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Functional isolation of normal human opponent-colour processes at increment threshold

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Test spectral sensitivities of the human eye were measured under conditions facilitating chromatic, opponent-colour function (Foster & Snelgar, 1983). Peaks at about 530 and 610 nm in the traditional curve obtained for a 1·05 deg 200 ms test flash on a 10·0 deg 3000-Td white auxiliary conditioning field become sharper when the auxiliary field is made spatially coincident with the test field (Fig. 1*A*).

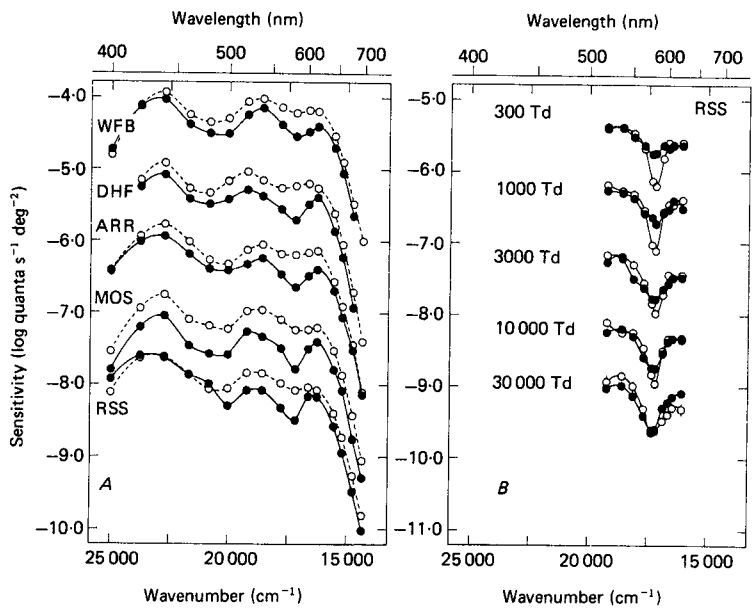

Fig. 1. Test spectral sensitivities (*A*) for a 1·05 deg flash on a concentric, 3000-Td auxiliary field, diam. 10·0 deg (○) or 1·05 deg (●) (five subjects, each curve shifted 1 log unit successively upwards); and (*B*) for the same flash on a coincident auxiliary field, for simple detection (●) and for colour detection (○), as a function of auxiliary-field retinal illuminance (each curve shifted 0·5 log unit successively upwards, one subject).

To test whether this combination of spatial and achromatic adaptation induced complete suppression of non-opponent function in the critical region around 580 nm, spectral sensitivity was then measured both for simple detection of the test flash and for colour detection, the latter necessarily entailing activity by the chromatic system. For auxiliary-field retinal illuminances of 3000 Td and greater, simple-detection and colour-detection curves closely overlapped (Fig. 1*B*), implying almost complete isolation of opponent-colour processes.

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REFERENCE

Foster, D. H. & Snelgar, R. S. (1983). *Vision Res.* **23**, 787–797.