

# 3<sup>rd</sup> International Summit on **GMP, GCP & Quality Control** September 25-26, 2014 Valencia Convention Centre, Spain

## Minimization and optimization of water use in the process of cleaning containers

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This study concerns the minimization and optimization of water use in the process of cleaning containers in pharmaceutical industry. This process of cleaning is composed by four steps: prewashing, washing with an alkaline detergent, rinsing with city water, and final rinsing with purified water. Each step is considered as a factor, and the process of cleaning is studied by using a Design of Experiments (DOE). DOE allowed us to select points so that we maximize the accuracy of the information that we get from the experiments. A Central Composite Design was used to plan and to interpret controlled tests. In this study, we have two responses which are the residual concentrations of Active Pharmaceutical Ingredient and of detergent obtained after cleaning containers. These residual concentrations are obtained after swab sampling and by using ionic chromatography and UV spectrophotometry methods.

The aim of this study is to determine the steps of the cleaning process that have no effect on the responses, and in which we could minimize the amount of water used. The construction of a response surface could be used to optimize and to minimize the water use while keeping residual concentrations of API and detergent in respect with the criteria acceptance.

### Biography

Hanane El Asslani earned a Biochemistry Engineer Degree from National Institute of Applied Sciences (INSA de Toulouse). Working at Merial, a world-leading animal health company, in the production support department, he is in charge of the cleaning process validation related to the production of solutions for injection and dry pharmaceutical forms.

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