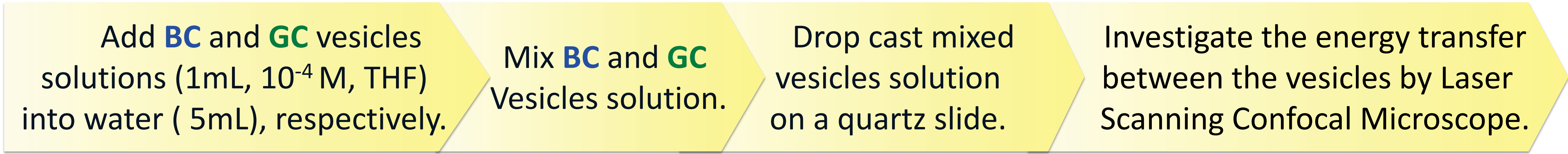


## 2) Energy transfer between BC and GC vesicles

### 1. Preparation



### 2. Observation with LSCM

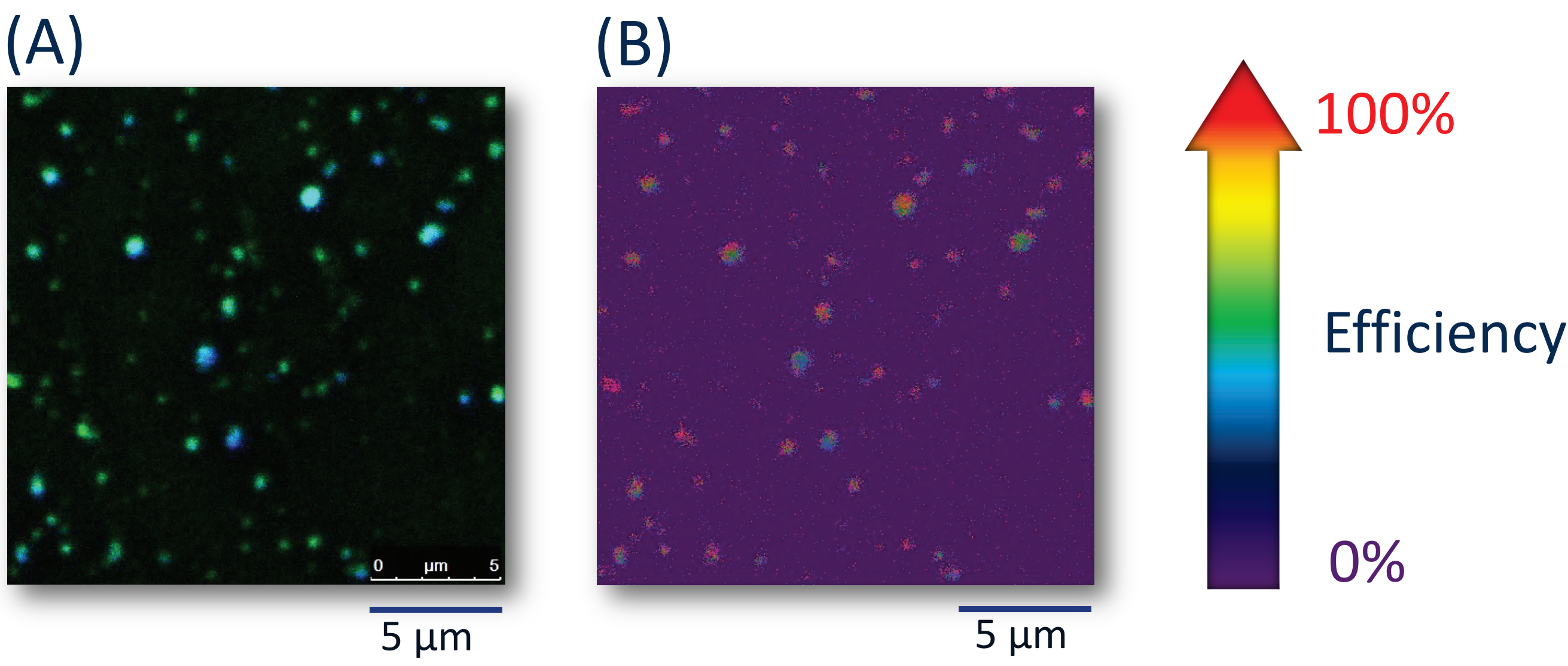
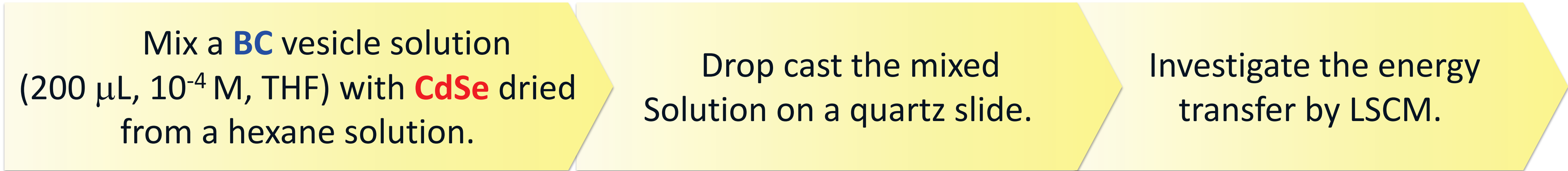


Figure 8. LSCM analysis of (A) BC and GC mixed vesicles, (B) Energy transfer efficiency profile.

The LSCM-observed discrete BC and GC vesicles indicate no interchanges between BC and GC molecules during the vesicle formation processes (Fig. 8A). Energy transfer behaviors can be observed on the BC-GC contacted vesicles as exciting on BC vesicles (Fig. 8B).

## 4. Potential application of the fluorescent hollow vesicles

### 1) Preparation of QDs inside the vesicles



### 2) Observation with TEM and LSCM

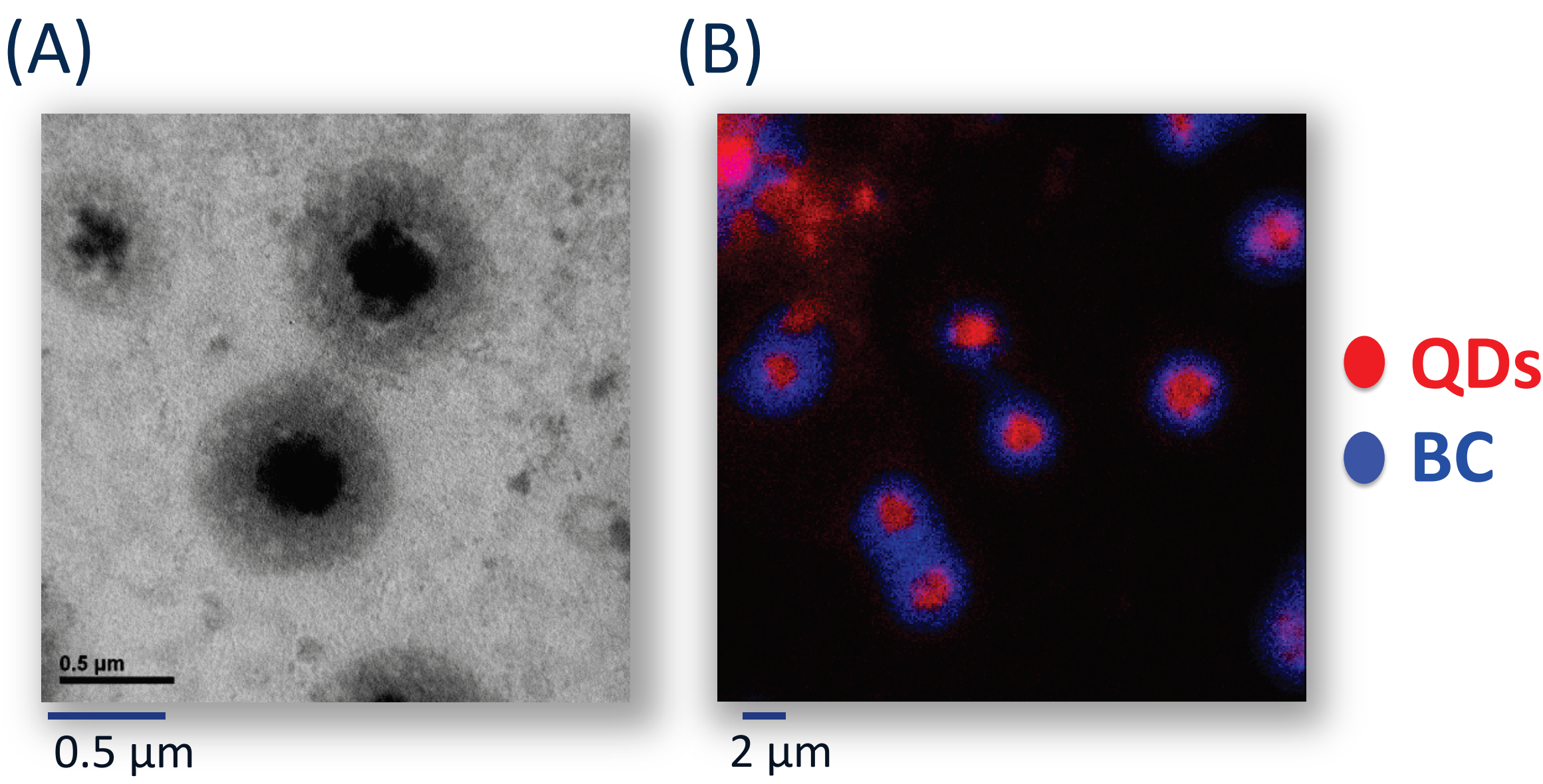


Figure 9. LSCM analysis of BC and CdSe mixed solution. (A) TEM image of QDs-encapsulated vesicles (B) Overlap of BC and CdSe

1. The CdSe quantum dots aggregating into a cluster was surrounded by blue light-emitting BC vesicles (Fig. 9A). The core-shell structure emits their individual fluorescence as observed by LSCM (Fig. 9B), and performs efficient energy transfer behavior due to the good spectral overlap.
2. TEM and LSCM results indicate that QDs were encapsulated inside the vesicles. Therefore, these self-assembled vesicles may have potential to serve as capsule for drug delivery with optical tracking ability.

## Conclusions

1. Two organic molecules (BC and GC), which are able to have light-emitting and self-assembly functions have been successfully synthesized.
2. Intermolecular forces such as hydrogen-bonding, van der Waals forces, and  $\pi-\pi$  interactions, appeared to play important roles in self-assembly.
3. Due to their good spectral overlap, efficient energy transfer behaviors between BC and GC vesicles have been verified by fluorescence titration and LSCM analyses.
4. The hollow nature of our light-emitting vesicles can be potentially used as an optical-tracking capsule for delivery purpose.

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(All photos by authors.)