

The brains of those guinea pigs that were successfully protected from OP poisoning by pre-or post-treatment with galantamine were compared to those of control guinea pigs morphometrically using Fluoro Jade B staining. Neuronal viability and structures were very similar in the brains of control and (galantamine+atropine)-treated, OP-challenged animals.

#### Example 2

This example demonstrates the effectiveness of post-treatment with galantamine in a mammal, which has been exposed to an OP.

Soman (42 µg/kg) was administered (subcutaneously) to guinea pigs (young males weighing 300-420 g). After 1 min, atropine (10 mg/kg) was administered (intramuscularly) to the animals. Simultaneously with or subsequently to (e.g., 4 min later) atropine administration, galantamine (8-10 mg/kg) was administered (intramuscularly) to the animals. Administration of 8-10 mg/kg galantamine within 5 min of administration of soman provided 100% protection. In contrast, administration of 6 mg/kg galantamine within 5 min of administration of soman only provided approximately 35% survival. In the first 24 hrs, all guinea pigs showed about a 5% weight loss; however, in the following days, the guinea pigs gained weight at the same rate as control animals that were not challenged with OPs.

All references, including publications, patent applications, and patents, cited herein are hereby incorporated by reference to the same extent as if each reference were individually and specifically indicated to be incorporated by reference and were set forth in its entirety herein.

The use of the terms “a” and “an” and “the” and similar referents in the context of describing the invention (especially in the context of the following claims) are to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., “such as”) provided herein, is intended merely to better illuminate the invention and does not pose a limitation on the scope of the invention unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the invention.

Preferred embodiments of this invention are described herein, including the best mode known to the inventors for

carrying out the invention. It should be understood that the illustrated embodiments are exemplary only, and should not be taken as limiting the scope of the invention.

What is claimed is:

1. A method of treating organophosphorous (OP) poisoning by administering to a mammal at risk for OP poisoning therapeutically effective amounts of galantamine and an antimuscarinic agent according to a treatment regimen selected from the group consisting of:

- 1) administering galantamine prior to OP exposure and an antimuscarinic agent after OP exposure,
- 2) administering galantamine after OP exposure simultaneously with antimuscarinic agent, and
- 3) administering antimuscarinic agent after OP exposure and galantamine after administration of the antimuscarinic agent.

2. The method of claim 1, wherein the galantamine is administered orally or intramuscularly.

3. The method of claim 1, wherein galantamine is administered up to about 1 hour before or up to about 5 minutes after exposure to an OP.

4. The method of claim 1, wherein the antimuscarinic agent is atropine.

5. The method of claim 1, wherein the antimuscarinic agent is atropine sulfate and wherein the galantamine is galantamine hydrobromide.

6. The method of claim 1, wherein the OP exposure is a lethal exposure level of up to about 1.5×LD50 and said galantamine preserves neuronal structures in the brain of the treated mammal.

7. The method of claim 1, wherein the galantamine is administered up to about 1 hour before exposure to OP.

8. The method of claim 1, wherein the galantamine is administered about 30 minutes before exposure to OP.

9. The method of claim 1, wherein regimen 1) further comprises administering galantamine hydrobromide up to about 1 hour before OP exposure and administering atropine sulfate within about 2 minutes after OP exposure,

regimen 2) further comprises administering galantamine hydrobromide after OP exposure simultaneously with atropine sulfate and within about 2 minutes of OP exposure, and

regimen 3) further comprises administering atropine sulfate within about 2 minutes after OP exposure and administering galantamine after administration of the atropine sulfate and within about 5 minutes of OP exposure.

10. The method of claim 9, wherein the galantamine is administered orally or intramuscularly.

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