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#### 48. RESEARCH OF SMALL QUATERNARY AChE INHIBITORS AS PRETREATMENT OF OP POISONING

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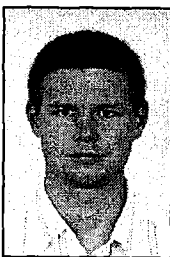
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Small quaternary AChE inhibitors are used (e.g. pyridostigmine) or scoped (e.g. SAD-128) for pretreatment against organophosphate intoxication [1]. The pretreatment is based on competitive inhibition of AChE prior to organophosphate (OP) poisoning. Consequently, the OP can not influence the inhibited AChE and is degraded by other esterases. Although various competitive inhibitors are used globally, pyridostigmine still remains the most broadened. Its side effects including gastrointestinal effects (nausea, intestinal obstruction), increased bronchial secretion, cardiac arrhythmia or cholinergic crisis are well described. Moreover, some bisquaternary competitive inhibitors (e.g. SAD-128) were used to decrease lethal effects of OP poisoning *in vivo*. The further studies dealing with SAD-128 showed its increased ability to interact with brain muscarinic acetylcholine receptors as allosteric inhibitors [2].

The small molecules derived from quaternized pyridine, quinoline and isoquinoline were designed as AChE inhibitors. Their ability to inhibit AChE or BChE was determined *in vitro* using IC<sub>50</sub>. The IC<sub>50</sub> data were compared within each group of compounds with emphasis on selectivity AChE *versus* BChE. The overall study will be presented.

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**Key Words/ Phrases:** OP, AChE, pretreatment, small inhibitor.



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Pharmaceutical Chemistry and Drug Control at the same faculty and he is employed at the Department of Toxicology Faculty of Military Health Sciences (University of Defence, Hradec Kralove). He is currently the head of the Laboratory of Chemistry at the Department of Toxicology. His area of research is medicinal chemistry, biochemistry and toxicology. He is interested in neuroscience, especially the development of novel antidotes for treatment of organophosphorus intoxications, Alzheimer disease and Myasthenia gravis.

#### 49. BEHAVIORAL EFFECTS OF NERVE AGENTS: LABORATORY ANIMAL MODELS

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Diverse and often subtle behavioral consequences have been reported for humans exposed to nerve agents. Laboratory studies of nerve agent exposure offer rigorous control over important variables, but species other than man must be used. Nonhuman primate models offer the best means of identifying the toxic nervous system effects of nerve agent insult and the countermeasures best capable of preventing or attenuating these effects. Comprehensive behavioral models must evaluate preservation and recovery of function as well as new learning ability. The throughput and sensitivity of the tests chosen are important considerations. A few nonhuman primate studies will be discussed to elaborate recent successes, current limitations, and future directions.

**Key Words/ Phrases:** nerve agents, behavior, learning, monkey

#### 50. ANTIMICROBIAL ACTIVITY OF THE ROOT, STEM BARK AND SEED EXTRACTS OF MORINGA OLEIFERA LAM

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Organic extracts (Hexane, dichloromethane, ethyl acetate, methanol) and the aqueous extracts of *Moringa oleifera* Lam or horseradish (root, stem bark and seed) were tested against five bacterial strains using the disc diffusion method and against three fungal strains. The water extracts of the seed were active against a wide range of organisms tested. Hexane and ethyl acetate extracts of the stem bark exhibited moderate activity. Of the fifteen extracts screened, five (33.3%) showed activity against *Staphylococcus aureus* ATCC 25923 and against *Trichophyton mentagrophytes* while two were active against *Microsporum gypseum*. The minimal inhibitory concentration (MIC) values for the water extracts ranged from 6.25 to 50 mg/ml. The good activity observed on the water extract explains the success in

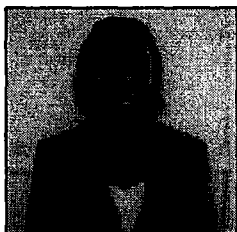


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traditional use of *Moringa oleifera* for the treatment of infectious diseases.



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capable of withstanding any threats, which may arise for population and living organisms. Present-day level of machine-building, electrical engineering, and electronics allows predict creation of industrial plasma installations, adapted to conditions of various terrorist threats, with minimized power consumption and optimized technological parameters. Applied aspect of existing scientific school is at the first stage of evolution yet; however, as it is proved by results of theoretical and experimental investigations, in the nearest future one should expect its new technological outburst in the industry, regarding solution of problems of safety of people's vital activity. Results of investigations given in the report represent only minor part of the wide range of possible practical applications of low-temperature non-equilibrium contact plasma for treatment of water and aqueous media in various fields of engineering and technology.

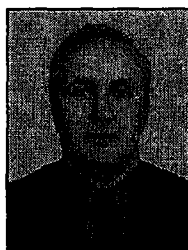
## 51. AQUEOUS MEDIA TREATMENT AND DECONTAMINATION OF HAZARDOUS CHEMICAL AND BIOLOGICAL SUBSTANCES BY CONTACT PLASMA

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Usage of non-equilibrium contact plasma for processes of decontamination and neutralization in conditions of manifestation of chemical, biological and radiation terrorism takes on special significance due to portability of equipment and its mobility in places where toxic liquid media hazardous for people's health are located. Processes of decontamination of aqueous media, seminanted with pathogenic microorganisms and viruses, treatment of water containing toxic heavy metals, cyanides, surface-active substances, and heavy radioactive elements, are investigated. Examples of activation processes in infected water and toxic aqueous solutions present convincing evidence of the way, how new quality technological approach for achievement of high enough degree of the said media treatment is used in each specific case. Among new properties of water activated as a result of action of non-equilibrium contact plasma, it is necessary to mention presence of cluster structure, confirmed by well-known spectral and physical-chemical methods, presence of peroxide compounds, active particles and radicals. Anti-microbial activity which is displayed under action of plasma in aqueous media (chemically pure water, drinking water, aqueous solutions of sodium chloride, potassium iodide, as well as other inorganic compounds) towards wide range of pathogenic and conventionally pathogenic microorganisms allows use them as reliable, accessible and low-cost preparations for increasing the degree of safety of food products. Combination of such processes with known methods of filtration and ultra-filtration gives an efficient and available complex

## 52. PUBLIC AWARENESS – CALENDAR WITH INFORMATION ABOUT EMERGENCY PREPAREDNESS

**Sunčana Podhraški Benković**

Nevenka Novosel

State Office for Nuclear Safety in co-operation with the Ministry of Science, Education and Sport, Nuclear Power Plant Krško (in Slovenia) and Agency for Education during the years 2002 till now realized the project of preparing the calendar for families living in the circle 25 km from the Nuclear Power Plant Krško (Slovenia) and in the circle of 100 km from Nuclear Power Plant Paks (Hungary).

The calendars are containing primary school pupils' paintings about energy, environment, nuclear technology and additional information about preparedness in the Republic of Croatia in the case of nuclear accident and recommendation for acting. Collecting of paintings is carried out each year between pupils from second to eight grades in the schools near Nuclear Power Plant Krško and Nuclear Power Plant Paks. Expert commission chose twelve best paintings for the following year. This kind of project is only one way of public relations and awareness which helps in expanding knowledge