

## Preface

Undisturbed reproduction is dependent on the complex and integrated regulatory system, thus investigation of multiple regulatory mechanisms controlling reproductive processes is of great importance. The recognition of these processes on various levels in respect to, e.g. gonadal differentiation, fertilization, embryonic, fetal and postnatal development, gives a stimulus for designing new techniques which will contribute to the improvement of the reproductive biotechnology including embryonic engineering, genomic and proteomics etc. The results of these studies give a basis for present and future advancement in genetics and animal production. They will also help to eliminate reproductive disturbances of low fertility specimens as well as negative factors, including environment, impairing successful reproduction. To protect animals' biodiversity, research on regulatory mechanisms of reproduction of undomesticated animals is especially important and worth supporting.

To carry out investigation of all presented topics of animal reproduction, the interdisciplinary group of specialists was invited to write an integrated research proposal on: *Biotechnological and physiological for improvement of animal reproductive processes in normal and abnormal environmental conditions* (PBZ-KBN-084/PO6/2002).

The project, financed by the Committee for Scientific Research, comprised 6 research areas:

1. Genetic basis of gonadal differentiation, regulation of gamete function, embryo development and genetic markers of reproductive traits.
2. The role of some selected hormones in the male reproductive system of various animals.
3. Mechanisms facilitating optimal conditions for implantation and development of pig embryo.

4. Complex biotechnological methods in embryonic engineering of some utilized animals.
5. Interaction of molecular mechanisms of unfavourable environmental conditions.
6. Biotechnological aspects in regulation of reproduction in non-domesticated animals.

The research areas were implemented by scientific team from the Institutions of Higher Education and Polish Academy of Sciences, and Resort Institutions. This special issue in Reproductive Biology is compiled of 15 reviews, with a synthesis of results of investigations carried out under the project. The special contributions from authors, the participants of the project, have covered new research themes augmented by worldwide literature.

The research outcomes presented in this issue have made significant advances in new developments in methodology, which are unquestionable successes of the Polish Scientific Institutions in the field of biology of animal reproduction.

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