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## Testing the Efficacy and Synergistic Components of Sesamol and Black Rice Extract on Human Colon Cancer Cells

Sera Lim  
*Virginia Commonwealth University*

Philip M. Gerk  
*Virginia Commonwealth University School of Pharmacy*

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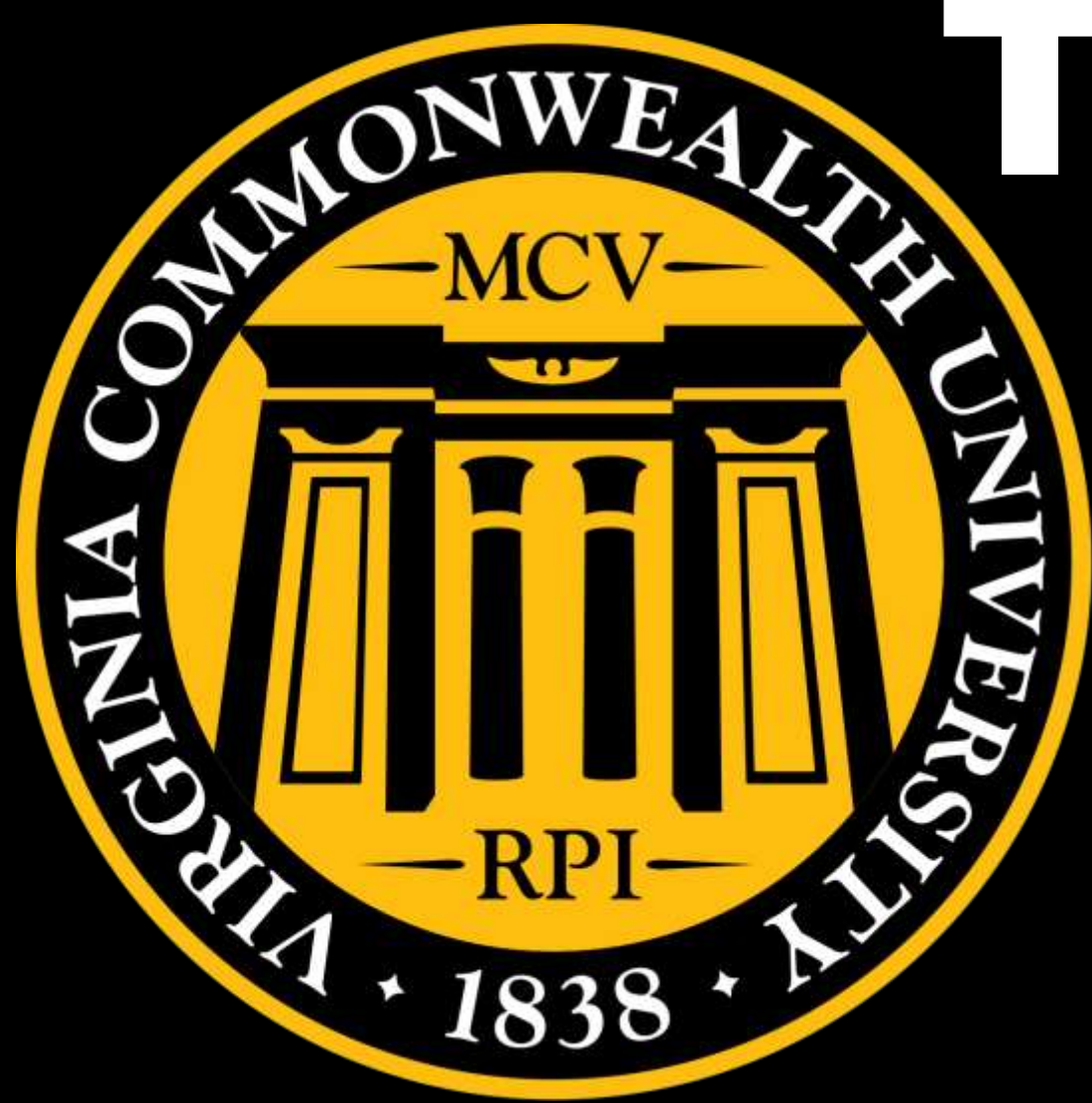
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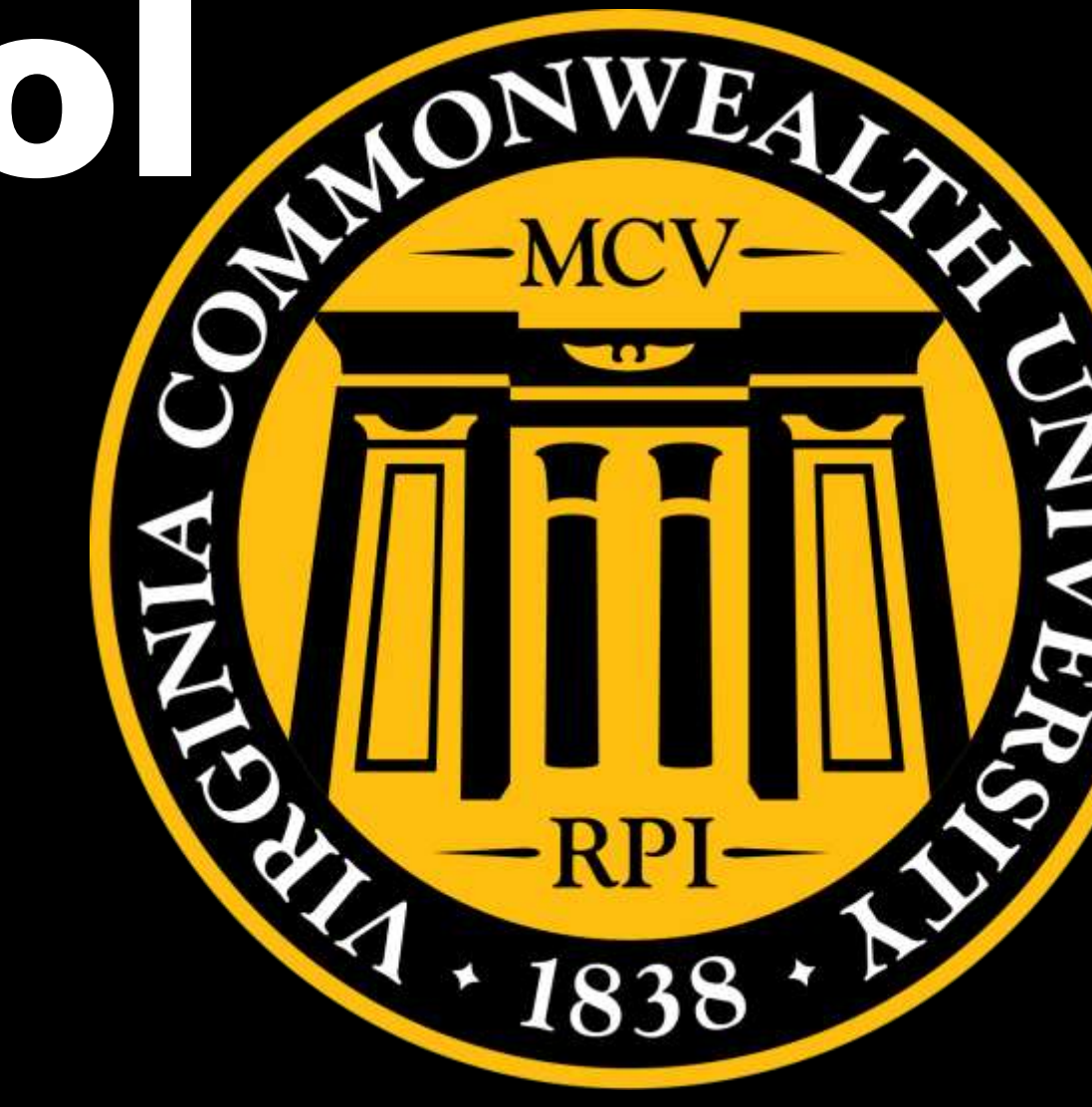
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# Testing the Efficacy and Synergistic Components of Sesamol and Black Rice Extract on Human Colon Cancer Cells



Sera Lim, Dr. Phillip M. Gerk

VCU School of Pharmacy, Department of Pharmaceutics

## Introduction

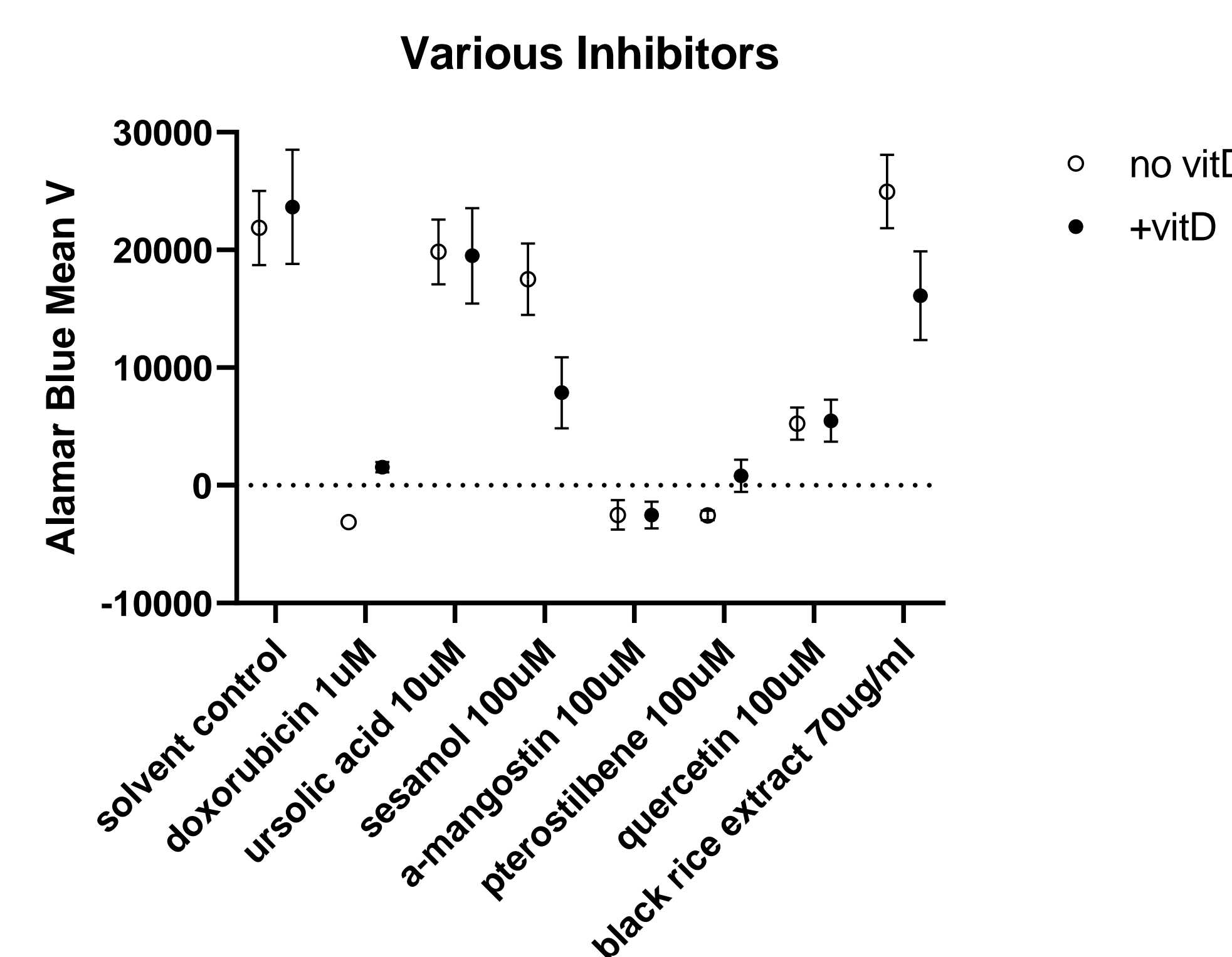
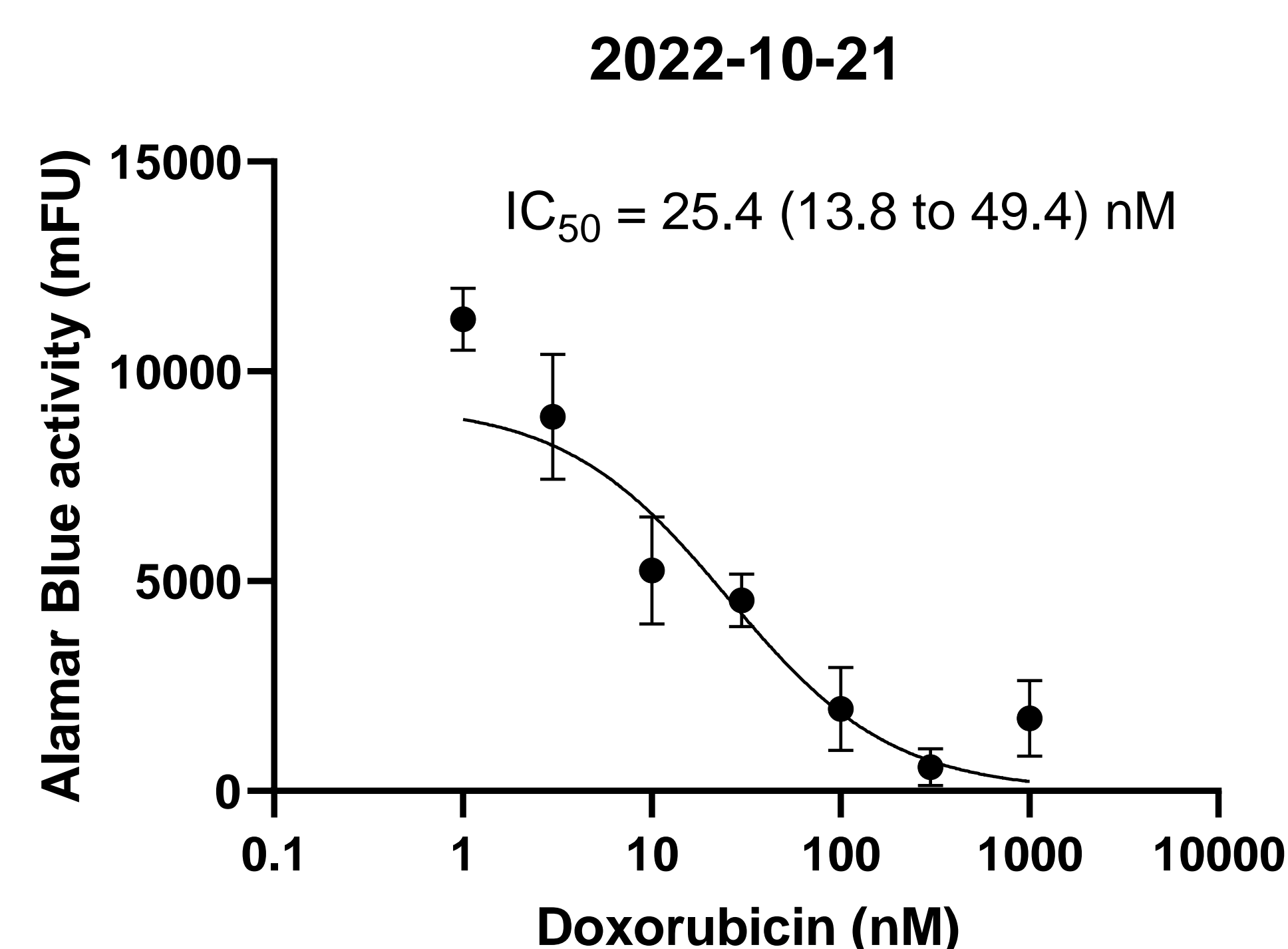
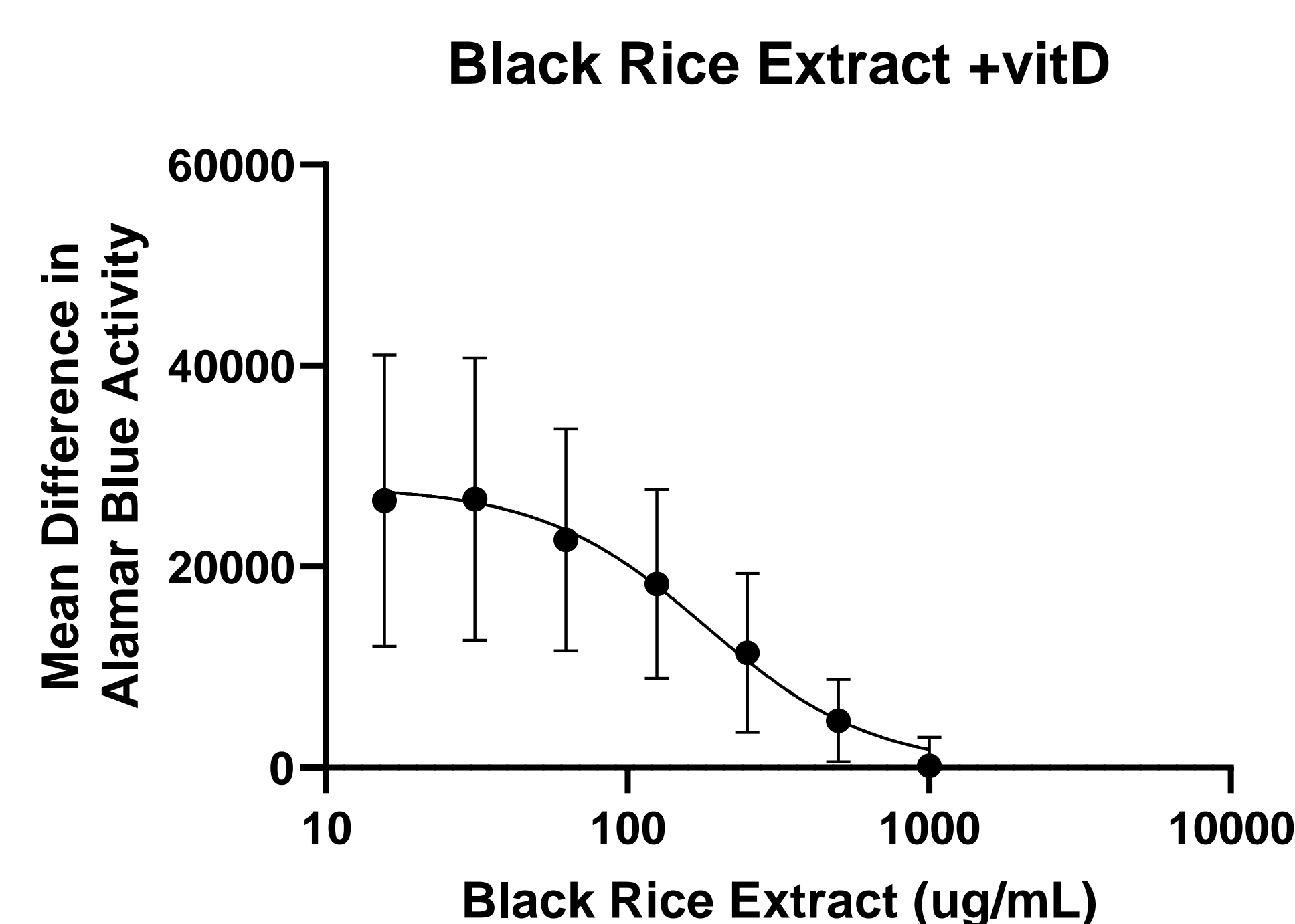
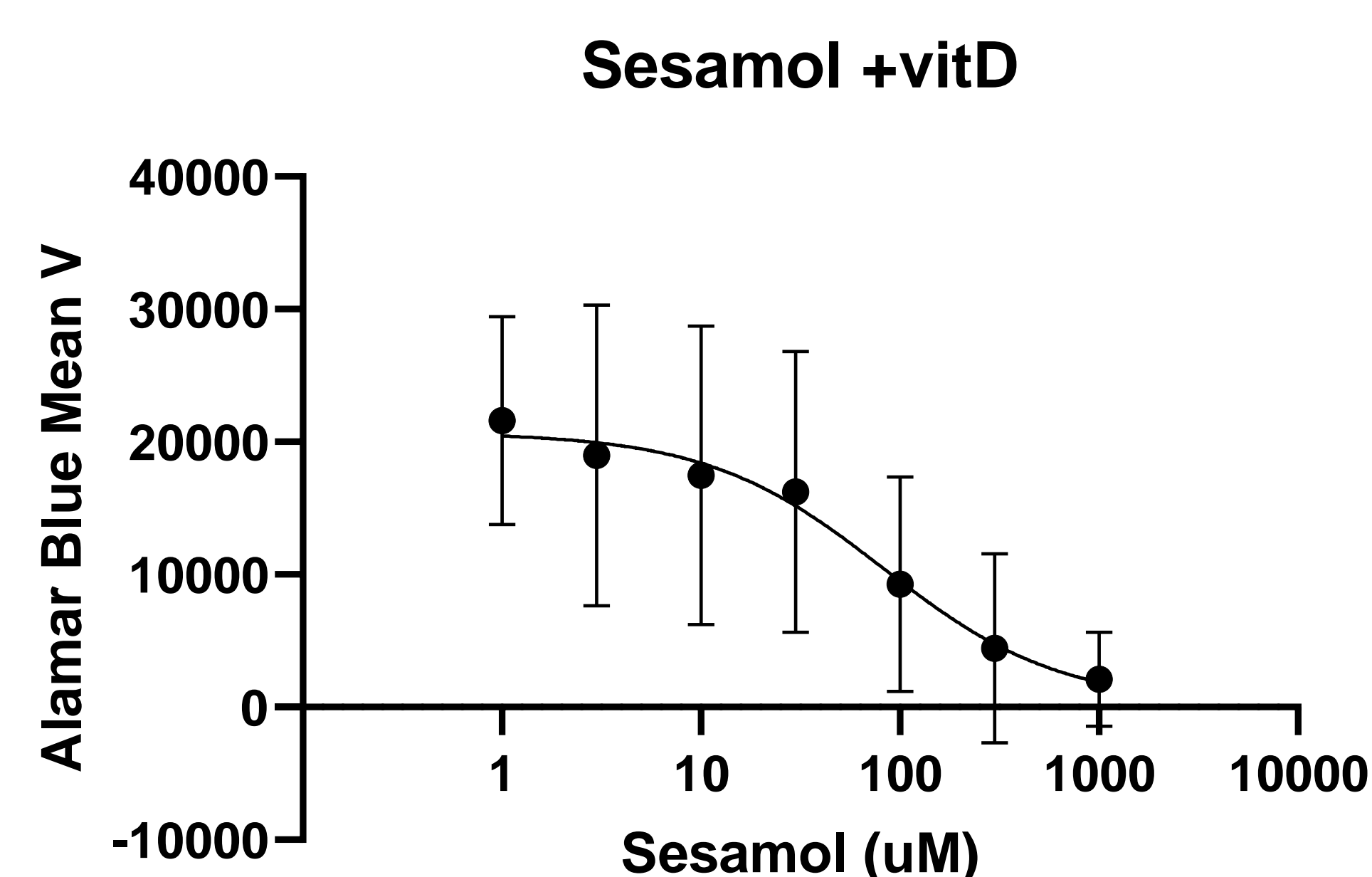
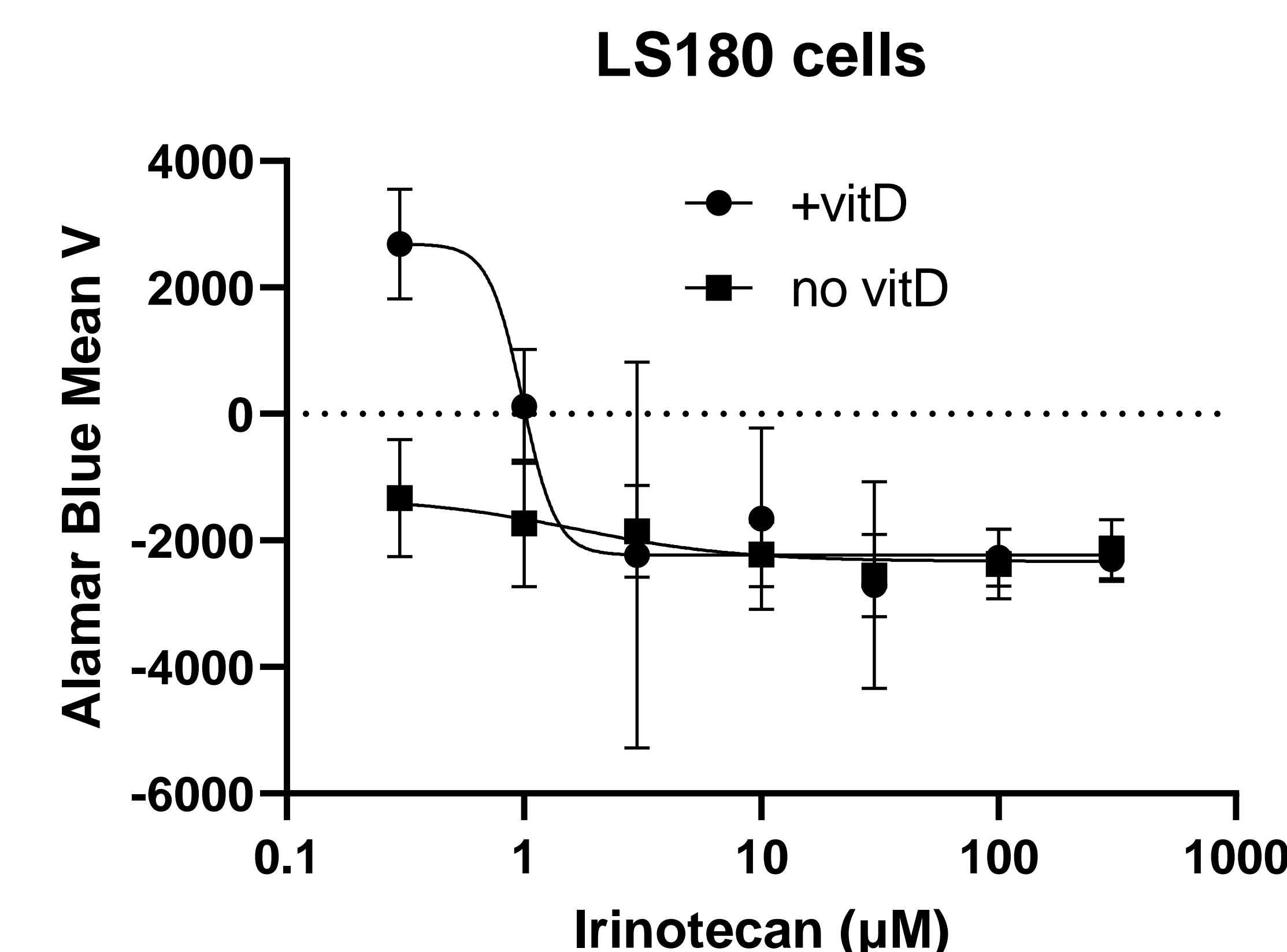
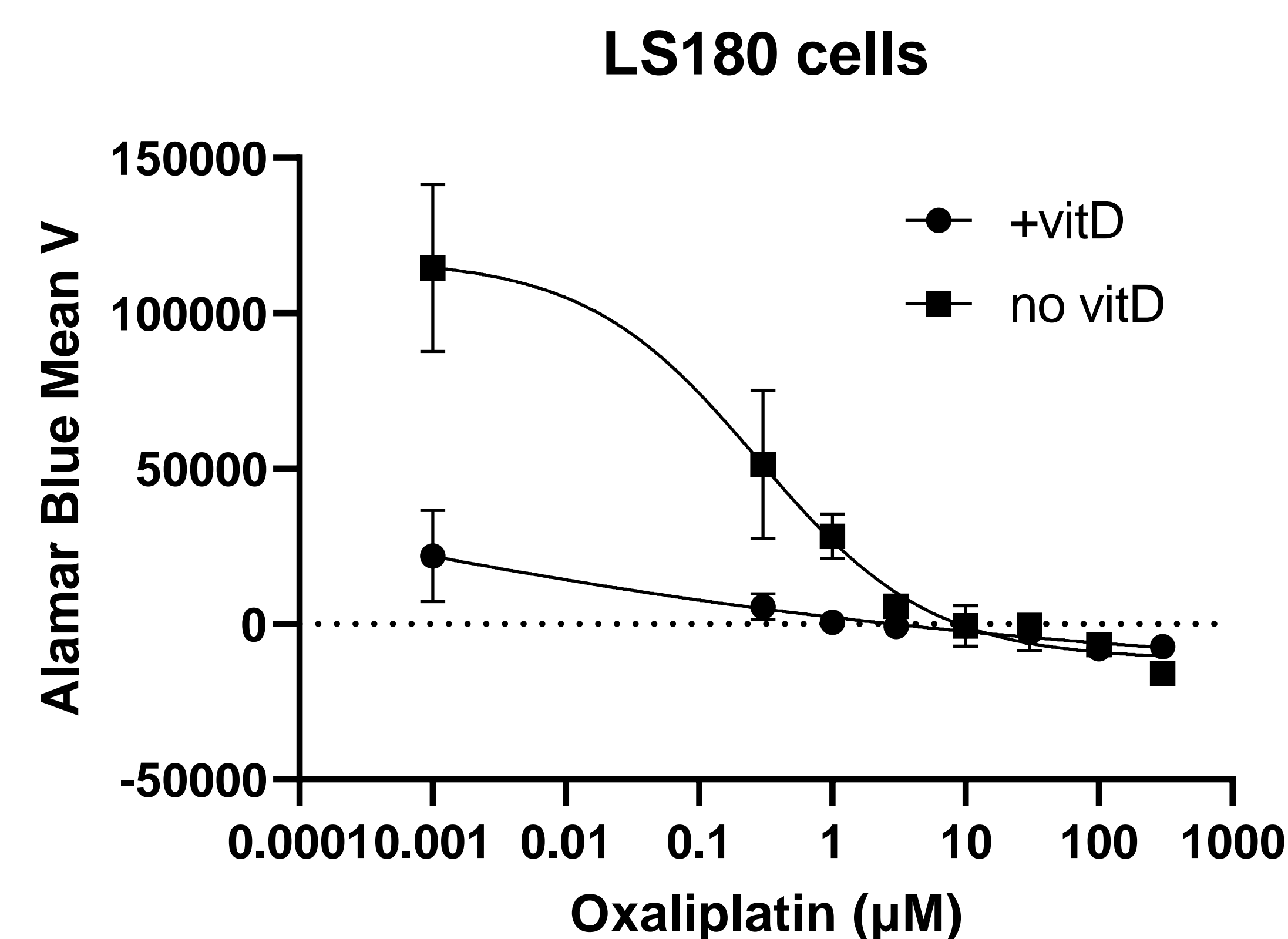
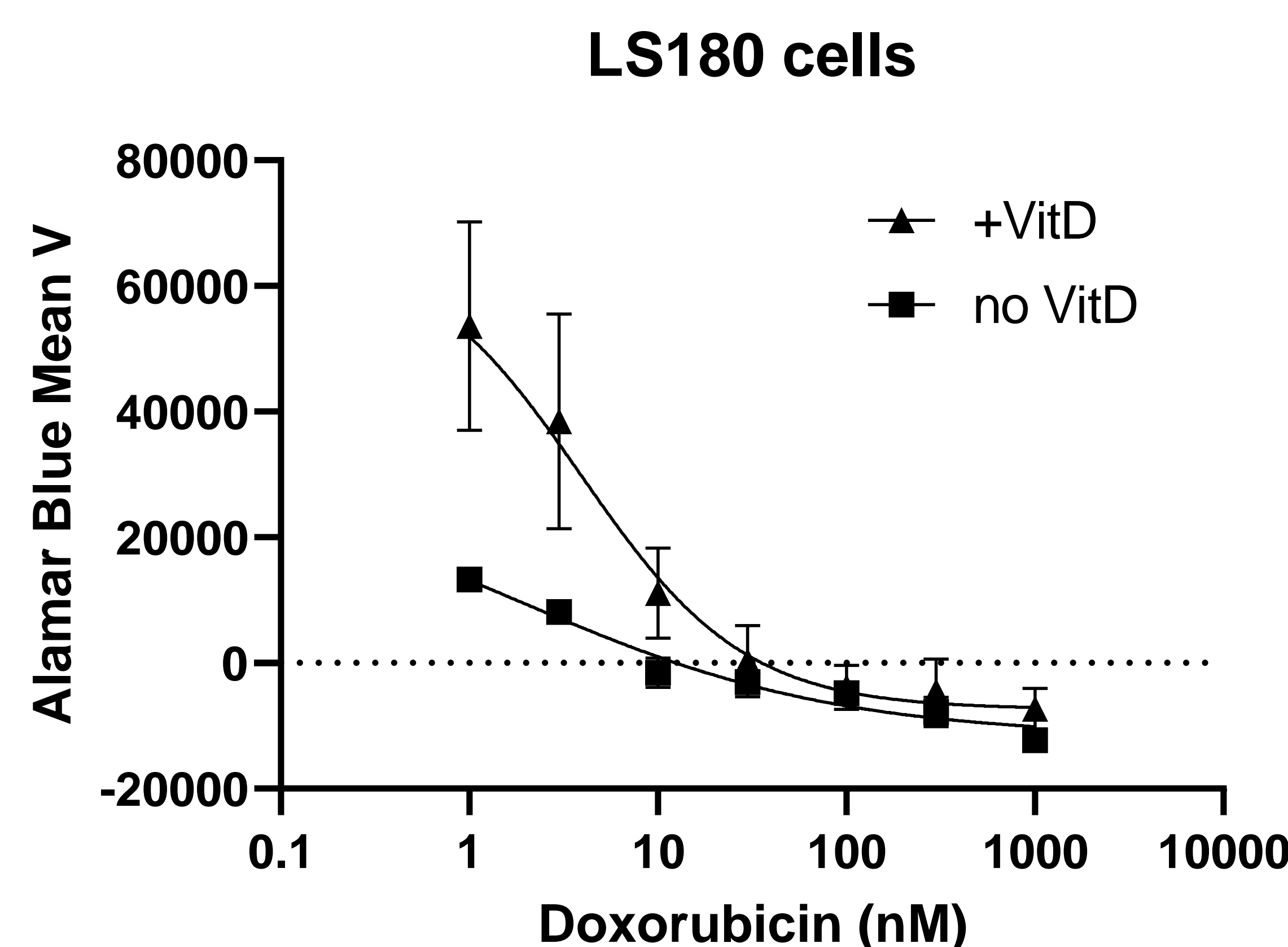
- Among the more than 1 million cancer patients receiving chemotherapy every year in the U.S., many them are diagnosed with colorectal cancer, the third most common cancer affecting both male and females [1, 2].
- Chemotherapy for colorectal cancer is a systemic treatment where chemotherapeutic agents circulate throughout the bloodstream, eliciting serious and negative side effects from the toxicity of the drug [3].
- In contrast, dietary supplements (specifically sesamol and black rice extract) exhibit anticancer, anti-inflammatory, and chemo-preventative properties [4, 5, 6].
- To combat this issue of chemotherapeutics leading to negative, systemic effects, we are testing dietary supplements for their efficacy against human colon cancer cell lines along with their potential synergistic effects when combined with conventional chemotherapy.
- This will help us understand and determine whether dietary supplements can act as potential chemo-enhancers, even in the presence of vitamin D induced drug-resistance mechanisms.

## Methodology

- LS180 and HT29 human colonic adenocarcinoma cells were cultured in 96-well plates in standard media lacking or containing active vitamin D (250nM).
- Treatments with varying concentrations of doxorubicin, oxaliplatin, irinotecan (chemotherapeutics), sesamol, and black rice extract (dietary supplements) were created (0, 0.1, 0.3, 1, 3, 10, 30, 100, 300, and 1000uM).
- Initial Alamar blue metabolic activity was measured by fluorimetry before treatment and after two-day incubation period.
- Final Alamar blue metabolic activity was measured by fluorimetry following the two-day treatment period.
- Growth rates were compared, and graphs were obtained using Prism Software.
- Each treatment concentration was run in quadruplicates, and the experiment was repeated three times for greater validity.

## Results

- In the presence of vitamin D, the tested substances showed decreased potency against cell proliferation.
- Vitamin D treatments accelerated cell proliferation and decreased the potency of doxorubicin (IC50 values: 1.9nM (alone), 3.9nM (vitamin D)).
- However, a large degree of variability obscured some of the results.



## Conclusion

Futures studies will find ways to decrease the variability and determine the extent to which sesamol and black rice extract enhance chemotherapy and overcome drug resistance mechanisms.

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