Introduction
Patient samples give limited amounts of cells for in vitro drug sensitivity assays. Yet it is desirable to obtain information on concentration-response relationship in the individual tumor as such estimates may be of value of predicting clinical response to drug therapy.

Objectives
1. To develop a population PD model for the in vitro drug sensitivity of leukemic cell samples from patients with acute myelocytic leukemia (AML) for cytosine arabinoside (AraC) and daunorubicin (Dnr).
2. To relate estimated individual in vitro parameters to clinical outcome.

Material and Methods
✓ Tumor cell samples from 179 patients with AML (nobs=1085).
✓ Fluorometric microculture cytotoxicity assay.
✓ I-5 concentrations of each drug was tested, ranging 0.02-12.5 µg/ml for AraC and 0.004-12.5 µg/ml for Dnr.
✓ Estimation method: FOCE in NONMEM V.
✓ Population PD model
  ✓ Model development was based on 124 patients (nobs=704).
  ✓ External evaluation was based on 30 patients (nobs=300).
✓ Probability of clinical outcome
  ✓ 46 patients treated with the AraC+Dnr combination.
  ✓ A logistic regression model.
  ✓ Estimated individual pharmacodynamic parameters from in vitro assay was used to predict clinical outcome.

Conclusions
✓ A joint pharmacodynamic model for AraC and Dnr including covariances across drugs, could adequately describe the in vitro sensitivity data.
✓ Drug potency could be obtained even with sparse sensitivity measurements.
✓ The model for clinical outcome is mechanistically reasonable and supports the dual therapy.