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Isolation of *Listerella monocytogenes* from Infectious Mononucleosis.*

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The clinical condition commonly designated in this country as infectious mononucleosis, but classified elsewhere as glandular fever or monocytic angina, remains undetermined in etiology despite the attempts undertaken to clarify its nature. The more definite reports on this subject disclose a single observation by Nyfeldt¹ which suggests the causative agent to be an organism of the *Listerella* group, subsequently named *Bact. monocytogenes hominis*. More recently, Bland² expressed the opinion that a protozoön of the species *Toxoplasma* might be causally related to the disease. His study indicates that the "toxoplasma of glandular fever" is immunologically inseparable from *T. cuniculi*, but differentiable from the latter by its absolute virulence for monkeys and its greater virulence for rabbits. Since the etiology of this disease is still obscure and even disputed, it seems important to place on record observations made in our laboratories on a patient with infectious mononucleosis.

The clinical history of the individual studied is characterized by the more or less typical manifestations of the disease, which ran a course of about 3 weeks. A white girl, 16 years of age, had undergone chills, fever, and general malaise for 5 days preceding entry into the Monmouth Memorial Hospital. Upon admission, she complained of a severe angina, and on physical examination she was found to have a temperature of 102°F, enlarged cervical and axillary glands, and a palpable spleen, with no other particular signs. The results of her urinalysis were well within normal limits, while her blood gave a hemoglobin value of 76%, with a red-cell count of 3,300,000 and a white-cell count of 11,000, consisting of 23% polymorphonuclear cells, 37% lymphocytes, and 40% monocytes. Several blood enumerations were made during her stay in the hospital, and these revealed a fairly uniform hemoglobin and red-cell count,

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¹ Nyfeldt, A., *C. R. Soc. biol.*, 1929, **101**, 590.

² Bland, J. O. W., *Brit. J. Exp. Path.*, 1931, **12**, 311.

while the white-cell count reached as high as 17,700, with polymorphonuclears as low as 12% and both lymphocytes and monocytes attaining abnormally high figures.

Serologically, her blood contained no agglutinins for *B. abortus*, or typhoid, or paratyphoid bacilli A and B, but did agglutinate sheep's red blood cells (heterophile test) to a titer of 1:128.

Thus it is seen that a diagnosis of infectious mononucleosis is justified by the clinical manifestations, the changes in blood elements, and the presence of heterophile antibody.

A single culture made from the throat revealed predominantly hemolytic streptococci and a small gram-positive rod-like organism which was unfortunately discarded at the time as probably adventitious. A blood culture taken during the fourth day of hospitalization (ninth day of the disease) yielded on the fourth day of incubation a small gram-positive rod resembling that seen in the throat-culture. On plating, the organism was found to form small colonies, incompletely hemolytic, and suggestive of *Listerella monocytogenes*.

The organism isolated from the blood proved to be fatal for rabbits, guinea pigs, and white mice, in each animal inducing the lymphocytic-monocytic changes seen not only in the patient, but similarly observed by Murray, Webb, and Swann³ as a result of spontaneous infection in the rabbit due to *Bact. monocytogenes*. The culture was found to agglutinate to titer in homologous anti-monocytogenes serum. It was also demonstrated that upon instillation in the conjunctival sac of rabbits or guinea pigs the organism caused a purulent conjunctivitis later characterized by corneal vascularization. This latter reaction will be described in greater detail in a subsequent communication as possibly diagnostic of *Listerella monocytogenes*.

Since the morphology, the motility, and the biochemical and fermentative reactions also coincided with the corresponding attributes of *Listerella monocytogenes*, the organism cultivated from the patient's blood was ultimately classified as such. Before identification of the culture was made, the patient had been discharged as well, and blood taken 6 weeks after recovery showed no agglutinins either for the organism isolated or for sheep's red cells.

³ Murray, E. G. D., Webb, R. A., and Swann, M. B. R., *J. Path. and Bact.*, 1926, 29, 407.