Meeting Report

PROTEINASES IN MAMMALIAN TISSUES AND CELLS

FEBS Advanced Course No. 74

Peter BOHLEY

Physiologisch-chemisches Institut, Martin-Luther-Universität, DDR 402 Halle (Saale), POB 184, GDR

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The course was organized on behalf of FEBS by the proteolysis group in Halle (H. Kirschke, J. Langner, S. Riemann, B. Wiederanders and P. Bohley) from July 20th–24th, 1981, in the Institute of Physiological Chemistry of the Martin Luther University.

It was started with a contribution of A. J. Barrett (Cambridge) on classification and nomenclature of *endopeptidases*. For this, new principles have had to be developed: the four sub-sub-classes are distinguished by the identity of their primary catalytic residues as serine-, cysteine-, aspartic- and metalloproteinases. This allows us to bring together enzymes which are evolutionary related, and structurally homologous [1–13].

The use of *protein substrates* to determine proteolytic activities was described by P. Bohley and J. Langner (Halle), stressing especially the importance of natural substrate proteins but also the use of artificial proteins and the different methods to measure the increase of split products or the decrease of substrate proteins [3–5,8–13]. *Synthetic substrates* of proteinases are usually easier to determine and are in many cases more specific, as was shown in detail in the lectures of A. J. Barrett (Cambridge) and V. M. Stepanov (Moscow).

In his review of mammalian *exopeptidases* J. Ken McDonald (Charleston) gave a comprehensive survey on this field covering localization and identification of exopeptidases acting on the N-terminus and on the the C-terminus. In the practical part he showed different assays of exopeptidases. A. J. Kenny (Leeds) reported on *membrane peptidases*, in particular on microvillar peptidases, their concerted attack on oligopeptides, their molecular properties, some special problems in their solubilization and the differences between detergent- and proteinase-forms of these enzymes [3–6,11–13]. In the practical part he demonstrated together with M. Danielsen and G. Cowell the application of immunological methods to the study of kidney microvillar membrane peptidases.

J. Lasch and G. Fischer (Halle) described practical enzyme *kinetics* with special emphasis on the problems with proteolytic enzymes and demonstrated in the practical part the measurement of the pre-steady-state phase of a serine peptidase and the evaluation of steady-state kinetic parameters of leucine aminopeptidase.

A. J. Barrett (Cambridge) and H. Kirschke (Halle) reported on synthetic *inhibitors* of proteinases and demonstrated the use of low molecular mass substrates (amides, naphtylamides, methylcoumaryl amides) and inhibitors (leupeptin, Z–Phe–Phe–diazomethane, Epoxide-64, pepstatin and others) for classification and the time dependence of reactions with the inhibitors and the cathepsins B, D, H and L and with papain [12].

B. Wiederanders (Halle) and A. J. Barrett summarized the criteria for *purity* of enzymes and demonstrated the staining of gels for cysteine proteinase activity.

Again, A. J. Barrett reviewed carefully the important field of protein inhibitors and finally lectures of H. Glaumann (Huddinge) on intracellular proteolytic events with special emphasis on autophagy and heterophagy and of J. Langner and P. Bohley on organization, pathways and selectivity of intracellular protein catabolism followed [8–13].

Additionally, in the practical part was the possibility to test one's own samples (using: azocasein; ^{125}I-labelled casein; ^{3}H- and ^{14}C-labelled cytosol proteins; gel electrophoresis) which was used by many of the 40 participants with success.

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Concluding poster discussions showed that most participants were well-experienced in the field of mammalian proteinases. Summaries of these posters and of the lectures and detailed descriptions of the experimental part of the course are collected in a 180-page booklet [14].

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