In 1772 in Uppsala the Swedish chemist Karl Wilhelm Scheele discovered the element Oxygen. Two hundred and one years later, in 1973, the International Society on Oxygen Transport to Tissue (ISOTT) was founded. Since then there has been an annual ISOTT meeting. After 24 years of international ISOTT meetings it was decided, at the 2005 summit in Bari, Italy, that the 2007 meeting was to be held in Uppsala, Sweden. Thus, after the Louisville meeting we, in the Uppsala group, withdrew to the Edgewater Resort at Taylorsville Lake outside Louisville and prepared the Uppsala ISOTT meeting by tasting Clare E. Elwell Terence S. Leung David K. Harrison Editors. Oxygen Transport to Tissue XXXVII. Advances in Experimental Medicine and Biology. Volume 876. The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. Printed on acid-free paper Springer Science+Business Media LLC New York is part of Springer Science+Business Media (www.springer.com). Preface. This book contains the refereed contributions from the 42nd annual meeting of ISOTT. The annual meetings of ISOTT bring together scientists from various fields (medicine, physiology, mathematics, biology). This vivid interaction is the main motivation for members to participate and gain new ideas and knowledge in the broad field of oxygen transport to tissue. This book contains the refereed contributions from the 42nd annual meeting of ISOTT. The annual meetings of ISOTT bring together scientists from various fields (medicine, physiology, mathematics, biology). This vivid interaction is the main motivation for members to participate and gain new ideas and knowledge in the broad field of oxygen transport to tissue. The papers in this volume summarize some of the outstanding contributions from the 42nd annual meeting, which included sessions on: cellular hypoxia and mitochondria; blood substitutes and oxygen therapeutics; oxygen transport in critical care medicine and disease; muscle oxygenation; multi modal imaging techniques; brain oxygenation and imaging; optical techniques for oxygen measurement; microcirculation; mathematical modelling of oxygen t...