

# Y3: Monocular and Binocular Visual Acuity Changes with Luminance-modulated and Contrast-modulated Letters in Visually Normal Eyes throughout Adulthood

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## ABSTRACT

**Introduction:** Evidence that human visual performance declines with normal ageing abounds. However, age-related visual acuity (VA) changes with contrast-modulated stimuli still remain unclear. This study was conducted to evaluate the effect of healthy ageing on visual acuity using luminance-modulated (LM) and contrast-modulated (CM) letter stimuli. **Methods:** We measured VA with LM and CM letter stimuli monocularly and binocularly in healthy and visually normal adults aged between 21 to 70 years old. **Results:** VA with LM letters was better than that with CM letters ( $p < 0.05$ ). There was a significant decrease in VA with ageing for both stimulus types ( $p < 0.05$ ). Throughout adulthood, binocular VA was better than monocular VA ( $p < 0.05$ ) and binocular summation ratio for CM letters was significantly higher than that for LM letters ( $p < 0.05$ ). Piecewise models showed that VA with LM letters (monocular and binocular) improved (logMAR vs age slope of  $\sim -0.013$ ) until the age of  $35 \pm 0.90$ , followed by a decline (slope of  $\sim 0.009$ ) with increasing age. A similar trend is observed for monocularly viewed CM letters. However, for binocularly viewed CM letters, the best VA was obtained in our youngest age group up to age of  $37 \pm 5.88$  followed by a decline with increasing age. **Conclusion:** A young binocular visual system may give advantage for resolving CM letters over LM letters and older age. VA measurements with contrast-modulated stimuli might be useful to detect subtle binocular anomalies which would be missed if measured with luminance-modulated stimuli.

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# Y4: Time-Kill and Scanning Electron Microscope Studies of Pterostilbene against Human Pathogens

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## ABSTRACT

**Introduction:** Pterostilbene is an analogue to resveratrol which is found in blueberries and grapes. The antibacterial activity of pterostilbene in combination with gentamicin against six strains of Gram-positive and Gram-negative bacteria were investigated. **Methods:** The minimum inhibitory concentration of pterostilbene were determined using microdilution technique whereas the antibacterial activities of pterostilbene in combination with gentamicin were assessed using time-kill kinetic study. Scanning electron microscopy (SEM) was used to study the morphological alteration of the bacteria cells treated by pterostilbene. **Results:** Results of the present study showed that pterostilbene exhibited inhibitory effects against three bacteria strains as followed: *Staphylococcus aureus* ATCC 25923, *Escherichia coli* O157 and *Pseudomonas aeruginosa* 15442. The time-kill study showed that combination effects of pterostilbene with gentamicin was indifference which did not significantly differ from the gentamicin treatment. Furthermore, time-kill study also showed that the growth of bacteria was completely attenuated within 24 hours treatment with  $0.5 \times \text{MIC}$  of pterostilbene and gentamicin. The SEM results confirmed that the pterostilbene-treated *S. aureus* and *E. coli* cells were damaged, showing formation of pores and blebs in the cell wall of the bacteria, while significant changes in cell shape were observed in *S. aureus*. **Conclusion:** The identified antibacterial effects could be of effective therapeutic value against bacterial infections.