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THE DETERMINANTS OF MICROBIAL PATHOGENICITY(U)  
BIRMINGHAM UNIV (ENGLAND) DEPT OF MICROBIOLOGY H SMITH  
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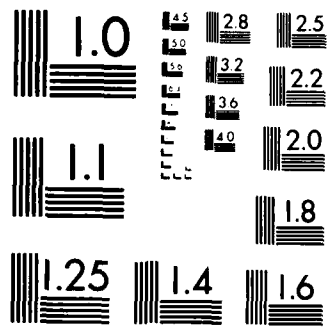
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The Determinants of Microbial Pathogenicity

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In the past decade there has been a revival of interest in microbial pathogenicity. The reasons for this revival are two-fold. First, infectious disease is still with us despite the impact of the antibiotic era. Second, the subject of microbial pathogenicity is ripe for application of techniques of biochemistry, molecular biology and genetics that have developed in other areas of biology over the past twenty years; and the potential of these techniques is particularly attractive to young people, who are entering the field in increasing numbers.

The terms pathogenicity and virulence are synonymous; they mean the capacity to produce disease, and both will be used in this lecture. To be pathogenic a microorganism must be able to:

1. Infect the mucous surfaces of the respiratory, alimentary or urogenital tracts. Some microbes are introduced into the host directly through the skin by trauma or vector bite but the majority of infections start on the mucous surfaces.
2. Enter the host usually by penetration of the mucous surfaces. A few microbes can cause disease by growing on the mucous surfaces, for example cholera bacilli, but the majority enter the tissues to cause disease.
3. Multiply in the environment of the host's tissues.
4. Resist or interfere with host defence mechanisms that try to remove or destroy them.
5. Cause damage to the tissues of the host.

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All five steps, or the last three if there is direct introduction into the

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tissues, must be accomplished for pathogenicity. Loss of ability to carry out any one of the steps causes the microbe to lose virulence. The cardinal fact about pathogenicity is its multifactorial nature.

The aim in this field is to identify the determinants of pathogenicity i.e. the microbial components and products responsible for the five essential requirements of pathogenicity.

In this lecture I shall survey the methods and difficulties of investigating microbial pathogenicity and what we know at the molecular level of the five main aspects of the subject outlined above. I shall use bacteria as examples because more is known about them than other types of microbes.

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