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## 4. Development of the complement-fixation test

Mackie TJ, Finkelstein MH. J Hyg 1930; 30: 1–24

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Diagnostic microbiology, first by the visualization of organisms followed by culture of pathogenic organisms, developed at the end of the 19th and the beginning of the 20th century. The detection of specific antibody as a means of diagnosing infection followed. One of the most enduring of these antibody assays has been the complement-fixation test, which is still in use 40 years after its development by Bradstreet and Taylor in 1962 [1]. Despite the development of more sensitive assays such as RIA and ELISA, the serological diagnosis of many respiratory infections is still often achieved by means of the complement-fixation test. Some of these pathogens such as influenza viruses are also diagnosed by culture although obtaining acute phase specimens for culture is problematic. Other organisms such as *Mycoplasma pneumoniae* and *Coxiella burnetii*, although cultivable are seldom diagnosed by this means because most diagnostic laboratories are not able to perform culture routinely. Diagnosis of these treatable infections is usually made by use of the complement-fixation test.

The work performed by Mackie and Finkelstein in 1930 [2] was an important step in the development of the complement-fixation test in use today and developed work performed previously by these authors [3].

This paper explored the detection of antibodies to various bacterial pathogens such as *Vibrio cholerae* in human and animal serum samples. This paper is also important because it demonstrated the effect of inactivating sera by heating and 55 °C was chosen as the inactivation temperature which inactivates complement in serum samples under test. The thermostability of bacterial antigen suspensions was also determined.

These early studies helped to investigate the immunology of bacterial infections. They also provided the basis for the development of diagnostic tests which are still in use today, over 70 years later.

### References

1. Bradstreet CMP, Taylor CED. Technique of complement fixation test applicable to the diagnosis of virus diseases. PHLS Bull 1962; 21: 96.
2. Mackie TJ, Finkelstein MH. Complement fixation by the interaction of normal serum and bacterial suspensions – a contribution to the study of natural immunity phenomena. J Hyg 1930; 30: 1–24.
3. Mackie TJ, Finkelstein MH. A study of non-specific complement-fixation with particular reference to the interaction of normal serum and certain non-antigenic substances. J Hyg 1928; 28: 172–197.