CYCLE DE CONFÉRENCES DE CHIMIE

Avec le concours de : **Manufacture Française des Pneumatiques MICHELIN**
Ecole Nationale Supérieure de Chimie de Clermont-Ferrand
Institut de Chimie de Clermont-Ferrand (ICCF UMR 6296)
U.F.R.S.T. Département de Chimie

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Amphi de Chimie Paul REMI - (Site des Cézeaux)

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Formerly Head of Medicinal Chemistry Department and Scientific Director (Sanofi)

New Approaches in Medicinal Chemistry to Find and Optimize Biologically Active Compounds

In the pharmaceutical industry, innovation is the key word throughout R&D organizations to increase the output of original drugs. In the past few decades, innovative approaches have offered advances/opportunities in the field of medicinal chemistry. Thus, for instance, both rational design of advanced drug-delivery systems (small and large molecules) to the desired target site in the body, HTS and fragment based approaches - as alternative approaches to drug discovery through enzyme targeting - were pointed out to find new drugs. In addition nano-sized therapeutics (nanomedicines) have been highly developed to treat patients. Examples of nanotechnologies applied to drug development in order to increase therapeutic benefits, include lipid-based nanoparticles, self-assembling nanostructures and polymer-based nanoparticles such as dendrimers.

After a rapid overview of the current pharmaceutical industry issues, this presentation focuses on recent advances in medicinal chemistry and challenges based on the development of new approaches/techniques to find drugs. Thus, past and present scenarii for drug discovery including target identification and validation, Lead identification and optimization using optimization parameters follow-up metrics for chemical tractability, and drug-like properties finding ('druggability' concept) will be analyzed and discussed. Finally, personalized medicine and open innovation principles will be presented as new spirits becoming a powerful driving force to develop original drugs. A selection of several and representative examples of recent pharmaceutical strategies to find drugs will be presented. Also, new paradigms for drug discovery such as drug delivery machines will be analyzed.