

TITLE

SECURE CYTOTOXIC ADMINISTRATION BY NON-INVASIVE SPECTROSCOPY

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ABSTRACT

Chemotherapy treatments are individually adapted by physicians to each cancer patient. The stability of the diluted cytotoxic formulations is limited. Therefore, treatments are most often prepared a short time before administration.

Even if pharmaceutical regulations do not require a final analytical control of each individualized cytotoxic preparation, specific control has been developed for safety, to ensure the use of the correct drug at the good concentration.

Preparation and administration are the most critical steps. Therefore, analysis of each preparation for each patient contributes to reduce medication errors and to avoid undesired consequences.

Considering the high number of cytotoxic preparations per day, the very short time between prescription, preparation and administration and the toxicity of these drugs (cancerogenic, mutagenic and teratogenic properties), noninvasive Raman and near infrared spectroscopies as easy-to-handle, fast and non-destructive techniques have been preferred to conventional methods.

Preliminary results obtained using prediction models, tested on four molecules, highlighted the feasibility and the necessity of automate the qualitative and quantitative control of these drugs. The goal of this project is to extend this approach to all cytotoxic drugs to develop universal prediction models able to identify and quantify chemotherapeutic agents from their NIR or Raman spectra before administration. And we wish to benefit from the interdisciplinary research aspect of the CDS.

In CDS 1.0, we had the chance to organize with data scientists, Camille Marini, Alexandre Gramfort and Balazs Kégl, a RAMP to improve the prediction models. We wish to continue this collaboration in CDS 2.0.