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Preface

This book is the result of the 39th Nestlé Nutrition Workshop which was held at Ashdown Park Hotel in East Sussex, United Kingdom, in the spring of 1996. International experts in placental function and fetal nutrition were invited to discuss their work. The experts included basic scientists and clinical scientists. Ashdown Park provided a magnificent setting for a conference, one which encouraged informal discussion apart from the formal program.

The topic of placental function and fetal nutrition is an extremely important and timely one. The development and growth of a child is determined to a great extent by its in utero development. Fetal growth restriction, or intrauterine growth retardation, is a striking example of clinical pathology associated with placental dysfunction and fetal malnutrition. It is now clear that such effects can have long-term implications. The timeliness of this Workshop comes from the availability of new imaging and research techniques, which permit studies in human pregnancy as well as in basic research.

The conference had five sessions, in each of which a mixture of basic and clinical research topics was presented. This format led to lively exchange and discussion among basic scientists and clinicians. It was quickly apparent that a great deal of progress had been made towards understanding placental transport and metabolism and that some of the concepts which have emerged from basic research are now addressable in human pregnancies.

While many questions remain unanswered, it was clear that a far more precise description of normal fetal growth and metabolism is emerging, with the possibility of exploring how specific maternal diseases affect fetal and placental nutrition. Within the lively discussion that followed all presentations, there were suggestions with potential therapeutic application to human pregnancies.

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Foreword

The placenta plays a central role in the nutrition of the fetus. It provides nutrients and removes waste products. Placental size and structure, developmental and pathological processes, as well as metabolic interactions with the fetus, cooperate with placental transport and metabolic mechanisms to affect placental-fetal nutrient exchange both quantitatively and qualitatively. It is generally accepted that small placental size is the major determinant of intrauterine growth retardation (IUGR) in infants. Even though placental glucose transfer appears to be unchanged in IUGR it remains unclear whether the efficiency of placental amino acids transport is altered. Lipid transport, placental hormone production, polypeptide growth factors, and signals originating from the fetus can also limit fetal growth.

The 39th Nestlé Nutrition Workshop, held in Ashdown Park, Sussex, United Kingdom and chaired by Professor F. Battaglia, allowed an interactive discussion between basic and clinically applied research in this field. It provided an opportunity not only to digest the progress made in our understanding of placental function and fetal nutrition, but also to outline the important questions for the future; among them, the prevention of IUGR and the nutritional requirements of the newborn with IUGR.

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