

# Preface

The book is given over to study of nature of abnormally low friction and wear of human and animal joints. Trends in joint function and lubrication, possibilities of rheological correction and cartilage mechanodestruction prophylaxis during arthropathies are generalized.

The complex researches of cartilage friction process in natural and artificial lubricants that lead to breakthrough understanding of joint boundary lubrication nature take a large part of the book. It has been proved that liquid-crystal state of synovial fluid, such as cholesteric-nematic crystals, plays an essential role in intra-articular friction decrease. The results of this discovery have fundamental and applied meaning. They greatly expand up-to-date understanding of the role of liquid crystal in biological tribosystem function and expose a completely new trend of joint lubrication properties research.

Creation of novel pharmaceuticals—artificial synovial fluid reproducing lubrication mechanism inherent to natural synovia—a new and important balance of the work.

Experimental and clinical data on chondroprotective efficiency of preparation are of practical interest for further research in the field. It should be noted that only a combination of biological, technical, physical, chemical and medical knowledge makes it possible to investigate the lubrication mechanism of joint cartilage and the prophylaxis methods of premature wear.

The book should be of interest to communities of scientific workers, practitioners and students of medicobiological and technical specialties. It will draw the attention of researches to problems of biotribology, chondroprotection, liquid-crystal biological environment function and creation high-performance materials for endoprosthetics.

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Liquid Crystals in Biotribology

Synovial Joint Treatment

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