

'Surface recognition' in horse eosinophils and neutrophils: Sendai virus and antibody-coated target cells

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Eosinophils and neutrophils share several biochemical features. Amongst these is the elaboration of reactive oxygen intermediates (ROI) toxic for both self and non-self. Using the technique of chemiluminescence (CL) measurement, we have investigated whether horse eosinophils produce ROI in response to a panel of agents known to activate neutrophils. Both neutrophils and eosinophils could be triggered to produce CL by A23187 and PMA, although only neutrophils generated a burst of CL when probed with Sendai virus. The virus agglutinated both eosinophils and neutrophils, and binding to the respective cell surfaces was also evident in electron micrographs. Moreover, antibody-coated erythrocytes and cells infected with equine Herpes virus Type I and coated with antiviral antibody evoked CL in neutrophils only. Our experiments suggest that different control mechanisms may underlie ROI generation in eosinophils and neutrophils once the stimulating agent has bound to the cell surface.

In vivo analysis of the immunosuppressive variant of minute virus of mice

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The minute virus of mice (MVM) is an autonomously replicating parvovirus that commonly infects mice, without clinical disease. We have demonstrated previously (Engers et al., J. Immun. 127 (1981) 2280), that a variant MVM(i) inhibits a number of T-lymphocyte functions in vitro. The prototype virus MVM(p) shows none of this immunosuppressive behavior. The experiments described here were designed to investigate whether MVM(i) could have immunosuppressive activity in vivo. We used the following criteria to evaluate the immunological competence of mice infected with either MVM(p) or MVM(i): 1) Delayed type hypersensitivity response to sheep red blood cells and to inactivated herpes simplex virus. 2) Rejection of an allogeneic tumor from the peritoneal cavity. 3) Evolution of a footpad tumor induced by Moloney sarcoma virus. None of the immunological assays we performed revealed any differences between the in vivo effects of an MVM(p) or MVM(i) infection. To investigate the replication of MVM in infected animals, we have assayed for the presence of RF DNA in infected organs. To study the pathogenesis of the two strains in neonatally infected mice, we used the whole mouse hybridization technique.

Microbiology and Environment

Isolation of new aerobic nitrilotriacetate(NTA)-degrading microorganisms

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Until recently, only three *Pseudomonas* sp. which can grow with NTA as their sole source of carbon and nitrogen have been isolated in pure culture. Two of the species are known to metabolize NTA via a monooxygenase. By employing a different isolation strategy than was used previously, namely by setting up batch enrichment cultures with NTA as the sole nitrogen source and a mixture of glucose/acetate/methanol as carbon sources, several strains of non-pseudomonads were isolated in pure cul-

ture from both soil and wastewater samples. All the new isolates are also able to grow with NTA as their sole source of carbon and nitrogen. However, higher growth rates were observed when the cells were supplied with an additional carbon source together with NTA. In the new isolates tested so far no classical NTA monooxygenase activity could be detected in cell-free extracts of NTA-grown cells. This suggests that either this enzyme, if present in these microorganisms, is extremely labile or NTA is degraded via a different pathway. Additional properties and growth characteristics of the new strains are reported.

Acidic rain and microbiology: disturbances in biogeochemical cycles in aquatic ecosystems

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Acidic rain with its anthropogenic air pollutants leads to enhanced erosion of carbonate and silicate rocks and to acid leaching of soils. As a consequence, the release of metal cations and salt anions into aqueous environments is increased. Acidic rain therefore may influence microbial behavior in aquatic ecosystems two-fold:

- 1) Increased concentrations of certain cations inhibit various metabolic functions and
- 2) elevated concentrations of certain anions (NO_3^- , SO_4^{2-}) increase the extent to anaerobic mineralization processes. Concomitantly released nutrients and toxic metabolites lead to secondary disturbances. Microbial denitrification and sulfate reduction are affected most by acidic rain. These and associated microbial processes may serve therefore as sensitive indicators of environmental changes in lake ecosystems. Studies on sediments of eutrophic lakes and in the meromictic Lago Cadagno (TI, Switzerland) illustrate possible influences of acidic rain on biogeochemical cycles in these ecosystems.

Microbiological quality and spoilage of food

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The microbial spoilage of foods is determined by intrinsic and extrinsic factors which are highly influenced by processing. The associations of microorganisms of the 'biotope' food will therefore be determined decisively by the technology of processing. The modern and contrary demands made by the consumer on the foods are difficult to meet: less processing, naturalness, 'biological' and fresh, at the same time mostly pre-prepared and with a long shelf-life. All these requirements are not compatible for microbiological reasons:

- every preservation causes relatively drastic changes of the product,
 - freshness, i.e. a possibly careful processing can only be realized with a nonsterile food with a limited shelf-life.
- Important essentials for better preservation methods are a profound knowledge of:
- microbiological ecology of the 'biotope' food,
 - the microorganisms which cause spoilage as well as their properties important in technology,
 - the reaction mechanisms of inhibition, killing and also resistance of microorganisms in foods.

Microbial characteristics of disease-suppressive soils: a review

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The biological factors of disease-suppressive soils (soils which impeded the development of specific soil-borne diseases) are intensively studied at universities and in industries. The aim is to understand the mechanisms of disease-suppressiveness and to