Infinite Science Publishing

# Pre- and intratherapeutic cellular monitoring for dose adjustment of chemotherapy in aggressive lymphoma

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**Keywords**: DNA double strand break, yH2AX, aggressive lymphoma, chemotherapy

**Purpose**: In eukaryotic cells treated with chemotherapeutic drugs DNA double strand breaks (DSB) are the most severe form of DNA damage which usually leads to apoptotic cell death. Cytotoxic chemotherapy is still a mainstay of cancer therapy, but there are few established methods to individually predict efficacy and tolerability. In most regimens dosage is based on the body surface area, a dimension of little biological precision, and individual dose adaptions are usually performed by clinical guessing or in response to adverse events. This project sets out to examine biological parameters of cell damage.

**Methods**: In particular, we measure DNA double strand breaks by an automated yH2AX assay applying the Aklides NUK® system. In preliminary work, PBMCs were stimulated with bendamustine or with rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone, the components of the R-CHOP protocol, to induce DSB.

**Results**: There was no inter-individual correlation between drug dose and number of foci, whereas does titrations on the cells of each individual donor demonstrated a clear correlation between dose and yH2AX assay result.

**Conclusion**: The lack of correlation across individuals between yH2AX foci and drug dosage based on standard calculation by body surface area suggests that standardized dosing of chemotherapeutic drugs based on gross physical determinants such as weight or body surface area does not correspond to the individual's biological response and clinical effect. The future plan of this project is the replacement of standard dosage regimens by biologically based, real-time-adapted individual dosage in lymphoma to reduce toxicity while increasing therapeutic efficacy.