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# WHO EXPERT COMMITTEE ON BIOLOGICAL STANDARDIZATION

## Twentieth Report

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## WHO EXPERT COMMITTEE ON BIOLOGICAL STANDARDIZATION

*Geneva, 25-30 September 1967*

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## Twentieth Report

The WHO Expert Committee on Biological Standardization met in Geneva from 25 to 30 September 1967. Dr P. Dorolle, Deputy Director-General, on behalf of the Director-General, welcomed the members of the Committee. He also welcomed the representative of the Food and Agriculture Organization of the United Nations.

He recalled that the Expert Committee on Biological Standardization had been first convened by the Interim Commission and it was, therefore, among the oldest Committees of the Organization. The agenda this year included a number of pharmacological substances (antibiotics and hormones) as well as immunological substances (antigens and antibodies). Many of the latter were primarily of veterinary interest, an indication of the growing importance of substances used in veterinary medicine. This is also reflected in the increasing amount of work handled by the third International Laboratory for Biological Standards. He mentioned that, in recent years, the field of biological standardization had been expanding in a number of directions of interest to clinical diagnosis and research. There were perhaps several substances intended for such purposes that were not characteristic of those traditionally associated with this Committee. He emphasized that the work of the Committee in those areas should be related to the developing programme of work of WHO, which would continue to make available to Member States whatever facilities and services it could provide. National institutions would, however, have to be depended upon to make the necessary studies preliminary to the work being continued under the auspices of this Expert Committee.

As in previous years, the Committee would also be asked to examine certain sets of requirements for biological substances, drafted by the WHO Secretariat, from the point of view of their suitability for international use, i.e., to help countries to ensure the efficacy and safety of these biological substances when used in prophylaxis and therapy.

## GENERAL

The Committee considered some general questions relating to the standardization of certain hormones.[1] A number of new and urgent problems have arisen in connexion with recent developments in endocrinology. The application of techniques of radioimmunoassay, several orders of magnitude more sensitive than most current bioassays, makes possible the detection and measurement of protein and polypeptide hormones in human plasma and body fluids. These methods offer for the first time an opportunity for studies of certain at present very poorly understood aspects of the regulation of metabolism, the physiology of growth and, especially, the physiology of reproduction in man. Applications in animal husbandry, of importance to world economy and to human nutrition and health, are also foreseeable. The feasibility of the methods has been adequately demonstrated and a large international interest exists. The rate of work is limited, however, not only by certain difficulties in obtaining suitable materials for general use, but also by the lack of international standards for use in immunoassays. Such standards would improve the comparability of the results of assays of the hormones obtained in different laboratories. The provision of suitable standards, however, poses certain problems, peculiar to the field of hormones.

The technique of immunoassay involves a method for estimating hormones in which specific antigen-antibody interactions not previously used for the assay of these substances are paramount. It is not yet clear how measurements of hormone antigen are to be related to biological activity. Although where highly purified hormones are used, a systematic correlation between the results of biological assays and immunoassays might be expected, this is not necessarily so when, for reasons of stability or scarcity, less pure materials must be employed. Because of these difficulties, a standard for a hormone antigen for use in immunoassay may be essential in order to reduce the variation of estimates of the same test materials in different laboratories. The collaborative assay for the establishment of such an antigen standard should be designed to demonstrate fulfilment of this purpose.

Since the process in immunoassay is essentially the reaction between a specific antibody and its antigen, what is estimated is the amount of immunoreactive material present in the unknown sample. The antigen standard for such an assay should resemble as nearly as possible the native hormone. Ideally, where the standard is a very highly purified preparation, the results can be expressed in terms of weight of the antigen standard per unit volume of sample, or in terms of defined international units. Either method suffices because it provides a figure that is correlated with biological activity,

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1 Unpublished working document WHO/DS/67.806