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Phosphate Ester Derivatives of Glucagon

A phosphate ester prodrug approach improves the solubility and stability of glucagon in aqueous form, enabling its use in advanced medical devices such as pens, pumps, and artificial pancreas systems.

Glucagon is a 29 amino acid peptide hormone used to treat severe hypoglycemia, typically in diabetic patients. Glucagon is typically marketed in lyophilized, or freeze-dried form, as it is unstable in acidic or basic aqueous solutions, which inhibits its use in medical devices such as pens or pumps. As a result, the delivery process is complicated, particularly in emergencies.

To address these concerns, researchers at Purdue University have developed a method of stabilizing glucagon and improving its solubility in aqueous form. As a result, glucagon can be used in numerous applications such as pen devices and pumps, and even as an artificial pancreas. Because the technology uses a phosphate ester prodrug approach, it expected to have no biological activity in the derivative form, and will only be active when the native drug is regenerated. This technology is superior to alternative approaches in that the native, active sequence of glucagon is regenerated once administrated.

Advantages:

-Improves solubility and stability of glucagon in aqueous form

-Increases number of treatment options for hypoglycemic patients

Potential Applications:

-Medical/Health

-Medical device industry

-Pharmaceutical industry

-Hypoglycemia treatment

-New applications for glucagon

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Authors
Shenbaga Moorthy Balakrishnan
Markus Lill
Hamed Tabatabaei Ghomi
Elizabeth Topp

Further information
Joe Kasper
JRKasper@prf.org

Nathan Smith
nesmith@prf.org

View online

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