

단백질 기반 메모리의 광전환성(photo-switching) 원리와 개선(The development of photo-switching protein based memory)

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Photo-switching fluorescence proteins (FPs) are switchable to a new fluorescent state by optical activation to generate a high level of contrast. Those FPs opened new opportunities in imaging techniques, optical sensors, and data storage units. Several prototypes of data storage system using photo-switching FPs have been developed. Those are read only or rewritable, in 2D or 3D, from micro to nanoscale, employing various types of FPs. The optical control of switching property between two different fluorescent states constitutes alternative basis for data encoding. However, there are still limitations mainly due to the bulky optical system to write and read.

The use of charge-coupled analysis system overcomes the limitation and opens a new opportunity for highly integrated system. We engineered the photo-switching proteins to meet the required properties for this novel memory system. This may guide to further mechanistic understanding of the light-driven process of various photo-switching FPs.