Presented at the International
Conference on the Excited States
of Biological Molecules, Lisbon,
Portugal, April 18, 1974

LBL-2383

# LUMINESCENCE FROM THE PEPTIDE GROUP

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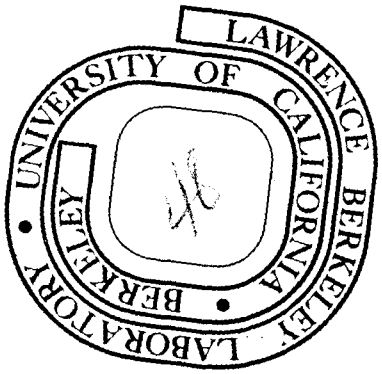
March 1974

Prepared for the U. S. Atomic Energy Commission
under Contract W-7405-ENG-48



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## DISCLAIMER

Session D

# Luminescence from the Peptide Group*

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Previous work in the excited states of proteins has concentrated exclusively on absorption and emission by the "aromatic" group, phenylalanine, tyrosine and tryptaphane, and the properties of the peptide group have been studied in absorption only. We report now the detection of emission characteristic of the peptide group using apparatus constructed specifically for this purpose. The excitation source was a 1 kw hydrogen discharge (Hinteregger type), dispersed by a McPherson Model 225 1 meter scanning vacuum UV monochromator. The exciting beam was monitored by a sodium salicylate screen and an RCA 6199-Keithley 417 picoammeter-Speedomax recorder combination. Excitation wavelengths between 1900 Å and 2400 Å were used at a bandwidth of 3.3 nm. The emitted radiation was collected by a 50 mm Spectrosil lens system and analysed by a Jarrel-Ash 0.25 meter scanning monochromator equipped with a grating blazed at 3000 Å, also at a bandwidth of 3.3 nm. The dispersed radiation was detected by an EMI 6256 photomultiplier, cooled with liquid nitrogen and operated in the photon counting mode. Signal counts were then transferred to a 400 channel analyser (RIDL 32-1213) operated in the multiscaling mode. At 1750 Å a dark count rate of 12 counts/sec was observed. Emission spectra have routinely been measured

from 200 nm to 612 nm and excitation spectra from 200 nm to 280 nm.

Very similar spectra have been observed for N-acetylglycine, N-acetylalanine, acetamide and N-methylacetamide. Apart from obvious scatter peaks, the spectra are complex. Most prominent is an emission peaking at 300 nm with a head at ∿255 nm (4.9 eV). This emission is obtained on exciting at 240 nm and hence is tentatively assigned to an $n\pi^*$ state. At lower energies a broad shoulder is observed from 325 nm-380nm (3.8 eV-3.2eV) and a clear but weak peak at 480 nm (2.6 eV). On exciting at higher energies (1950 Å) a stronger, narrower peak is observed at 240 nm. Present data do not allow us to determine the head of this emission which indeed may be structured but its position and intensity is consistent with it originating from a $\pi\pi^*$ state.

No emission has been observed from N-diethylacetamide.

*Work performed under the auspices of the U. S. Atomic Energy Commission.

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