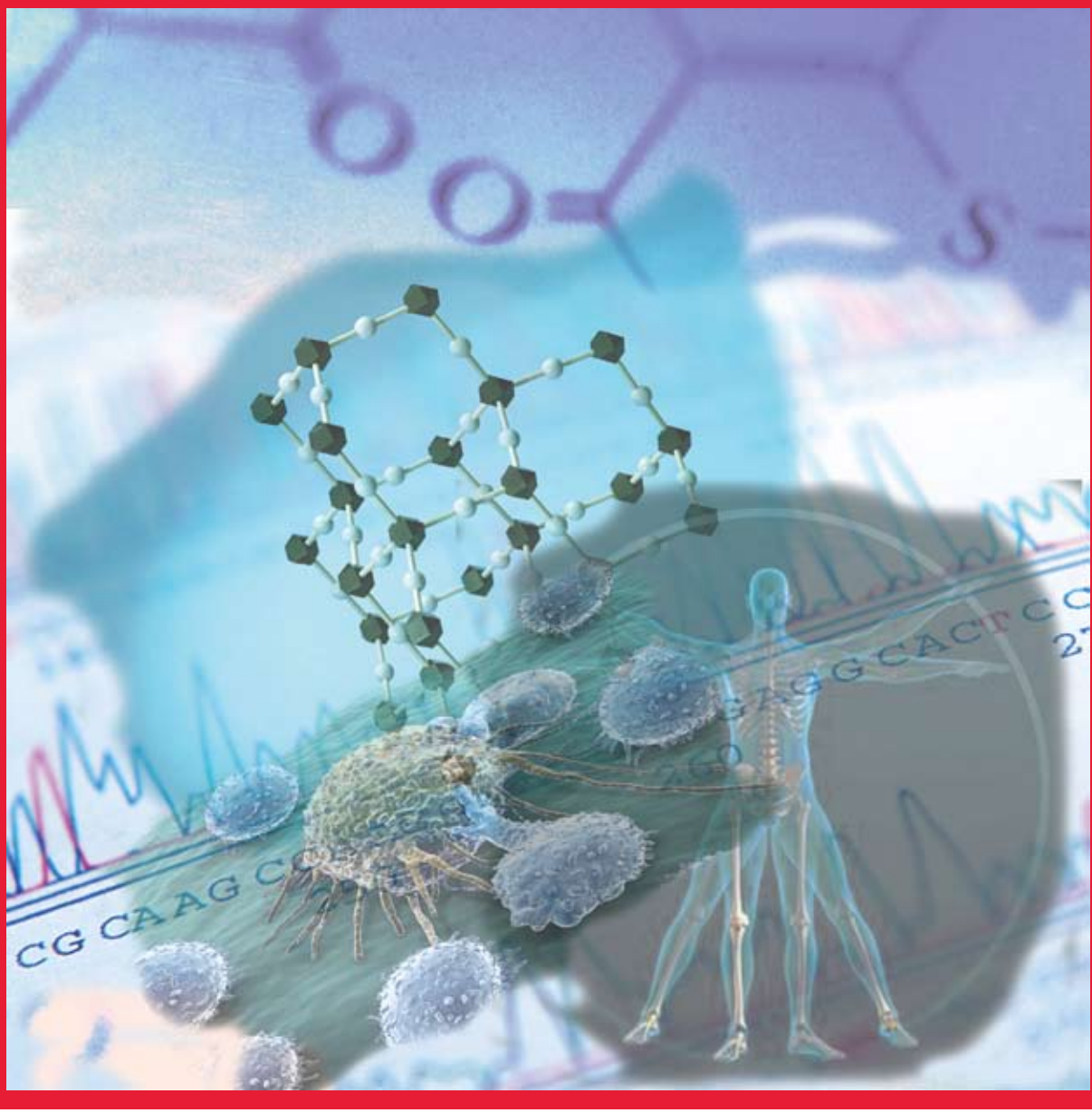
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Chemistry and biomedicine: diversity and unity of goals

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Chemistry and biomedicine: diversity and unity of goals

The last decades are characterized by active integration of biology and chemistry and vigorous development of the molecular (physicochemical) biology. Moreover, further breakthroughs in the knowledge of the fundamental features of functioning of biomolecules, cells and whole organisms should be expected in the near years and decades. The progress in the struggle for human health also relies on this research area, which provides new perfect tools for diagnosis and treatment of diverse and more and more complex diseases and new fields of biomedicine based on the latest achievements of the genetic and cell engineering, genome analysis and immunological methods. Although the traditional methods of synthetic chemistry still hold an important place in the development and advancement of new medical drugs, the present issue of Russian Chemical Reviews is mainly devoted to biological aspects of medicine.

The issue starts with the review by Corresponding Member of the RAS S M Deyev, E N Lebedenko, L E Petrovskaya, D A Dolgikh, Corresponding Member of the RAS A G Gabibov and Academician of the RAS M P Kirpichnikov devoted to man-made antibodies and immunoconjugates. The authors are widely known in Russia and abroad as leaders of this research area, which is obviously of prime importance, first of all, for molecular diagnostics. However, during the last 10–15 years, the scope of application of these macromolecules has markedly extended, which is mainly analyzed in the review.

The next paper by Yu M Yevdokimov, V I Salyanov, S G Skuridin, E V Shtykova, N G Khlebtsov and E I Kats, although not fully devoted to biomedical applications of the described phenomena, considers an absolutely original approach that can be successfully used (and has already been used) in molecular diagnostics by analysis of nucleic acids-binding compounds. The recent report of Yu M Yevdokimov on this topic presented at the Presidium of the RAS was a great success.

The review of the Corresponding Member of the RAS E S Severin deals with the targeted drug delivery to tumour cells. This problem (when considered more broadly) is important for any field of therapy and is often the limiting factor in the fight against various diseases. In the cancer chemotherapy, the selective drug delivery to the target cells is the key to the successful treatment of a patients, and the critical survey of the proposed approaches will be undoubtedly demanded.

The review by A N Tevyashova, E N Olsufyeva and M N Preobrazhenskaya is concerned with the design principles and methods of synthesis of antibiotics with dual mode of action. Antibiotics have been and still remain the main class of antibacterial agents the significance of which in the fight against a broad range of diseases can hardly be overestimated. The need to create new antibiotics is dictated, first, by the variety of side effects restricting the use of many of them and, second, by the ever increasing number of drug resistant bacterial strains. The authors of the review give a fairly comprehensive account of the most topical problems of the chemistry of antibiotics.

Finally, the review by L N Rogoza and N F Salakhutdinov presents a structure-functional analysis of anti-ulcer agents of various types — H_2-receptor antagonists, proton pump inhibitors and competitive acid blockers. Millions of people suffer from ulcer diseases (first of all, gastro-intestinal ulcers) and analysis of currently used drugs and the agents planned to be used is valuable both for researchers who develop drugs and for practicing doctors.

This is the content of this issue in brief. In the subsequent issues we plan to publish reviews covering other topics of biomedical science, which, in our opinion, will find their readers.

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