



第203回 OPERA研究交流セミナー  
第194回 ISIT有機光エレクトロニクス研究特別室セミナー  
第261回 未来化学創造センターセミナー



日時:2019年12月16日(月) 14:00~

場所:九州大学 共進化社会システムイノベーション施設 3F セミナー室

## Tailoring Benzothiazole Chromenone for Unmet Properties: Reversible Thermochromism, Acidochromism, and Aggregation Induced Emission

**Chao-Tsen Chen**

Department of Chemistry, National Taiwan University

Coumarins are well known charge-transfer chromophores, which have been widely investigated for lasing, organic light-emitting devices, biomolecular labeling, and chemosensors owing to their high photostability, high fluorescence quantum yields, and ease of the structural modifications. In this presentation, I would like to report new photoproperties and applications of new coumarin derivatives by judiciously imparting either electronic or sterically bulky substituents at different region-positions to the molecular framework of 3-(2'-benzothiazolyl) coumarin as well as modulating the dipole moments, respectively. For instances, two rather sterically bulky ortho-brominated aryl groups were implanted at the 7-position of a chromenone displaying a dual-color reversible thermochromism within minutes upon cooling or heating. While simply altering the regio-positions of an amino donating group on the chromenone, large stokes shift ( $\Delta\nu \geq 14,084 \text{ cm}^{-1}$ ), as well as strong solvatochromism tunable from green to near IR-region (from 536 to 714 nm), could be achieved. Furthermore, the acidochromism and vaporchromism analyses revealed the protonation occurred at the amino group rather on the benzothiazole indicating the regio position of the donating group having a drastic impact on the electronic distribution. Moreover, tetraphenylethene-fused coumarin derivatives exhibited unique aggregation induced fluorescence emissions and morphologies ranging from spheres to fibrils depending on the number of benzothiazole chromenones. These rather straightforward molecular designs represent a new dimension in tailoring photophysical properties for the development of novel organic fluorophores and for the construction of new temperature sensors as well as novel molecular switches.

主催:九州大学 最先端有機光エレクトロニクス研究センター  
:財団法人九州先端科学技術研究所(ISIT)  
共催:九州大学 未来化学創造センター