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Bistable and Sensitizing Pigments in Vision

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Invertebrate Photoreceptors: Terminology and Abbreviations

One of the subjects of discussion among the participants was the confusion (and proliferation) of terms in the field of invertebrate photoreceptors, and a group, including most of the authors of these papers, decided to make the following recommendations for standardising the terminology and abbreviations.

A. Potentials

1. The slow afterpotentials resulting from certain pigment manipulations by light: *Prolonged depolarising afterpotential (PDA)* (previously also "tail" and "latch-up") and *prolonged hyperpolarising afterpotential (PHA).*
2. The reduction of the PDA by further pigment manipulation: *PDA-depression* or, if complete, *PDA-suppression* (previously also "kill" and "knock-down").
3. The observation of a period of impeded PDA-induction following appropriate pigment manipulation by light: *Anti-PDA.*
4. The receptor potential which coincides with or closely follows illumination but excluding the early receptor potential (ERP) and the PDA: *Late receptor potential (LRP)* (previously also "stimulus-coincident LRP").
5. The fast potential observed in some insects which appears to have properties different from the ERP: *M-potential.*

B. Pigment and Pigment Properties

1. The pigment (P) has states rhodopsin (R) and metarhodopsin (M).
2. Concentration of P, R or M is written c_P, c_R or c_M.

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3. Photosensitivity χ is the (molecular) extinction coefficient α times the *conversion quantum efficiency* γ for converting one long-lived or stable pigment state into the other (in a "bistable" system).
4. The conversion quantum efficiency γ is a *weighting factor* W times the *isomerisation quantum efficiency,* where W is thus defined as the fraction of isomerisations resulting in conversion.
5. Pigments absorbing light and transferring the energy to the isomerisation of visual pigments will be called *sensitising pigments.* If the mechanism is known to be the Förster mechanism (dipole-dipole interactions) the pigment may be called an *antenna pigment.*
6. The dependence of the pigment state populations on wavelength of photo-equilibrating (saturating) light: *Photo-equilibrium spectrum* (previously Q-curve, saturation spectrum).

C. Fly Retinula Cells

R1–6, R7/8.