

Schweizerische Gesellschaft für Mikrobiologie *Berichte der 42. Jahresversammlung*

Société Suisse de Microbiologie *Comptes rendus de la 42^e réunion annuelle*

Società Svizzera di Microbiologia *Rendiconti della 42^{ma} sessione annuale*

Swiss Society of Microbiology *Reports of the 42nd annual meeting*

Fribourg, 9–11 June 1983

The Society Prize 1983

The Society Prize has been allocated to Dr Rosmarie Honegger, Institut für Pflanzenbiologie, University of Zürich, in recognition of her contribution to the problems of symbioses between 'algues and fungi'.

Main lectures

Prof. Dr W. Bredt, Institut für allgemeine Hygiene und Bakteriologie, Universität, Freiburg i.B., Federal Republic of Germany: 'Mycoplasmen – Prokaryonten mit besonderen Eigenschaften.'

Prof. Dr J. Bové, Laboratoire de biologie cellulaire et moléculaire, Université, Bordeaux, France: 'Les Spiroplasmes, un nouveau groupe de mycoplasmes pathogènes des végétaux, animaux et insectes.'

Dr F. Catalan, Institut Alfred Fournier, Paris, France: 'Diagnostic dans les clamydioses humaines.'

Round table discussions

Conclusions from the 'Round table discussions' held at the 1983 annual meeting of the Swiss Society of Microbiology.

Lectures

Mycoplasmas – prokaryotes with peculiar properties

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Microorganisms of the *Mycoplasma* group are characterized by the lack of cell wall, the limited genom and their small size. There are certain biological consequences of these properties. Due to the lack of cell wall the cytoskeleton actively determines the cell shape. The configuration of membrane surface proteins is influenced by factors like fluidity or membrane potential. Lateral clustering ('capping') seems possible. Being obligate parasites the mycoplasmas possess efficient adherence mechanisms. In *Mycoplasma pneumoniae* the binding site was characterized as membrane protein of 190 kD localized on the tip structure. The limited genom size (5×10^8) results in requirement for preformed substances (cholesterol, fatty acids, nucleic acid precursors). They are prob-

ably at least in part obtained actively from the host by certain mechanisms (e.g. by nucleases). In the interaction with the host organism the intensity of clinical symptoms is to certain extent determined by the host's defence reaction. Especially immunological processes seem to contribute to the occurrence of disease.

Round table discussions

Conclusions from the round table discussions held at the 42th annual meeting of the Swiss Society of Microbiology.

Laboratory diagnostic of *Mycoplasma* and *Ureaplasma* infections

The following points were discussed:

- Procedures to be followed for isolation attempts of Mycoplasmas and of Ureaplasmas: choice of the adequate specimens; techniques to be used for their collection and their transport; use of a transport medium; choice of culture media; interpretation of results.

- Indication of a serological typing or by other methods (PAGE, etc.) of the isolates especially of *Ureaplasma* strains.
- Indication and methodology of a serological diagnostic.

As a general methodology it was concluded that:

1. In *respiratory diseases* it should be preferred to give emphasis to serological diagnosis of *Mycoplasma pneumoniae* by CF test. It is however recommended to perform isolation attempts in newborns and in infants (as well as simultaneous isolation attempts of *Chlamydia*) because of the difficulty of getting early clear cut serological results in such very young children and because of the possibility of pulmonary infection with other types of *Mycoplasmas*.

2. In *genital diseases*, the method of choice should be the isolation attempt and it is recommended to include a medium of the PS4 type in the range of media in order to be able to isolate *Mycoplasma genitalium*.

Growth media were considered to be the most adequate transport medium.

In urethritis it is recommended to perform quantitative determinations in urine. It was of the general opinion that serological tests performed either with serum or with secretions were deceiving and of no practical use except in cases of complicated diseases (peritonitis, arthritis, etc.). No serological technique could be advised.

It was believed that *Mycoplasma* and *Ureaplasma* fine differentiation, by serotyping or by PAGE for instance, would possibly give clues on difference in virulence among these agents as well as useful epidemiological informations.

Development in this field was recommended.

The role of *Mycoplasma genitalium* and of *Ureaplasma diversum* in human diseases should be clarified and the search of these fastidious agents is encouraged.

Environmental microbiology

The global nature of the pollution problem has induced research activities on biodegradation in many countries and has stimulated the development of microbial technologies to overcome pollution by persistent compounds. International organizations like the Working Party on Environmental Biotechnology of the European Federation of Biotechnology (EFB) and the United Nations Environmental Programme (UNEP) have become aware of the problem and are developing efforts to coordinate research and development, to improve information exchange, and to work out recommendations for government agencies. It was felt that in view of these activities at an international level, there was a need for information exchange at the national level. The session on environmental microbiology at the annual meeting of the

SGM thus provided representatives of Swiss research laboratories involved in biodegradation research with an opportunity to discuss their activities. Four presentations were devoted to research related to the abatement of pollution caused by point sources, that is by industrial effluents and by effluents from municipal sewage treatment plants, while one contribution served to inform the audience of the activities of the EFB in the field of environmental biotechnology.

Dr A.M. Cook (Institute of Microbiology, ETH Zürich) reported on current research programmes involving the isolation and characterization of pure microbial cultures mineralizing specific problem compounds, the identification of the relevant degradative pathways in such organisms and their use for the development of practical processes for the treatment of chemical waste at its source of production in chemical plants. He stressed the importance of sensitive and reliable analytical techniques to demonstrate quantitative and complete degradation. Pollutants presently under investigation at the ETH Zürich include *s*-triazines in wastewaters from herbicide production, azo dyes and stilbenes used in textile industry and chlorinated C1- and C2-hydrocarbons, which are widely used as solvents and intermediates in chemical syntheses.

Dr J. Zeyer (Département de Biochimie médicale, Université de Genève) reported on the activities of the Geneva group, whose main topic is the use of in vitro genetic techniques for the construction of *Pseudomonas* strains with new catabolic pathways for persistent compounds. Provided basic information on the biochemistry and the genetics of the relevant pathways is available, the in vitro approach offers the advantage of a high level of predictability as compared to the in vivo approaches for the evolution of new catabolic pathways. In the Geneva laboratory gene cloning techniques are being applied to the construction of strains degrading important industrial chemicals like haloaromatics, nitroaromatics and sulfoaromatics.

Dr G. Hamer (Institut für Gewässerschutz und Wassertechnologie, ETH Zürich) presented a project concerned with novel approaches to the denitrification of wastewater. Its goal is the establishment of a mixed culture system in which methane serves as a primary substrate and methanol, on intermediate of methane oxidation is used by *Hyphomicrobia* as substrate for the denitrification step. Since methane oxidation is oxygen-dependent whereas denitrification can be inhibited by oxygen, such a system is difficult to achieve. Dr Hamer presented data on a *Hyphomicrobium* isolate that, under defined culture conditions, denitrified in the presence of oxygen and, therefore, may be promising for use in the mixed culture system envisaged.

Dr O. Ghisalba (Ciba-Geigy AG, Basel) discussed biodegradation processes as alternatives to methods