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## Preface for a Discussion on Near-infrared spectroscopy and imaging of living systems

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## PREFACE

Near-infrared spectroscopy enables non-invasive observations to be made of important indices of tissue oxygenation and haemodynamics, including oxyhaemoglobin, deoxyhaemoglobin, and oxidized cytochrome-*c* oxidase. Methods have been devised for the measurement of blood flow and volume which have been particularly applied to studies of the human neonatal brain. Techniques for imaging with near-infrared light have also been described.

During the past few years very rapid developments have taken place in establishing the theoretical basis for near-infrared spectroscopy and imaging, in designing new instrumentation, and in the application of the technique to the investigation of biological and clinical questions. The purpose of this Discussion Meeting was to bring together the leaders in the field from the disciplines involved, ranging from basic physics to clinical medicine, so that new knowledge could be shared, basic scientists could inform themselves about the most pressing biological questions that need to be addressed, and biologists could acquire a better understanding of the interaction of near-infrared light with tissue, and of the difficulties inherent in interpreting some of the data.

The presentations and discussions covered methods of quantitation of spectroscopic data, and their application to the measurement of indices of tissue oxygenation including mitochondrial energetics. Their use was described for the investigation of events in the human foetal, neonatal and adult brain, and for assessing tissue variability for the transplantation of organs. The mathematical and theoretical basis of image reconstruction was discussed, and illustrations of images were shown. The use of both spectroscopy and imaging for testing cerebrally-evoked responses was also described.

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