

An Exercise in Scientific Communication: Identification of Toxicities in Non-Small Cell Lung Cancer Chemotherapy and Antiretroviral Therapy Combinations

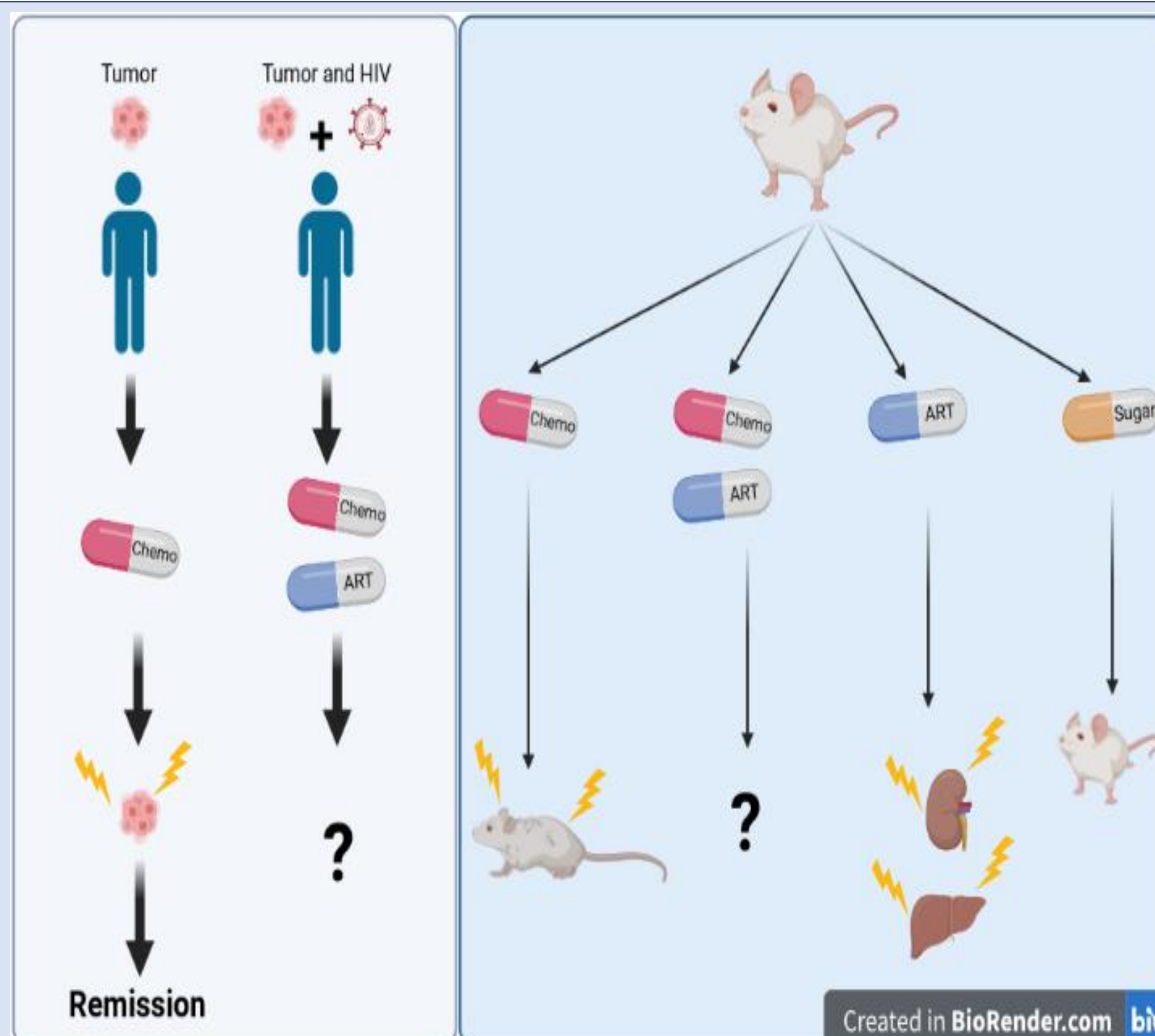
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Introduction

- Non-small cell lung cancers (NSCLCs) are the most abundant and most fatal cancer in people living with HIV (PLWH)
- systemic chemotherapies for NSCLC interact with many antiretroviral therapies (ARTs) for HIV to produce toxicities or reduce efficacy
- Preclinical and clinical trials are needed to determine safe combinations of these therapies
- Care for PLWH and cancer requires collaboration between many healthcare providers and family members with a range of scientific knowledge, so information must be accessible to non-scientists



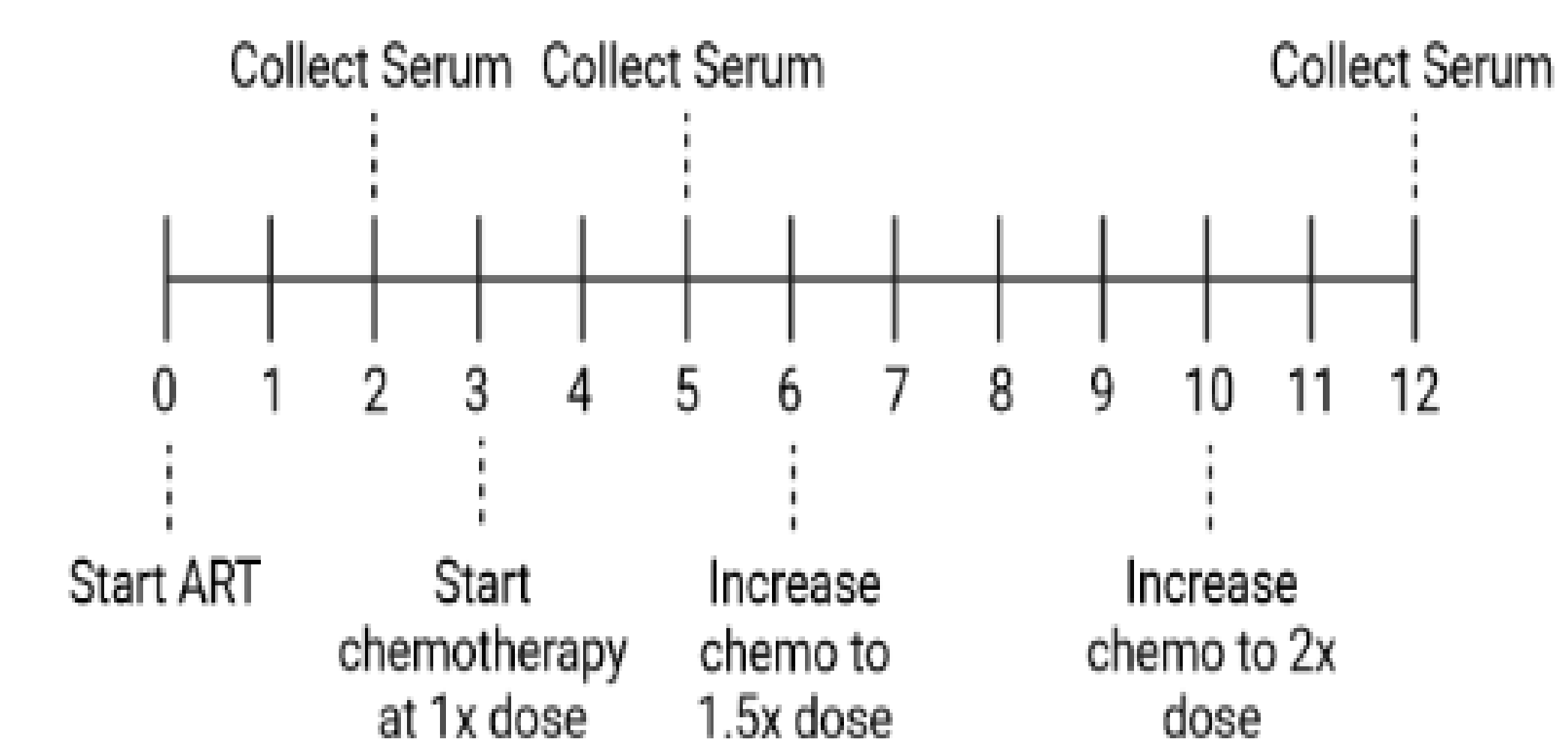
Aim

- Evaluate toxicities during concomitant NSCLC chemotherapy and conventional ART
- Identify strategies for scientific communication that facilitate material comprehension by non-scientific audiences

Methods

- Non-humanized NSG-Quad mice were divided into six groups of five mice (n=5). Two groups received ART (Truvada) alone in their water at a 7.4 g/L or 2.1 g/L concentration. Another two groups with similar ART dosing received chemotherapy (cisplatin and gemcitabine). The two final groups were used as controls and received either no treatment or chemotherapy alone.

Timeline of Experiment



Results

- Mice receiving chemotherapy and ART experienced decreases in body weight.** Furthermore, compared to non-chemotherapy groups, **mice receiving medium ART and chemo had significantly decreased body weight at weeks 11 and 12.** While chemo groups on either ART treatment trended lower than the chemo alone group, these discrepancies were not significant (Figure 1).
- Alkaline phosphatase (ALP), a hepatic function marker, was not significantly different when comparing chemo treated groups to chemo naïve groups. However, at week 2 and week 12, the medium ART group had significantly higher ALP than the control group (Figure 2).
- Three strategies to scientific writing could be utilized to improve communication to non-scientists. First, **context** can promote understanding of a study's rationale and significance. Second, **clear figures** can simplify complex procedures. Third, **explanations** that are written **concisely** and towards a **concrete** message are more effective.

Mass Analysis

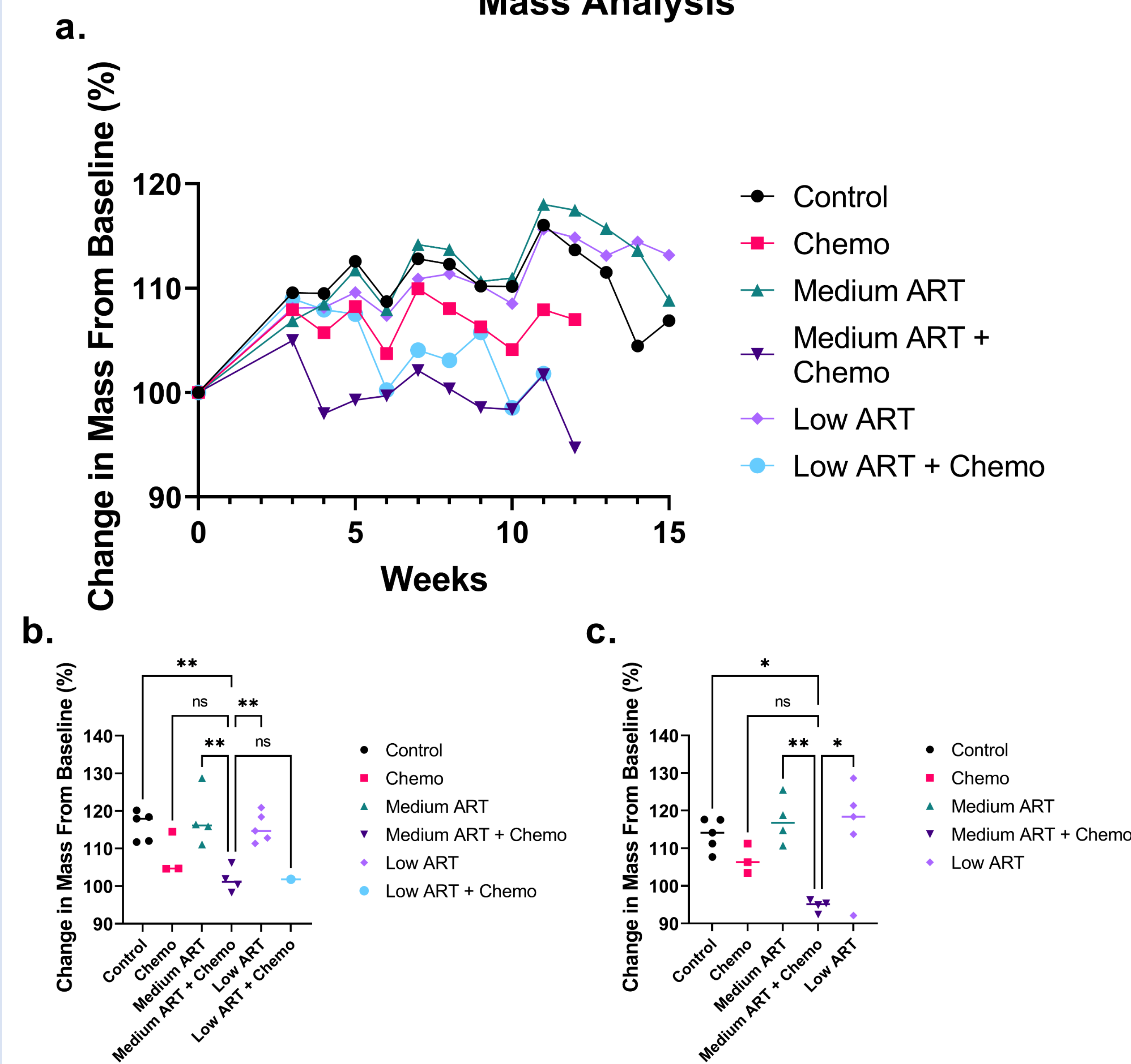


Figure 1. a. change in mouse mass from baseline in percent for each treatment. b. Week 11 and c. Week 12 analysis of change in mouse mass from baseline per treatment. Statistical significance was tested by ordinary one-way ANOVA. *, p<0.05; **, p<0.01

ALP Analysis

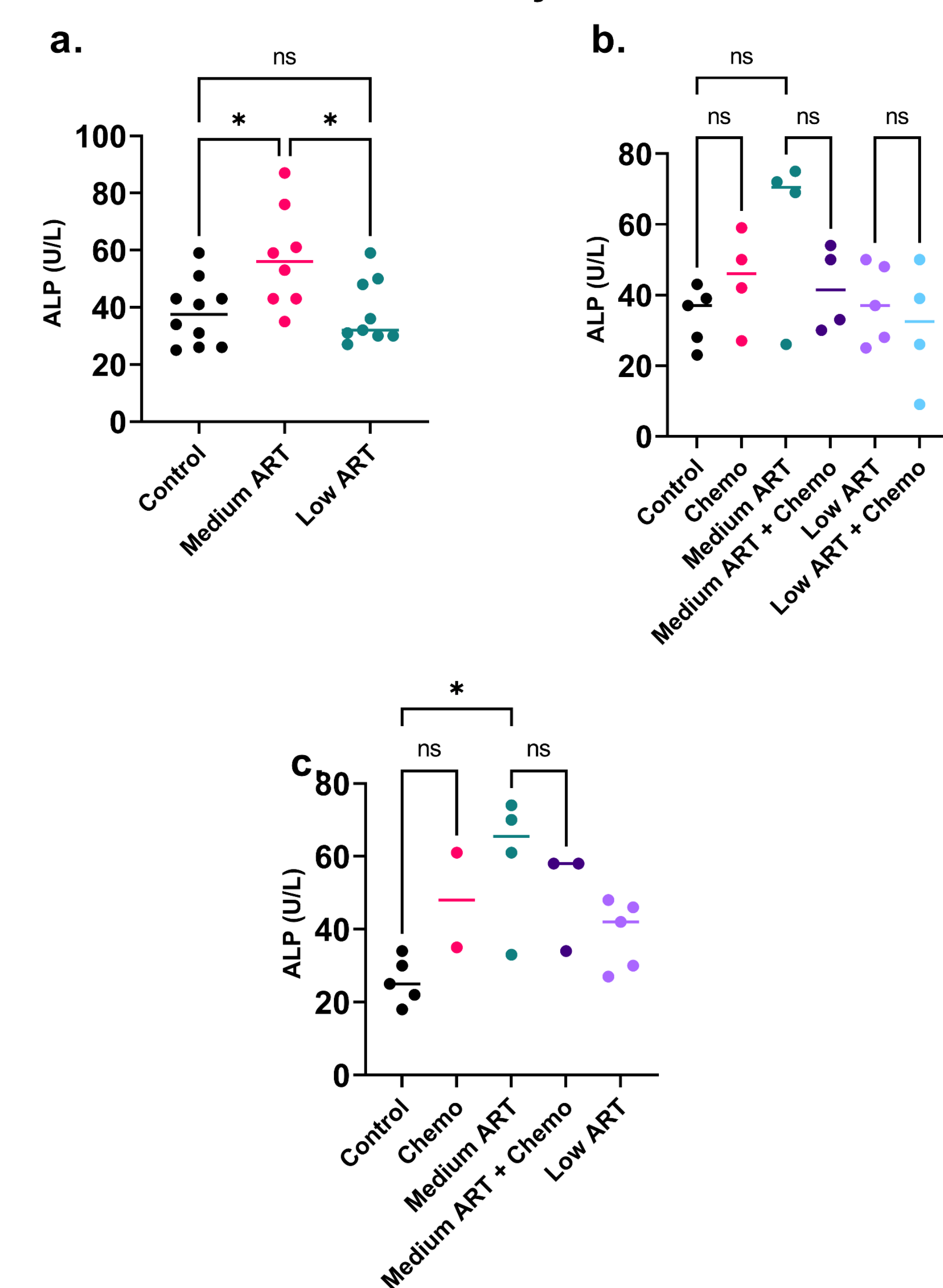


Figure 2. a. serum ALP (U/L) values per ART treatment at week 2 (before chemo). b. Week 5 ALP values per ART and chemo treatment. c. Week 12 ALP values per treatment. Statistical significance was tested by ordinary one-way ANOVA. *, p<0.05

Conclusions

- During concomitant NSCLC chemotherapy and ART, **chemotherapy has a larger influence than ART on general health**, such as body weight, but **there is trend evidence that the addition of ART exacerbates these effects.**
- Truvada displayed dose-dependent hepatic toxicity that is not significantly affected by concomitant NSCLC chemotherapy.** Furthermore, NSCLC chemotherapy, alone, showed no hepato-specific toxicity.
- The proposed communication strategies clarify concepts by providing precise explanations in multiple formats that are accompanied by background and definitions. The efficacy of these strategies in non-scientist populations will be studied as the next step in developing scientific communication resources.

Acknowledgments

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