The main task of the endothelial cells (EC) is the communication between various cells of different organs (including vital organs) and the circulating blood with its cellular components. To perform their task, the EC are able to form a barrier against molecular and cellular components and thus provide a highly specific permeability (Machovitch, 1988).

The properties of the EC (e.g. metabolic functions) are so varied that we may refer to them as a vascular organ, which is a target cell of many mediators during hemorrhagic and traumatic shock, as well as sepsis. The EC are thus involved in the development of microvascular dysfunction. This dysfunction as well as the endothelial cell damage may lead to the "organ in shock", to organ failure and the organ failure syndrome, which may terminate as multiorgan failure (Fig. 1). Aside from the endothelium, organ-specific cells are involved, which eventually constitute the pre-requisite for subsequent organ failure.

A. PHYSIOLOGY OF ENDOTHELIAL CELLS (EC)

1. Barrier and transport function of the endothelium

The EC possess three important surfaces: a non-thrombogenic surface, which is directly exposed to the circulating blood (luminal surface); a surface which is attached to the basement membrane and to pericytes
Figure 1. Schematic representation of the sequence of events leading to multiorgan failure.