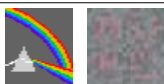


## The Colour Group (GB) Palmer Awards Meeting



### Assessment of Chromatic Sensitivity in Female Carriers of Colour Vision Deficiency

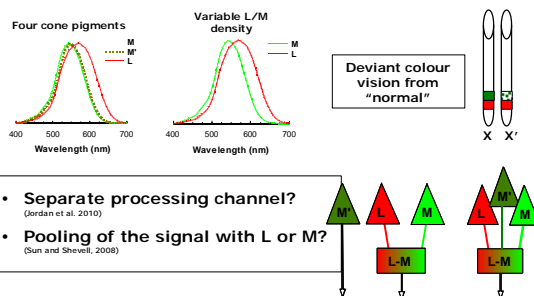
E. Konstantakopoulou, M. Rodriguez-Carmona, J.L. Barbur



Department of Optometry  
Applied Vision Research Centre  
The Henry Wellcome Laboratories for Vision Science

## Background

- X-inactivation: Each cone cell has 50% chances of expressing the normal or the "deficient" pigment (Lyon, 1961)



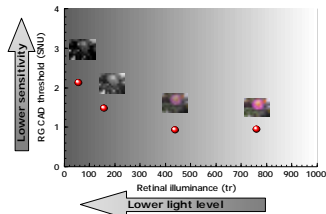
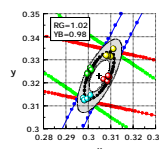
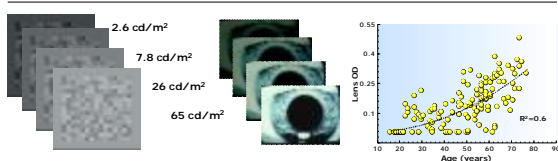
- Separate processing channel?  
(Jordan et al., 2010)

- Pooling of the signal with L or M?  
(Sun and Shevell, 2008)

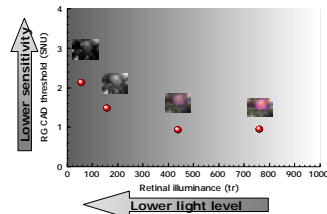
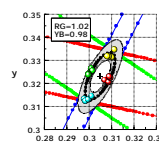
### CAD test

### P\_SCAN

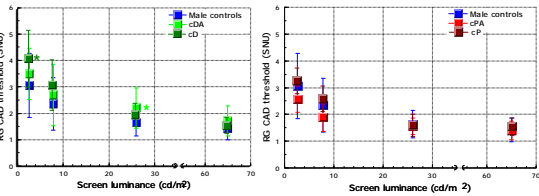
### MAP test



	Males	cDA	cD	cPA	cP	p
n	26	16	7	6	7	
Age (years)	51.2 ± 14.1	54.0 ± 14.9	54.7 ± 7.3	51.0 ± 8.7	49.1 ± 13.0	0.87
E 2.6-65cd/m² (tr)						all p>0.05
YB 2.6-65cd/m² (SNU)						all p>0.05

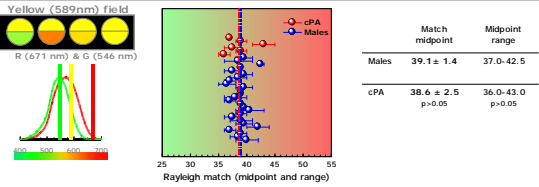


Chromatic sensitivity



- Deutan carriers show reduced chromatic sensitivity
- Also reported by S.M. Hood , J.D. Mollon , L. Purves and G. Jordan (2006)

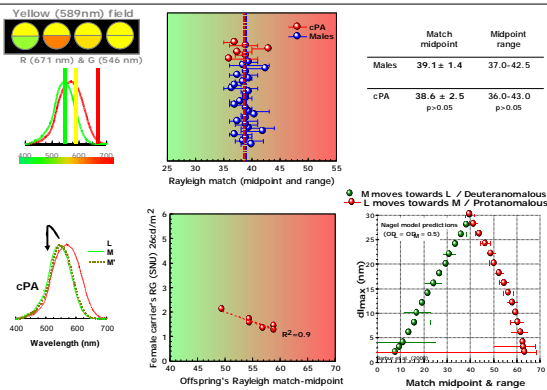
Rayleigh matches cPA



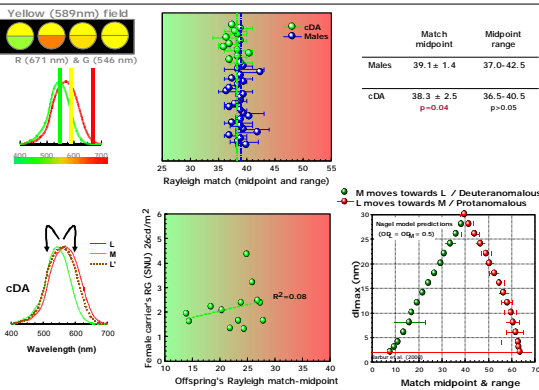
Small, insignificant deutan shift of the cPA Rayleigh match midpoint

Deutan shift	No shift	Protan shift
Wieland, 1933	Jordan et al. (2010)	Schmidt (1934, 1955)
	Waeler (1927)	

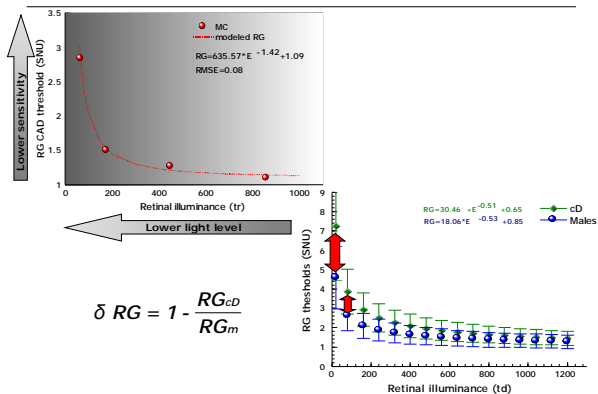
Rayleigh matches cPA



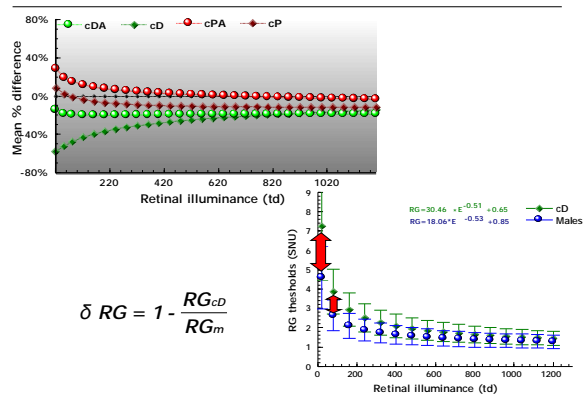
Rayleigh matches cDA



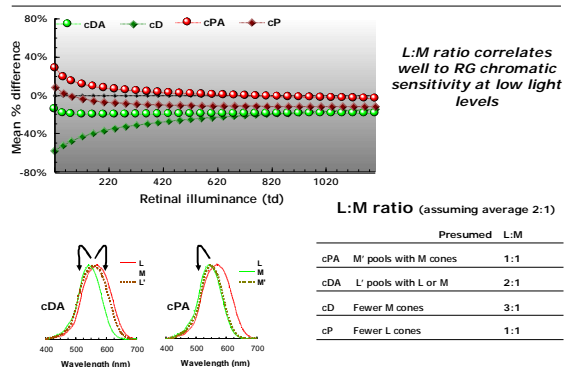
## Effects of retinal illuminance



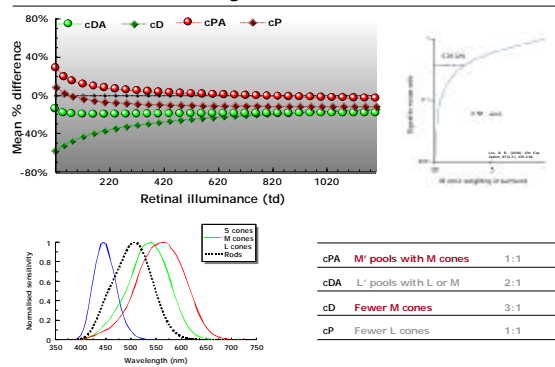
## Effects of retinal illuminance



## ... ICVS 2011

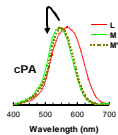


## M cone density

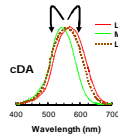


## Conclusions

- In cPA M' pools preferentially with M
  - Potential for improved chromatic sensitivity at low light levels



- In cDA L' pools randomly with L or M



- The absolute number of M cones seems to affect RG chromatic sensitivity mainly at low light levels for cD

Thank you!



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