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# Photomovement of *Dunaliella* Teod.

The *main objective* of this monograph is to critique the current understanding of photomovement in the unicellular green algae species *D. salina* and *D. viridis*.

The *specific aims* of this work are:

1. Review the historical development and current state of the art of investigations on algal photomovement;
2. Describe theoretical problems in terminology and the logic of the existing method for the classification of photomovement in these microorganisms;
3. Elucidate the primary characteristics of *D. salina* and *D. viridis*;
4. Critique the experimental methods utilized for the measurement of photomovement of these species and the effects of abiotic factors on photomovement;
5. Describe the processes of photoreception – location and structure of photoreceptor systems, composition of photoreceptor pigments, mechanisms of photoreception, and photoorientation of the two species;
6. Describe the processes of sensory transduction of absorbed light into signals that govern the activity of the motor apparatus of the two species;
7. Assess the possible application of *D. salina* and *D. viridis* as models for testing the quality of aquatic media and estimating the effects of surface-active substances, salts of heavy metals, and pesticides on photomovement in algae;
8. Assess the potential of the two species of *Dunaliella* for transgenic alteration to enhance the synthesis of  $\beta$ -carotene, ascorbic and dehydroascorbic acids, glycerol and other valuable organic compounds;
9. Assess the implications of photomovement on evolutionary biology, phylogenetics, systematics and taxonomy, ecology and geography of algae;
10. Critique critical areas for future research on the biology of photomovement in flagellates.