

Establishment of *Dictyostelium discoideum* expressing the alpha subunit of photoactivated adenylyl cyclase (PAC α)

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SUMMARY

Dictyostelium discoideum amoebae secrete cAMP as a signal for aggregation, and they aggregate and form multicellular structures when starved. We transformed an *acaA*-null mutant of *D. discoideum* with a plasmid carrying the alpha subunit of photoactivated adenylyl cyclase (PAC α). The null mutant is not able to form multicellular structures because of a deficiency in cAMP synthesis, but the transformant formed multicellular structures. These results indicate that PAC α produced cAMP and suppressed phenotype of the null mutant. However, it is necessary to note that there was a significant difference in the number of multicellular structures produced by light-irradiated and unirradiated cells. The number of multicellular structures formed by light-irradiated cells was approximately 30% of that formed by the unirradiated cells. These results suggest that overproduction of cAMP by PAC α inhibits cell aggregation.