

Poster 08 Repurposing the antimalarial drug Artesunate for cancer treatment

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The anti-malaria drug Artesunate (ART) shows strong anti-cancer effects in vitro; however, it shows only marginal treatment results in clinical cancer studies. In this study, ART was tested in preclinical 3D cancer models of increasing complexity using clinically relevant peak plasma concentrations to obtain further information for translation into clinical use. ART reduced cell viability in HCT-116 and HT-29 derived cancer spheroids ($p < 0.001$). HCT-116 spheroids responded dose-dependently, while HT-29 spheroids were affected more strongly by ART than by cytostatics ($p < 0.001$). HCT-116 spheroids were chemo-sensitized by ART ($p < 0.001$). In patient-derived cancer spheroids (PDCS), ART led to inhibition of cell viability in 84.62% of the 39 samples tested, with a mean inhibitory effect of 13.87%. Viability reduction of ART was 2-fold weaker than cytostatic monotherapies ($p = 0.028$). Meanwhile, tumor-stimulation of up to 16.30% was observed in six (15.38%) PDCS samples. In 15 PDCS samples, ART modulated chemotherapies in combined testing, eight of which showed chemo-stimulation (maximum of 36.90%) and seven chemo-inhibition (up to 16.95%). These results demonstrate that ART's anti-cancer efficacy depends on the complexity of the tumor model used. This emphasizes that cancer treatment with ART should be evaluated before treatment of the individual patient to ensure its benefits and prevent unwanted effects.