

Embryo culture media, culture techniques and embryo selection: a tribute to Wesley Kingston Whitten

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Abstrak

This review article gives a brief history of the classical experiments that led to the development of the embryo culture medium and in vitro embryo culture. It proposes that, in view of the outstanding and significant pioneering contributions of Wesley Kingston Whitten to the development of embryo culture medium, he be considered the “Father of Embryo Culture Medium”. Furthermore, it describes the nutritional requirements of early embryos and how these requirements with specific references to carbohydrates, amino acids, phosphates, growth factors, etc, have been utilized to formulate increasingly more complex embryo culture media. This has led to the development of progressively more efficacious embryo culture media including the formulation of completely defined and synthetic protein-free embryo culture medium. The review also describes physical factors, growth factors, insemination methods for the fertilization of oocytes and culture methods affecting embryo growth, development, metabolism, oxygen embryotoxicity and survival. In procedural terms, the review also summarizes the evolution of embryo culture techniques from tube culture to, microdrop culture under oil to co-culture to ultra microdrop culture techniques. It includes techniques of in vitro maturation and for the selection of potentially viable embryos of various developmental stages.