Abstract Submitted
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Oxygen dynamics in photosynthetic membranes.[1] SERGEI SAVIKHIN, SHIGEHARU KIHARA, Purdue University — Production of oxygen by oxygenic photosynthetic organisms is expected to raise oxygen concentration within their photosynthetic membranes above normal aerobic values. These raised levels of oxygen may affect function of many proteins within photosynthetic cells. However, experiments on proteins *in vitro* are usually performed in aerobic (or anaerobic) conditions since the oxygen content of a membrane is not known. Using theory of diffusion and measured oxygen production rates we estimated the excess levels of oxygen in functioning photosynthetic cells. We show that for an individual photosynthetic cell suspended in water oxygen level is essentially the same as that for a non-photosynthetic sell. These data suggest that oxygen protection mechanisms may have evolved after the development of oxygenic photosynthesis in primitive bacteria and was driven by the overall rise of oxygen concentration in the atmosphere. Substantially higher levels of oxygen are estimated to occur in closely packed colonies of photosynthetic bacteria and in green leafs.

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