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Characterization of Activator of Photopigment and *puc* Expression, AppA from *Rhodobacter sphaeroides* 2.4.1

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Rhodobacter sphaeroides 2.4.1 is a facultatively photoheterotrophic bacterium. The AppA protein is required for increased photosystem gene expression upon transition from aerobic respiration to anaerobic photosynthesis condition. This protein has FAD binding domain in amino terminus and cysteine–rich motif in carboxy terminus. To assess the role of FAD binding in AppA function, we constructed an AppA derivative lacking the entire FAD binding domain. And to investigate the role of cysteine–rich motif, we constructed an AppA derivative lacking cysteine–rich motif. These derivatives complemented the AppA null mutant under aerobic and anaerobic growth conditions. And AppA is known as anti-repressor of PpsR, which controls expression of multple photosystem gene. To investigate the relation of AppA and PpsR, Western blot and gel mobility shift analyses were carried out. The PpsR activity is reduced in AppA null mutant compared with wild type. In complementation analysis the activity of PpsR is restored.