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Challenging Organic and Medicinal Chemistry with Creative and Convergence Research

Organic synthesis is the study on the development of synthetic methodology and total synthesis of organic molecules, and can be applied to the fields such as foods, pharmaceuticals and materials. Organic synthesis needs both inductive and deductive approaches to develop efficient routes for constructing complex molecular architectures and controlling stereochemistry in natural products. In the area of synthetic methodology, multicomponent Ugi reaction, organic syntheses utilizing indium metal or Baker's yeast in aqueous media, and total synthesis of natural products such as rolliniastatin 1[1] will be presented.

Medicinal chemistry, related with design, chemical synthesis and development for the market of bio-active molecules, is highly interdisciplinary sciences at the interface of chemistry, pharmacology, various biology, and business. Practitioners need a strong background in these fields, and creative and convergence research is key strategies in the discovery of new drugs. In the area of medicinal chemistry, I focused on the development of drugs and diagnosis technology targeting GPCRs and ion channels for the treatment of neurological diseases. In addition, anticancer agents[2], anti-HCV, and antibiotic agents were also studied.

Recently, I have focused on the development of lipid nanoparticles for the formulation of mRNA vaccine and therapeutics which require safe, effective and stable delivery systems against coronavirus disease 2019 (COVID-19) and other infectious diseases.[3]

References

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