

PROCEEDINGS

**5th Nordic Meeting on  
MEDICAL AND  
BIOLOGICAL  
ENGINEERING**

June 10-13, 1981 • Linköping, Sweden

25th ANNIVERSARY OF THE SWEDISH  
SOCIETY FOR MEDICAL  
PHYSICS AND MEDICAL ENGINEERING

June 15-17, 1981, Umeå, Sweden

Volume 1

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*5th Nordic Meeting on*  
**MEDICAL AND BIOLOGICAL ENGINEERING**

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Regional Meeting of IFMBE  
(International Federation for Medical and Biological Engineering)  
8th "Over the water" Meeting of BES  
(Biological Engineering Society, UK)  
Linköping, Sweden, June 10-13, 1981

25th ANNIVERSARY OF THE SWEDISH SOCIETY  
FOR MEDICAL PHYSICS AND MEDICAL ENGINEERING  
Umeå, Sweden, June 15-17, 1981

Edited by

P. Åke Öberg  
Erik Odeblad  
Jan Persson  
Ove Wigertz  
Roland Lindvall (secr)  
Torsten Tenland (secr)

*Distributed by*  
*Department of Biomedical Engineering, Linköping University*  
*S-581 85 Linköping, Sweden*

# PREFACE

We feel it an honour to arrange the Fifth Meeting in Sweden and, in particular, at Linköping in the series of Nordic Meetings on Medical and Biological Engineering. The meeting is being organized by the Swedish Society for Medical Physics and Medical Engineering and the Department of Biomedical Engineering, Linköping Institute of Technology, in cooperation with the Biological Engineering Society (BES), UK. It is a regional meeting of the International Federation for Medical and Biological Engineering (IFMBE) held under the auspices of the Nordic Committee on Biomedical Engineering.

The previous meetings have contributed substantially to the development of our scientific field in the Nordic countries. The series of meetings has also built up collaboration between organizations and facilitated the exchange of scientific information. The increasingly close relations between the biomedical engineers of the Nordic countries and their British colleagues are emphasized by the fact that this meeting is a joint meeting between the Nordic societies and BES. This cooperation will further improve the scientific outcome of our meeting.

Biomedical engineering in Sweden was recognized as an academic discipline in its own right in the early fifties, when Professor Henry Wallman introduced courses in this field at Chalmers University of Technology, Gothenburg. The need for biomedical engineers in the country is at present met by educational programs given in Gothenburg, Stockholm and Linköping. In 1956, the Swedish Society for Medical Physics and Medical Engineering was founded as a national society for the promotion of this branch of science. In conjunction with the Linköping meeting, the 25th anniversary of the Swedish Society is being celebrated at a meeting on biophysics in Umeå, the contributions of which are to be found in the last section of these Proceedings. From the very beginning the Swedish Society constituted a cross-section of the Swedish Society of Medical Sciences, thus indicating the remarkably good cooperation between physicians and engineers in the country.

The Swedish Society for Medical Physics and Medical Engineering gratefully acknowledges the most valuable financial support given by NORDFORSK and by the National Swedish Board for Technical Development. Sincere thanks are due to Linköping University and Institute of Technology, who are acting as host for the Meeting.

As organizers, we were happy to receive a large number of submissions of high scientific quality, not only from the Nordic countries but also from European and other countries. Warmest thanks are given to all contributors, to the cooperating and supporting societies BES and IFMBE and to all those working with planning and running the meeting, thus contributing to its success.

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