

## Lipoic Acid Mineral Complex Monograph

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### **Lipoic Acid Mineral Complex (LAMC) Mechanism of Action Information: (1)**

LAMC is a redox molecule that facilitates energy charge transfer at the cellular level with regards to the cellular transport chain, it can therefore protect and provide energy. Mimics the electron transport chain. Differs from free radical scavengers (e.g. alpha-lipoic acid) since there is no free lipoic acid or palladium. They are irreversibly bound together resulting in a molecule that is both fat and water soluble. LAMC (brand name in North America: Poly-MVA, also referred to as Pd-LA) is a polymer (liquid crystal) rather than a single molecule. Therefore, the polymer provides a unified redox reaction. In summary it is an extremely effective energy transferring molecule. LAMC has been shown to be neuroprotective and helpful in supporting the mitochondrial complex. (2,3,4,5)

### **Published research addressing the potential use of LAMC in various degenerative and oncologic settings:**

Myocardial Damage: “The level of GSH was also significantly improved and the level of lipid peroxidation was decreased significantly ( $p < 0.05$ ) by POLY-MVA. The results indicate that POLY-MVA is effective to protect the age-linked decline of myocardial mitochondrial antioxidant status. The findings suggest the use of this formulation against myocardial aging.” (6)

Cardio and Neurodegenerative disease: “The unique electronic and redox properties of palladium alpha-lipoic acid complex appear to be a key to this physiological effectiveness. The results strongly suggest that this formulation might be effective to protect the aging associated risk of cardiovascular and neurodegenerative diseases.” (7)

Neurodegeneration and Acetylcholine Function: “The results of the current study demonstrate that Pd-LA improves mitochondrial energy status in the brains of aged rats. The effects can be attributed to the enhancing effect on the Krebs cycle dehydrogenase and the activities of complexes I, III, and IV. The results further support the possible use of Pd-LA as an adjuvant treatment, together with the standard cholinesterase inhibitors, in individuals with mild or moderate dementia caused by Alzheimer's disease (AD).” (8)

Diabetes: “Results of the study conclude that the Pd-LA complex is effective in lowering the blood glucose level and enhancing the declined antioxidant status in diabetic animals. Significant finding(s) of

the study include: (i) Pd-LA significantly increased the tolerance of glucose and was also effective in ameliorating hyperglycemia induced by alloxan; (ii) Pd-LA significantly enhanced the activities of blood superoxide dismutase, catalase, glutathione peroxidase and level of glutathione in diabetic animals; and (iii) Pd-LA showed significant in vitro antioxidant activity. This study adds: The therapeutic efficiency of Pd-LA is demonstrated against declined antioxidant status as well as hyperglycemia associated with diabetes.” (9)

Mitochondrial and Oxidative Protection: “While numerous routes offer varying degrees of CA1 neuronal survival after transient global ischemia, only the LAPd complex, which quenches radicals and provides energy to stabilize the mitochondria, offers such significant protection. Thus, the administration of Poly MVA may be a potent neuroprotective agent for victims of transient ischemic attack (TIA), cardiac arrest, anesthetic accidents, or drowning.” (10)

Radioprotection: “The administration of POLY-MVA significantly reduced the gamma-radiation-induced mortality and also aided recovery from the radiation-induced loss of body weight in mice surviving after 8 Gy gamma-radiation exposure. These results suggest the potential use of POLY-MVA as a radioprotector in cases of planned radiation exposures.” (11, 14-25)

#### **Clinical and Research Experience (12):**

We have used oral and IV LAMC (PolyMVA) in the setting of mitochondrial damage and dysfunction, as adjunctive therapy for quality of life in oncology patients and as a co-therapeutic agent with Dichloroacetate in advanced cancers. We are currently running two human trials (active comparator) looking at the effect of LAMC on signs and symptoms of Multiple Sclerosis as well as post infectious fatigue. [Ongoing trials run at the AMSA clinics with support from Stonybrook University.]

#### **Safety and the “palladium” content:**

1. It, due to use in human scientific trials, has FDA approval based on animal and human trials for safety and dosing / pharmacology profiles, something almost no supplement has.
2. The palladium (Pd) is NOT in a free form. The Pd is used to bind the residues of the two original ALA molecules and forms a non-reducing bond. It is ‘stuck’ in the molecule the same way iron is stuck in hemoglobin (and so never becomes free unless a person has pathologic hemolysis). So the pd is used as a molecular anchor and does not react with cells in the way free Pd would (again exactly like iron in hemoglobin).

3. I have personally (12) used it in thousands of administrations, and worked with neurologists, oncologists and other providers on its use in University based human and animal trials. We have seen no toxicity and see the benefits as much higher than potential risks. Additionally in some cases (MS, mitochondrial injury, some cancers and other cases) it adds synergy I have not seen from any other supplement.

### **Dosing:**

Doses in the Autoimmune, Fatigue, Mitochondrial injured and Neurodegenerative population need to be lower and ramped up more slowly than in the oncology patient in our experience.

- Oral doses can be 5 to 15 mL BID in non-oncology cases and 10-20 mL BID-TID in oncology cases.
- IV doses are given in 100 to 250 mL D5W or NS
  - 5 - 10 mL test dose on the first administration
  - Ramp up to 20-25 mL in non-oncology cases
  - Ramp up to 40 mL in oncology cases
- Give in series (as a separate IV bag) with other nutrients or medications if desired. Compatible with most IV therapies (See next section). [13]

### **Pediatric Dosing:**

Clark's Rule is a medical term referring to a procedure used to calculate the amount of medicine to give to a child aged 2-17. The procedure is to take the child's weight in pounds, divide by 150lbs, and multiply the fractional result by the adult dose to find the equivalent child dosage.

$$\text{Pediatric dose} = [\text{child's weight (lb)} / 150 \text{ (lb)}] \times \text{Adult dose}$$

For example: If an adult dose of medication calls for 30mg and the child weighs 30lbs. Divide the weight by 150 (30/150) to get 1/5. Multiply 1/5 times 30mg to get 6mg. (Or convert the fraction to a decimal and multiply – 0.20 in this case).

### **Common IV example:**

Adult goal dose is 40 mL Poly-MVA - Child weighs 25 pounds =  $[25 \text{ lb} / 150 \text{ lb}] \times 40 \text{ mL} = 1/6 \times 40 \text{ mL}$   
[convert to a decimal] =

DOSE:  $0.167 \times 40 \text{ mL} = 6.7 (7) \text{ mL}$  dose (\*I have used LAMC in children as young as four years of age).

### **Compatibility with other IV protocols (12,13):**

Poly-MVA (LAMC) is an incredible synergist in many IV therapy sequences. Below are recommendations for infusion in proximity or separately from particular therapies based on cellular actions of LAMC as well as the other therapies mentioned. The purpose of these recommendations is to make maximal use of the potential for therapeutic synergy.

#### **Infuse separately:**

Separate LAMC from these therapies by 4-6 hours (ideally LAMC infusion first then these IV's later in the day or any time on the following day.):

- Artesunate with High Dose IV Ascorbate
- High Dose IV Ascorbate
- Ozone
- Hydrogen Peroxide
- Mistletoe (IV) products [SQ Mistletoe does not apply]

***The therapeutic goal is to have the LAMC in the cells and working before these other therapies are circulating in the blood.***

#### **Infuse in proximity:**

Infuse LAMC in sequence / at the same IV sitting with:

- Curcumin (low or high dose, give LAMC first)
- Artesunate with low dose IVC (give LAMC first) Example – ART-LDIVC as used in autoimmunity.
- Water soluble vitamin – mineral and / or amino acid formulas \*\*
- Glutathione \*\*
- Phosphatidylcholine \*\*

\*\* LAMC may be given before or after any of these IV therapies.

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