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Midazolam Lysine Prodrug Rapid Delivery System (20150121, Dr. Ronald Siegel)

IP Status: Issued US Patent; **Application #:** 15/559,408

Nasal Drug Delivery System for Midazolam

A drug delivery system has been created for the rapid absorption of midazolam lysine prodrug (MDZ-pro) across the nasal mucosal membrane to treat seizures or other neurological emergencies.

Midazolam (MDZ) is currently used to treat seizures, but the delivery methods are inconvenient and have poor patient compliance. At-home treatments consist of rectal administration and hospital treatments consist of IV administration. These methods are poorly tolerated by patients and are not suitable for emergency treatments.

The MDZ-pro system allows for intranasal delivery, which is a convenient method for both at-home treatments and for hospital use. Additionally, most existing MDZ-intranasal delivery systems use organic excipients, which are irritating to the mucosal membranes, while the new MDZ-pro system does not.

Prodrug Form of MDZ

The system uses a prodrug form of MDZ, which allows for nasal administration of the drug and is more convenient than existing methods and is better tolerated by patients. MDZ-pro, when co-administered with a converting enzyme, renders MDZ in a supersaturated aqueous solution that is rapidly absorbed across mucosal membranes.

The ability for intranasal delivery, combined with the rapid absorption of MDZ across the mucosal membranes, makes this drug delivery system ideal for emergency response to seizures.

BENEFITS AND FEATURES OF MDZ-PRO:

- Allows for intranasal drug delivery
- Convenient for both at-home and hospital settings
- Better tolerated by patients than existing methods
- Not irritating to mucosal membranes
- Co-administered converting enzyme rapidly converts MDZ-pro to MDZ

Phase of Development - In vitro assessment

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