

Toward optimizing analytical methods in pharmacology

Editorial

The past century has seen great achievements in pharmacology which have also lead to the emergence of new fields of researches as sub-branches of pharmacology or related to therapeutics.¹⁻¹¹ The research methods have always been key elements in the related experimental approaches. Therefore optimizing them is a necessity for any future advances. Pharmacology represents an illustrative example of a field where laboratory analytical methods are crucial in determining the reliability of the results. Therefore, diver's publications¹²⁻¹⁵ have described analytical approaches in pharmacology.

Selecting the appropriate analytical methods represent the first challenge. Indeed, based what we would like to quantify or identify a method would be more appropriate than another method. For instance, we may have to choose between chromatography and spectroscopy to quantify an element. Although consulting references is important but finding out the best approach in divers conditions for specific circumstances remain more important.

Selecting the sample on which we would like to apply the selected analytical method could determine the results. For instance, if we want to quantify an organic element within a cells or a tissue we should consider the fact that this molecule may have two types, the part integrated within structures such as DNA or cell membrane and the part which is just "passing" via the metabolic process and that may never be integrated within the structural composition. Thus a pre-analysis separation of the part could optimize our results.

Another key element is the selection of the reagents to use during the analytical process of within the steps of the analytical sample preparation before the analysis. This is important in term of appropriateness. A reagent or a solvent which is supposed to be neutral toward the analytical method may interact with the live cells¹⁶ and thus lead to false results such as when cell culture approach is applied in drug development.⁶ In addition, the quality and the purity of the reagents and solvent have a significant influence of such approaches.

Herein, the importance of optimizing such approaches comes from the application they have in pharmacology. Researches in pharmacology need a high analytical precision due to the medicine dosage and drug development. For example the dosage may be the unique different between a drug and a toxic element.⁵ Importantly, the new advances in pharmacology such as those related to the G protein coupled receptors^{7,17,18} that represent the most important therapeutic target in the modern pharmacology^{19,20} could not probably be achieved without the application of optimized analytical methods in the related research works especially for natural products provided by pharmacognosy^{7,21-23} in which the analyses are extremely important.

Finally it is important to mention the influence that human manipulations and human-related factors have on the results of the analytical methods such as respecting the working conditions (like the temperature and the concentrations), the equipments maintenance

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and the laboratory hygiene with standards at least as high as those required in biomedical analysis.⁹ Therefore, an appropriate training of the laboratories personal and students about the best ways to conduct experiments is also a key element for a better application of the analytical methods in pharmacology toward drug development.

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Conflicts of interest

None.

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