



Review

The past, the present and the future of experimental research on myocardial ischemia and protection

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Abstract:

At present, cardiovascular diseases represent the most important health risks because they are responsible for more than 50% of total mortality. Among them, ischemic heart disease is the leading cause of morbidity and mortality, and according to the World Health Organization, will be the major global cause of death by the year 2020. Major progress in the prognosis, diagnosis and therapy of ischemic heart disease would be impossible without notable achievements of the 20th century that have been critical for further development of cardiology. We are now living in the era of molecular medicine, and the influence of basic research on clinical practice has never been more pronounced. This, however, necessitates a new strategy; future cardiovascular research should include the following general guidelines: 1) to evaluate the role and proportion of already described molecular pathways; descriptive approaches will gradually disappear; 2) to distinguish between acute, chronic and pleiotropic effects of different drugs under *in vitro* and *in vivo* conditions, with respect to possible clinical use; 3) to use clinically relevant genetic models; 4) to study possible alterations in intracellular signaling in order to find the decisive steps responsible for abnormal control of cell growth, contractile function, lipid metabolism, cardiac ischemic tolerance, etc.; 5) to study the molecular mechanisms of cardiovascular diseases not only in healthy individuals, but also under different pathological conditions.

Such an approach must include developmental and gender differences, which are particularly important for the field of ischemic heart disease; therefore, experimental cardiovascular research can no longer be restricted to males of uncertain age. It is hoped that patients in future decades will profit from the progress of basic cardiovascular research.

Key words:

myocardial ischemia, protection, cell death, reperfusion
