EFFECT OF CERTAIN ANTIBACTERIAL AGENTS ON THE INFRARED SPECTRUM OF MICROCOCCUS PYOGENES VAR. AUREUS

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Received for publication February 9, 1953

The report of Stevenson and Bolduan (Science, **116**, 111, 1952) that species of bacteria could be differentiated by their infrared spectra suggested that this technique might be employed to study the effects of antibacterial agents on the organism.

The preliminary experiments here reported were concerned with the effect of benzalkonium chloride (0.1 per cent) and phenol (5 per cent) upon the infrared spectrum of *Micrococcus pyogenes* var. *aureus*, strain 290. To 10 ml of a 22 to 26 hour nutrient broth culture of the test organism, 1 ml of the disinfectant was added, the mixture allowed to stand 10 minutes at room temperature, and then centrifuged. The sediment was spread evenly in a band about 20 mm wide over the diameter of the silver chloride plates and dried over anhydrous calcium sulfate. Thus, films of sufficient density to give from 80 to 90 per cent transmission at 5.50 μ and little general light scattering, and yielding spectra easily reproduced in replicate experiments were obtained. A control, consisting of an untreated culture of the test organism handled in an identical manner, was run with each test. The Perkin-Elmer Model 21 infrared spectrophotometer was used for recording the spectra from 5.0 to 11.0 μ.

By comparing the spectrum of the untreated organisms with that obtained after treatment with the antibacterial agent, it was observed that phenol markedly reduced the band at 7.17 to 7.20 μ and had slight, if any, effect on the band occurring at 8.18 to 8.20 μ. On the other hand, benzalkonium chloride (Roccal) obliterated the 7.17 μ band and showed a more pronounced decrease in the intensity of the 8.18 μ band. In no instance was a new absorption band noted.

These results indicate that antibacterial agents can affect selectively the infrared absorption bands of treated bacteria; hence the procedure may offer a useful tool for relating chemical structure to mechanism of activity. Experiments towards this are continuing.

A CLASSIFICATION OF THE HEMOLYTIC BACTERIA OF THE GENUS HAEMOPHILUS: HAEMOPHILUS HAEMOLYTICUS BERGEY et al. AND HAEMOPHILUS PARAHAEMOLYTICUS NOV SPEC

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Received for publication February 16, 1953

Pritchett and Stillman (J. Exptl. Med., **29**, 1919) described a bacillus similar to, but distinguished from, "*Bacillus influenzae*" by its ability to hemolyze blood. They called it "Bacillus X". The next year Stillman and Bourn (J. Exptl. Med., **32**, 665, 1920) showed a lack of uniformity in the biochemical activities of hemolytic bacteria, but it was not until Rivers (Johns Hopkins Hosp. Bull., **33**, 149, 1922) observed that a hemolytic strain required both of the factors X and V for growth that there was any information on the accessory growth requirements. Later Fildes (Brit. J. Exptl. Path., **5**, 69, 1924) reported that 13 of 14 hemolytic strains required only the V factor, while the remaining one required both X and V. Valentine and Rivers (J. Exptl. Med., **45**, 993, 1927) proposed that all the bacilli that require both X and V be classified as *B. influenzae* (*Hemophilus influenzae*), nonhemolytic and hemolytic, and that those that