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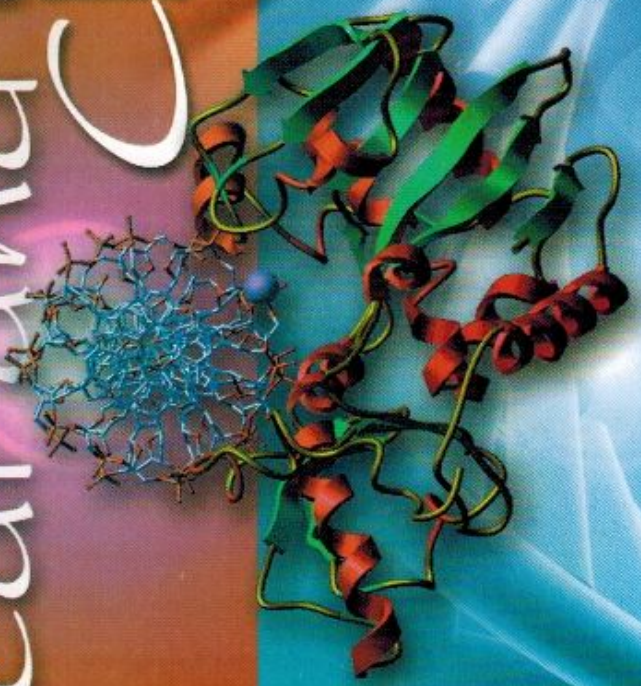

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CORRELATION BETWEEN CYTOPROTECTIVE ACTION OF GERMANIUM COORDINATION COMPOUNDS AND SULFHYDRYL GROUP CONTENT IN INTOXICATION WITH DOXORUBICIN

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An important direction in the development of new promising chemical compounds includes the studies of biochemical mechanisms of their established pharmacological activity.

The purpose of this work was to investigate the correlation between the cytoprotective properties of the coordination compounds of germanium with organic bioligands and the content of sulfhydryl groups in the myocardium and the liver of experimental animals in intoxication with doxorubicin and to compare the results with data on cardioprotective and hepatoprotective effects of these compounds.

Biologically active substances represented by coordination compounds of germanium with nicotinic acid were used in the experiments. The experiments were conducted on rats of both sexes weighing 180–220 g. The cytoprotective effects of the compounds were studied after daily i/p administration for 35 days in chronic intoxication with doxorubicin. The levels of total, protein-bound and non-protein sulfhydryl (SH)-groups were determined in the myocardium and the liver using the Ellman's reagent on the 36th day of the experiment. The study results were statistically processed using generally accepted methods of variation statistics. The probability of the differences between the control and test parameters was estimated using the Student's t-test.

During the study of the sulfhydryl group content in a pathology model, a significant decrease in the total, protein-bound and non-protein sulfhydryl groups was observed (1.54, 1.33 and 1.77 times in the myocardium and 1.28, 1.27 and 1.37 times in the liver, respectively ($P<0.05$)) compared to the control group, which was consistent with the literature data on the key role of doxorubicin in the development of oxidative stress. Administration of biologically active compounds affected the parameters of thiol groups, depending on the target organ and dose, but the corrective effects were observed both in the myocardium and in the liver ($P<0.05$).

The obtained data on the restoration of the content of sulfhydryl groups in the rat myocardium and liver after administration of coordination compounds of germanium in doxorubicin toxic action is consistent with the literature data on the cardioprotective and hepatoprotective activity of the studied compounds established based on their antioxidant activity. The obtained results will be used in the future studies of biochemical mechanisms of the pharmacological activity of a number of coordination combinations of metals with organic bioligands.

SPECTROSCOPY AND THERMODYNAMIC STUDIES OF AN INTERACTION BETWEEN INTERFERON A2B, OLIGORIBONUCLEOTIDES AND RIBONUCLEOTIDES

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Interactions protein-nucleic acids play a decisive role in many biological processes. From previous studies in our laboratory, it is known that acidic forms of oligoribonucleotides (ORNs) have immunomodulatory and anti-inflammatory effects, saline forms only immunomodulatory, and the complex of acidic forms of ORN with mannitol, besides anti-inflammatory and immunomodulatory activity, also has antiviral activity. However, the mechanism of this process remains unclear. We studied the ability of yeast oligoribonucleotides RNA (ORNs), oligoribonucleotides RNANa salt (ORNsNa), oligoribonucleotides-D-mannitol complex (ORNs-D-M) and RNANa salt with mannitol (ORNsNa-D-M) to affect fluorescence quenching, thermodynamic parameters of interaction and conformational changes of Interferon α2b – a key protein of the antiviral cell defence mechanism. We also conducted research with ribonucleotides.

To investigate the interaction and conformational changes of IFN protein, the fluorescence, CD (circular dichroism) spectroscopies and isothermal titration calorimetry (ITC) were used. The analysis of IFN

...EVSKA M.R. 117
...ЕНКО B.I. 279
...ECHNA O.A. 233, 243
...НА V.P. 227
...ЕНКО A.M. 147
...ТРУЄВА I.B. 297, 299
...ЬКА B.B. 35
...TSKA V.V. 37
...ЬКИЙ Б.С. 38, 125, 224
...TSKII B.S. 18, 30
...ETSKY V.S. 140
...I.M. 235
...ДА К. 237
...ENKO O.S. 316
...НА O.B. 89
...АЙЛО Л.Г. 118
...ОРУК B.M. 223
...СОВА B.Ю. 283
...АЙЧУК I.M. 98
...ВА З.М. 226
...ОВСЬКА I.B. 166
...OVSKA I.V. 227
...ЄВ C.B. 276
...А Н.С. 206
...ЕНКО I.B. 119
...ЕНКО Ю.В. 119
...ENKO T.V. 27
...ЄВ P. 288
...EV R.O. 227
...ЄВА O.B. 118
...ЄВА Ю.В. 301
...НА Г.Г. 228, 251, 276
...NA G.G. 219
...Є. 132
...V.P. 47
...ЛЬНА O.B. 38, 224
...LNA O.V. 30
...O.B. 225

...НА H.B. 288
...SKAYA M. 110
...КОВА Л.М. 225
...КОВА T.M. 277, 278
...KOVA T.M. 95
...Š D. 144
...O.V. 266
...ЕНКО B.B. 16
...O.M. 210, 229
...ЕНКО O.Є. 63
...ENKO A.I. 243
...ЕНКО O.B. 174
...ВИЧ O.K. 71, 96
...В.В. 120
...О.А. 120
...П.Г. 256
...О.С. 246
...Д.Д. 310, 316
...ЕНКО Л.І. 58, 59, 101, ...27, 195
...ENKO L. 173
...ENKO L.I. 159, 264
...К A.M. 39
...ЮК P.C. 113

OSTRENYUK R.S. 187, 230
OSTRYNSKA O.V. 234
ОХРІМЕНКО С.М. 121

П

ПАВЛЕНКО Г.Ю. 135
ПАВЛІЧЕНКО О.Д. 312
PAVLOVA O.S. 232
PAVLOVICH O.V. 122
PAVLIUKH K.V. 289
PALAMARCHUK I.V. 187, 230
ПАЛІЄНКО К.О. 40
ПАЛІЙЧУК О.І. 259, 273, 280
PALONKO R.I. 92
ПАНАС І.Д. 279
PANKIVSKYI S.V. 40
ПАНЧЕНКО В.Г. 278
ПАНЧУК Р. 271
ПАНЮТА О.О. 304
ПАПУРІНА Т.Б. 231
PARELE E. 144
PARKHOMENKO YU.M. 35, 232
PASICHNA E.P. 204
PASICHNYK G.V. 133
ПАСТУХОВ А.О. 40
PATALAKH I.I. 122
ПАХОЛКІВ Н.І. 297, 299
ПАХОМОВ О.В. 263
PASHEVIN D.O. 27
PAIUK O. 215
PAIUK O.L. 290
ПЕЛЕШЕНКО Г.Б. 216
ПЕНДРАК О.А. 311
PEREBYINIS V. 83
ПЕТЕРБУРГСЬКИЙ В.Ф. 228
PETERBURGSKY V.F. 219
ПЕТІК А.В. 41
ПЕТРЕНКО Т.М. 177
PETRENKO A.YU. 279
PETRENKO O.M. 241
ПЕТРОВ С.А. 95, 118, 123
ПЕТРУК А.П. 322
ПЕТРУХ І.М. 316
ПЕТРУШАНКО Т. 237
PETRUSHKO M.P. 122
PIERZYNOWSKI S. 248
ПИЛИПЕНКО І.В. 293
ПИЛИПЕНКО Л.М. 293, 317
ПИЛИПЕЦЬ А.З. 171
ПИРОГ Т.П. 259, 269, 273, 280
ПИРОГ Т.Т. 270
ПИРОГОВА Л.В. 42
PYROGOVA L.V. 27
ПИРШЕВ К.О. 279
ПИХОВА О.В. 35
ПІВЕНЬ О.О. 261
PIKUS P. 282
PILETSKA E.V. 294
PILETSKY S.A. 294
PINIAEV V.I. 122
PIROG T.P. 320
ПІСКУН Р.П. 78
ПЛАТОНОВА Т.М. 42, 46
PLATONOVA T.M. 80, 211

ПЛИТУС А.В. 70
POZDNYAKOVA N.G. 182
POZNANSKI D.V. 173
ПОКОТИЛО І.В. 124
POLIKARPOVA H.V. 124
ПОЛІЩУК В.М. 328
ПОЛІЩУК С.А. 328
POLOKHINA K.V. 55
ПОЛЯНСЬКА Д. 62
ПОНОМАРЕНКО Н.В. 328
ПОНОМАРЕНКО О.М. 42
PONOMARENKO N.S. 33
ПОПОВА Н.М. 168
POPOVA L. 233
POPOVA N. 77
PORTNYCHENKO A. 73
ПОРУБЛЬОВА Л.В. 125
ПОСОХОВА К.А. 257
POSPICHALOVÁ R. 153
ПОТЯГАЙЛО А.Л. 34
ПОХОЛЕНКО Я.О. 224
ПРЕВАРСЬКА Н. 14
PRYVROTSKA I.B. 257
ПРИЙМАК Ю.В. 303, 318
ПРИЛУЦЬКА С. 281
ПРИЛУЦЬКА С.В. 266
PRYS-KADENKO V.O. 92
ПРИСТУПА Б.В. 183
ПРІМОВА Л.О. 176
PRIMOVA L.O. 335
PRIHODCHENKO V.O. 319
PRICHODCHENKO V.O. 301
ПРОКОПЮК О.В. 94
PROTOPOPOV M.V. 234
ПУЗАНОВА В.С. 119
ПУШКАРЬОВ В.В. 244
ПУШКАРЬОВ В.М. 244
PIATETSKA D.V. 320

Р

РАБЧЕНЮК О.О. 51, 321
РАДЧЕНКО В.Г. 262
РАЕВСКАЯ І.М. 277
RAYEVSKY A.V. 43
РАЄЦЬКА Я.Б. 127
РАКША Н.Г. 59, 101, 126
РАМАЗАНОВА С.В. 198
RAROK YU.S. 144
РАТИЧ І.Б. 308, 323
РЕБРІЄВ А.В. 31, 40
REBRIEV A.V. 35
REVKA O.V. 122
РЕЗНІЧЕНКО Л.С. 287
РЕМНЬОВА Н.О. 42
РЕПЕЦЬКИЙ С.П. 283
РЕЧИЦЬКИЙ О.Н. 32
РЕШЕТАР Д.В. 108
РИБАК М.Ю. 192
RYBAK M.YU. 43, 167
RYBALKO S.L. 217
РИБАЛЬЧЕНКО В.К. 148, 272, 283
RYMAR S. 282
RYNDITCH A.V. 40

АЛФАВІТНИЙ ПОКАЖЧИК