothesis

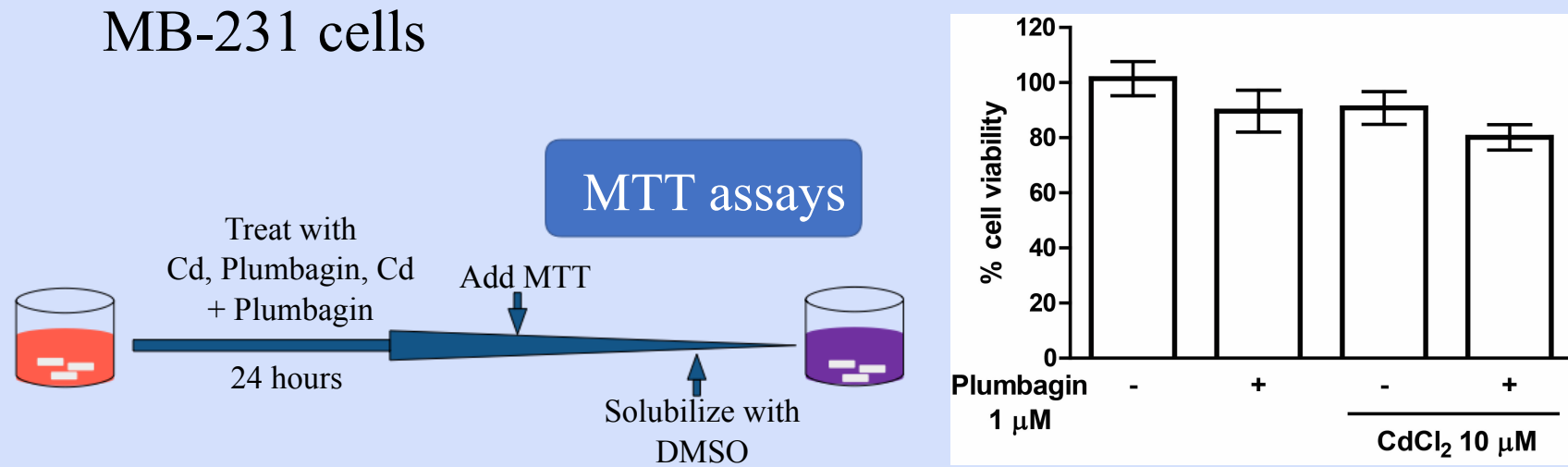
We hypothesized that plumbagin could reduce cadmium-induced IL-6 production in MDA-MB-231, a triple-negative breast cancer cell line.

Objective

To determine the effect of plumbagin on cadmium-induced IL-6 expression in a triple-negative breast cancer cell line, MDA-MB-231.

Methods and Results

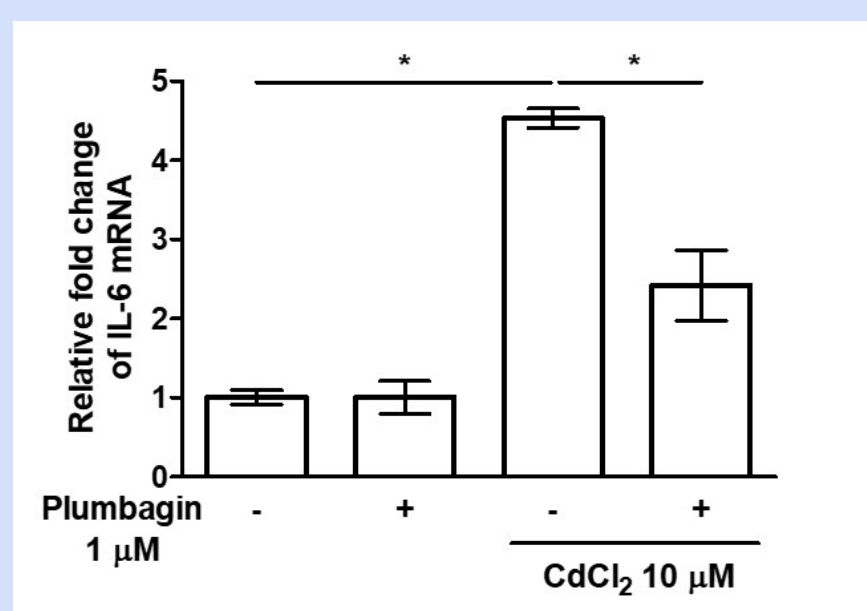
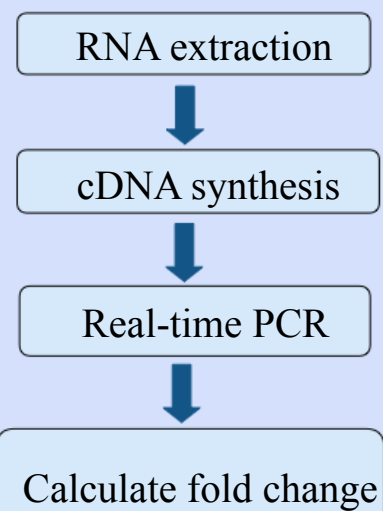
Effects of cadmium and plumbagin on cell viability of MDA-MB-231 cells



Cadmium 10 μM , plumbagin at 1 μM and cadmium plus plumbagin did not reduce cell viability.

2. Effects of cadmium and plumbagin on mRNA levels of IL-6 of MDA-MB-231 cells

Real-time PCR assays

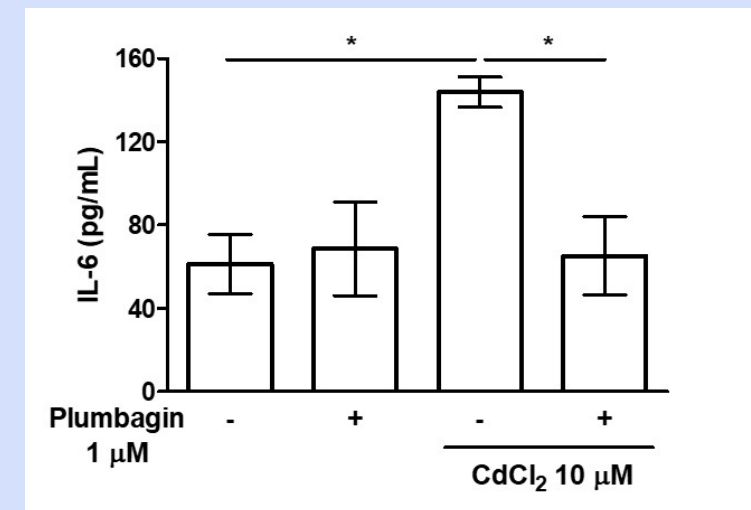
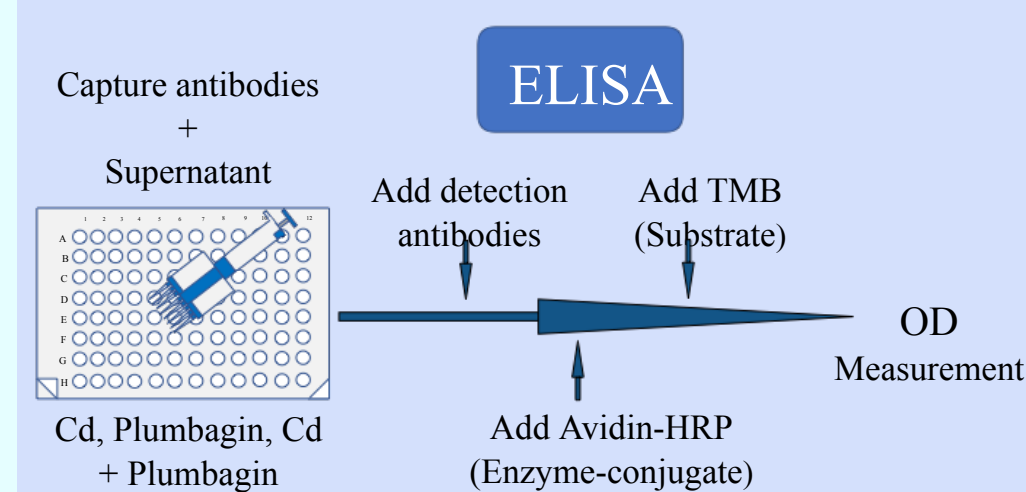


Cadmium at 10 μM increased IL-6 mRNA expression significantly

At 3 hours, plumbagin decreased cadmium-induced IL-6 mRNA levels by 46.6%

Methods and Results (Continues)

3. Effects of cadmium and plumbagin on IL-6 release from MDA-MB-231 cells



Plumbagin at 1 μM decreased cadmium-induced IL-6 levels by 54.65%.

Discussion and Conclusion

Plumbagin inhibits cadmium-induced IL-6 in MDA-MB-231 triple negative breast cancer cells, suggesting that the plumbagin could be beneficial as an alternative/adjunctive anticancer agent for the treatment of triple-negative breast cancers.

References

- Brama M, Gnessi L, Basciani S, Cerulli N, Politi L, Spera G, et al. Cadmium induces mitogenic signaling in breast cancer cell by an ERalpha-dependent mechanism. *Mol Cell Endocrinol.* 2007;264(1-2):102-8.
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- Phuagkhaopong S, Ospondant D, Kasemsuk T, Sibmooh N, Soodvilai S, Power C, et al. Cadmium-induced IL-6 and IL-8 expression and release from astrocytes are mediated by MAPK and NF-kappaB pathways. *Neurotoxicology.* 2017;60:82-91.
- Rennolds J, Malireddy S, Hassan F, Tridandapani S, Parinandi N, Boyaka PN, et al. Curcumin regulates airway epithelial cell cytokine responses to the pollutant cadmium. *Biochem Biophys Res Commun.* 2012;417(1):256-61.
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- Messeha SS, Zarmouh NO, Mendonca P, Alwagdani H, Kolta MG, Soliman KFA. The inhibitory effects of plumbagin on the NF-B pathway and CCL2 release in racially different triple-negative breast cancer cells. *PLoS One.* 2018;13(7):e0201116.

Acknowledgement

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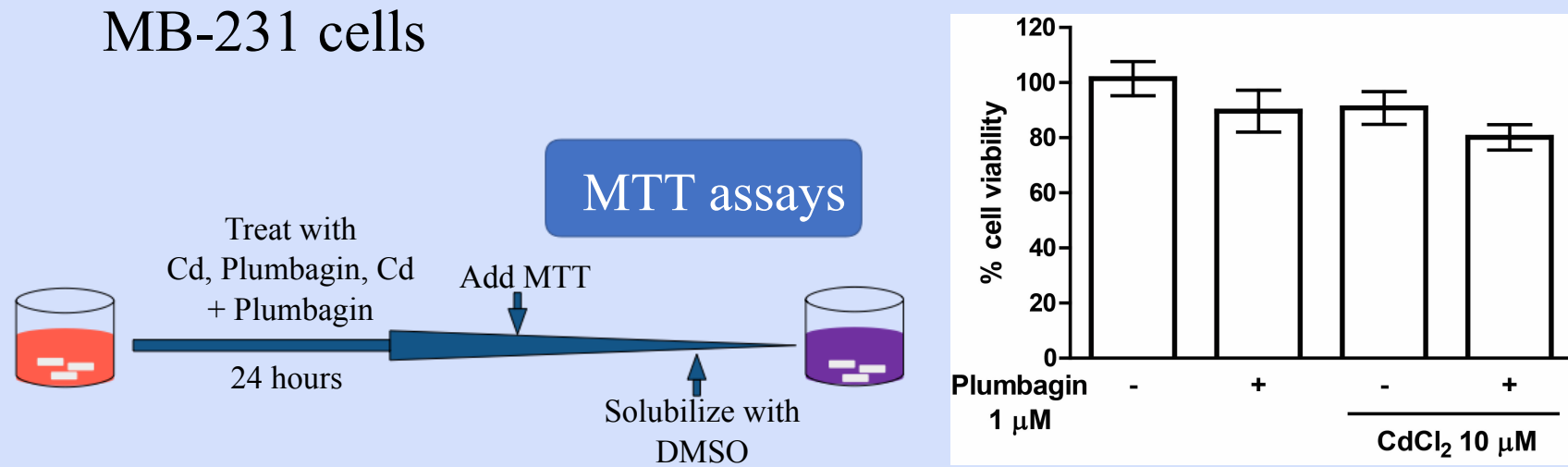
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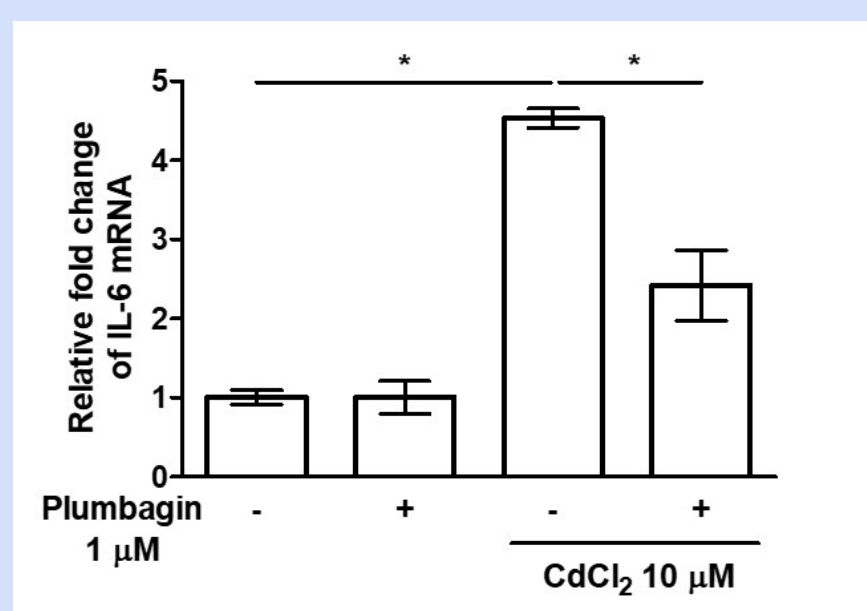
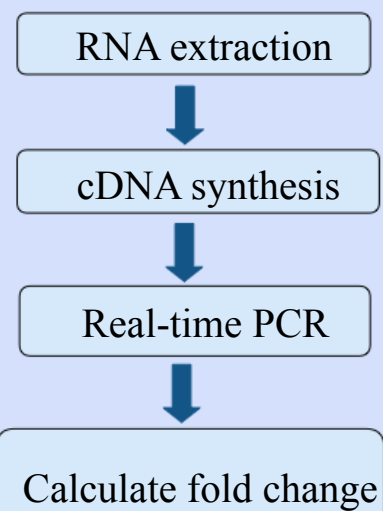
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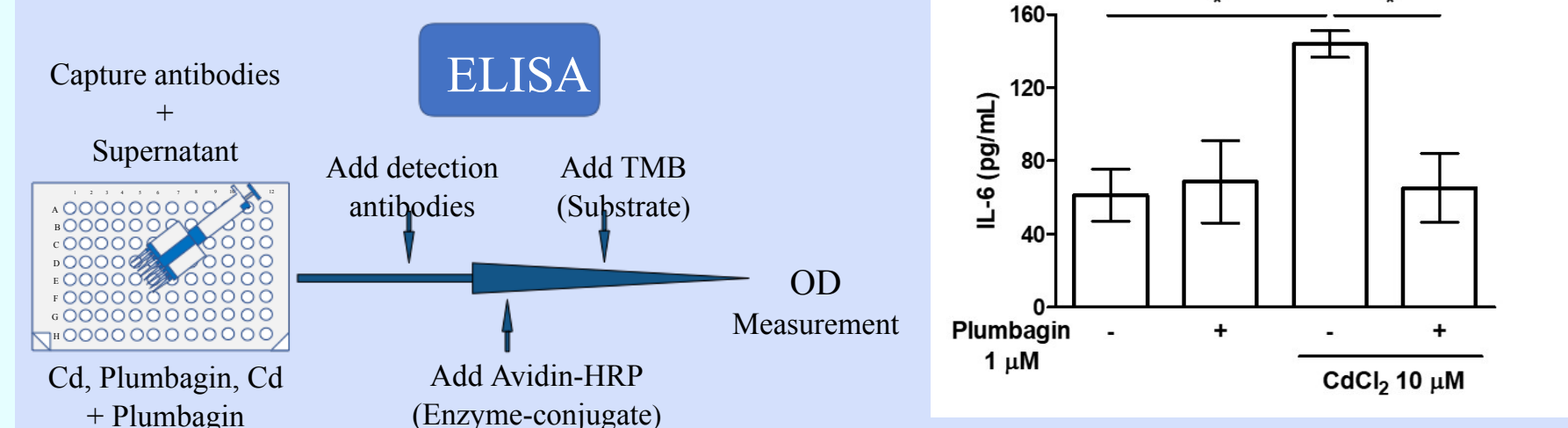


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