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Société Suisse de Microbiologie *Comptes rendus de la 43^{e} réunion annuelle*

Società Svizzera di Microbiologia *Rendiconti della 43^{a} sessione annuale*

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The Society Prize 1984

The Society Prize has been allocated to Dr Elena Buetti, Swiss Institute for Experimental Cancer Research, CH-1066 Epalinges sur Lausanne, Switzerland

Main Lectures

Prof. Dr H. H. Mollaret, Bacterial Ecology Unit, Pasteur Institute, Paris: Human activity and infectious disease.
PD Dr A. Degrémont, Swiss Tropical Institute, Basel: Imported diseases in Switzerland.
Dr F. Speiser, Swiss Tropical Institute, Basel: Serodiagnosis of parasitic diseases.

Round Table Discussions

Microbiological indicators of pollution
Dr J. S. Slade, Thames Water Authority, London/GB
Dr C. Breer, Institute of Clinical Microbiology and Immunology, St. Gallen/Switzerland
Dr H. Züllig, Appar. Wasserwirtschaft, Rheineck/Switzerland
Prof. Dr G. Turian, Laboratory of General Microbiology, University of Geneva/Switzerland

The Society Prize

Homologous and heterologous promoters require different extents of MMTV upstream sequences for transcriptional stimulation by glucocorticoids

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Transcription of mouse mammary tumor virus in tissue culture can be stimulated 10- to 100-fold by the addition of glucocorticoid hormones to the culture medium. We have been studying the portions for MMTV genome that are responsible for this regulation, presumably through an interaction between hormone-receptor complexes and viral DNA sequences. In transfection experiments using chimaeric DNA molecules in which the coding sequence of the herpes simplex thymidine kinase (tk) gene was under the transcriptional control of MMTV we demonstrated that MMTV DNA sequences between −105 and −204 bp upstream of the initiation site of viral transcription are required for the glucocorticoid stimulation (EMBO J. *2* (1983) 1423). These data were based on quantitative S1 mapping with cytoplasmic, steady-state RNA from stably transfected Ltk^{+} cell lines grown with or without dexamethasone addition.
Using the method of elongation in isolated nuclei of nascent RNA chains initiated in vivo, we found that the number of active RNA polymerase II molecules on MMTV DNA increased to the same extent as the specific mRNA level, and could account entirely for the hormonal effect on MMTV transcription. Moreover, this increase in polymerase loading required upstream sequences to −204, while a deletion to −149 abolished any stimulation above a constitutive level of transcription, in agreement with our previous results with stable RNA.
To test the ability of these sequences to confer glucocorticoid responsiveness to a heterologous, normally non-regulated promoter, we joined MMTV DNA usptream of −108 to the tk promoter (at −197 or −79 from the tk cap site). While fusions at −79 gave mostly aberrant transcripts in transfected cells, fusions at −197 produced correctly initiated tk transcripts. In this case, however, MMTV sequences between −108 and −204 were not sufficient for a glucocorticoid stimulation.

Main Lectures

Human activity and infectious disease

H. H. Mollaret
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In any study of an infectious disease, one has to distinguish between its epidemiology, on the one hand, and its 'natural history', on the other. The epidemiology of a disease is a study of its evolution through the ages; the fluctuations in its distribution, and its spread into other parts of the world, as far as documents of greater or lesser antiquity allow us to trace its movements in time and space. Its 'natural history' ist the study of such factors as the identity of the causal agent; its epidemiology; its reservoir or reservoirs; the way in which the agent circulates and is eventually released into the external environment; its adaptation to one or several species, and so on.

As a living entity, the infectious disease is more dependent on human activity than any other. Schematically, one can divide this activity into two categories. On the one hand, mankind has searched for ways to fight against infectious diseases by the study of their causal agents, by research into methods of treatment, and by prophylaxis, which may be individual (vaccination) or collective (improvements in sanitation, eradication of vectors or of animal species which act as reservoirs, etc.). The activity in question is, of course, beneficial to the human species, and it can have very striking results, like the retreat of malaria in Europe, the control of yellow fever, and the eradication of smallpox.

But, on the other hand, we are forced to recognize that human activity since the dawn of time has never ceased to work in various ways on behalf of the infectious diseases unconsciously, involuntarily but very effectively. First and foremost, we have constantly extended their area of distribution, by taking them on journeys and placing more and more rapid means of transport at their disposal. Plague provides one of the clearest examples; its 'natural history' can be summarized as the transfer of a bacterium by a flea from an infected rodent to a healthy rodent or to a human being. Limited by these conditions, even under the most favorable circumstances the disease could hardly have travelled more than a few kilometers, and could never have crossed the oceans. But the history of the plague shows us that man, and he alone, has made it possible for the disease to invade the world by offering it new and faster means of transport; at first he transported infected fleas or rodents only as fast as he could walk, but later at the speed of his transport animals; finally, sailing ships were put at the disposal of the plague – they were still slow, but they were followed by steamships and finally aeroplanes. The history of cholera shows how the destiny of the Vibrio bacterium is linked exclusively with the movements of human beings; it benefited first from railways and river-routes, and finally from air transport, which has dominated the present pandemic. The history of yellow fever, that of syphilis, according to the 'Columbus theory', and that of the leptospiroses, show how man has involuntarily provided the necessary carrier from one continent to another.

The transformation of the landscape, particularly as a result of deforestation, has gradually changed the original 'closed' environment, the forest, into an 'open' countryside, and this has modified the activities of predators; the history of rabies in Europe is correlated with large-scale deforestation. In Africa, irrigation schemes involving the construction of large dams have provided malaria and bilharzia with every opportunity for causing epidemics. A study of the relationships between man and other animals shows how far man, in satisfying his many needs – for example for food, energy and emotional satisfaction – has transformed localized infections into world-wide ones; brucellosis, melioidosis, leishmaniasis, tuberculosis.

Changes in human habits – even very minor ones – can cause a profound disturbance in the relationship between man-and-infectious agent or man-and-vector; for instance, the parallel decrease in Europe of both plague and typhus may be linked to general increase in the habit of removing one's daytime clothes during the night, thus impeding the reproductive cycles of the ectoparasite vectors. The attitude of man to water, his habitat, and urbanization have determined the evolution and epidemiology of salmonellosis, leptospirosis, viral hepatitis and poliomyelitis. We have shown how the appearance of infection with *Yersinia enterocolitica* could be connected with some recent modifications in dietary habits; changes in the composition of menus, the general use of domestic refrigerators, and the provision of meals on a large scale. The 'Legionaires' Disease' is another example of a 'new' disease caused by 'old' bacteria; by modifying his habits – often only slightly – man comes into contact with species of bacteria or viruses from which his previous mode of life had protected him.

As he gains access to more and remote territories, man gains access at the same time to reservoirs of infectious agents which he has never reached before, thus liberating, for example, the Marburg, Lassa and Eboli viruses. By modifying his internal environment for therapeutic purposes (e.g. transplants), or by upsetting his bacterial flora completely by a badly-conducted antibiotic therapy, man turns previously inoffensive organisms into opportunists. By his activities, by the development of new habits, indeed by his very existence, man modifies his relationship with microorganisms, and thus transforms their ecology, completely changes their destiny and, at the same time, that of the diseases they transmit.

Imported diseases in Switzerland

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It is not possible to have a precise idea of the real frequency of imported diseases in Switzerland. The statistics of the Swiss Tropical Institute (STI) show a steady rise of malaria cases, but since 1980 also a stagnancy of the number of other diseases.

Giardiasis and intestinal worms are most frequently observed. But it is malaria, hepatitis and acute diarrhea that preoccupy patients and doctors most. Some of these diseases present epidemiological and clinical characteristics that are misleading for the doctor.

For the correct management of the laboratory examinations, which are often the only means to make a reliable diagnosis, a good anamnesis is indispensable! In this field it is therefore essential that appropriate methods be used by a qualified and experienced staff. Thus, a certain centralization on the level of laboratory work is required.

Some tests, especially serodiagnostic tests, do not have a sensitiveness and a specifity of 100% and the discovery of a parasite does not always explain the symptoms observed with the patient. It is therefore important that the