

RHEOLOGY, BIOCHEMISTRY AND FUNCTIONS OF MUCUS
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INAUGURAL ADDRESS AND ABSTRACTS

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It is a great honour and a great pleasure for me to open, in Reims, on March 12th 1987, this INSERM Seminar devoted to "**Rheology, Biochemistry and the Functions of Mucus**". I would like to welcome all the numerous personalities who are attending this meeting and extend particular greetings to Professor Alex SILBERBERG whose fundamental and pioneer work in mucus rheology and particularly in mucus glycoproteins structure, has encouraged so many researchers to follow his steps. This Seminar is sponsored by the French "National Institute of Health and Medical Research" (INSERM), by the French Societies of Biorheology and Pneumology. I am delighted to welcome their respective Presidents : Professor J.F. STOLTZ and Professor C. VOISIN. I would like also to thank the University of Reims and SYNHELABO FRANCE, who have contributed to the organization of this Seminar.

This International Seminar aims at gathering biochemists and biophysicists specialized in the glycoprotein structure and in the rheological properties of mucus as well as biologists, pharmacologists and clinicians of various specializations (pneumology, oto-rhinolaryngology, gastroenterology and gynaecology) who are interested in the relationships existing between Rheology, Biochemistry and the Functions of mucus as well as in the methods used to analyze and characterize the mucus collected from different origins. The diversity of the medical branches concerned by this Seminar is relevant to the marked interdisciplinary approaches of Biorheology.

Mucus is an ubiquitous found biopolymer, which, as a gel, fulfils lots of different roles, adapted to their specific biological environment. For example, respiratory mucus possesses the capacity to trap microorganisms or exogenous particules and transport them out of the respiratory tract whereas gastro-duodenal mucus has for main function to protect mucosa from the intraluminal aggressive factors. Otherwise, the changes of the rheology of cervical mucus during the menstrual cycle control the passage of sperm and therefore cervical mucus rheology is an important factor in the fertility problem.

Such different functions require different rheological properties that we have not yet identified. In 1972, Professor Paul SADOUL had, at that time the temerity or we should rather say 15 years later, the perspicacity to devote the 9th international "Entretiens" of Respiratory Physiopathology to the "Rheology of airway secretions and respiratory functions" (1). He was one of the first scientists to promote the idea that rheological properties of respiratory mucus could be responsible for abnormalities in the respiratory gas exchange and mucociliary clearance. This concept was rapidly confirmed as actual and to quote A. SILBERBERG (2) "Mucus, as a gel of altered character, can correspondingly be associated with a failure of function, i.e. with cellular malfunction and with disease".

The scientific programme of this Seminar has been divided into three main parts : 1. The biochemical structure of bronchial, cervical and gastroduodenal mucus, 2. The rheological behaviour and the modelling of mucus and 3. The analysis of the relationships existing between the rheological and functional properties of various types of mucus.

Finally, a Round Table will be devoted to the methods used to collect mucus and measure a simple rheological index : the spinability. I hope that the presentations and following discussions will increase our knowledge on mucus rheology and will encourage further researchs in this field.

REFERENCES

1. PUCHELLE, E. Rheology of bronchial secretions and respiratory function. Paris, Masson Publ., 1973, 487 pp.
2. SILBERBERG, A. Introduction. In: Mucus and Mucosa, Ciba Foundation Symposium, 109, 1984, pp 1-3.

The Abstracts are presented in four sections:

- I. Biochemical Structure of Mucus - A. Silberberg, P. Roussel, A. Allen, E. Chantler (I-1 to I-4)
- II. Rheological Behaviour and Modelling of Mucus - J.C. Lelievre, D. Quemada (II-5 to II to 6)
- III. Rheology and Mucus Functions - E. Puchelle, M. King, S. Brofeldt, C. Motta, J.M. Zahm, L.A. Sellers, L. Lichtenberger, R. Ramphal, B. Volochine, F. Chretien (III-7 to III-16)
- IV. Roundtable: Methods for Collecting Mucus and Measurement of Mucus Spinability - S. Brofeldt, J.M. Zahm, M. Azad, J.C. Puchelle, J. Gonzales (IV-17 to IV-21)