Case # 335

Modulation of GSK3ß Activity May Offer Disease Treatments

Competitive Advantages

- ☑ Offers new approach to increasing or decreasing GSK3ß activity.
- ☑ Potential applications in a wide variety of clinical disorders.
- ☑ Based on well established relationship between abnormal GSK3ß levels and specific diseases.

A newly discovered approach to the mediation of a process that regulates cell function may lead to effective treatments for a variety of diseases.

GSK3ß, one of two genes known to encode a type of enzyme called Glycogen Synthase Kinase-3, regulates diverse cell functions such as signaling, gene expression, and metabolism through phosphorylation of cellular substrates.

GSK3ß and Disease

Abnormally high and low levels of GSK3ß activity have been associated with a wide variety of disorders, including neurological diseases, diabetes, and cancer.

Future treatments for these disorders may be based on the newly discovered ability of p38 mitogen-activated protein kinase (MAPK) to phosphorylate GSK3ß activity.

Modulating GSK3ß

In conditions associated with reduced GSK3ß activity, such as cancer and diabetes, treatments would be intended to reduce cell survival by inhibiting the phosphorylation of GSK3ß.

In conditions associated with elevated GSK3ß activity, particularly neurological conditions such as stroke, head trauma, and Alzheimer's disease, treatments would be intended to increase cell survival by increasing the level of GSK3ß phosphorylation.

In potential disease therapies, a synthetic peptide of GSK3ß (or similar small molecule) could be used as a specific GSK3ß blocker. Also, antibodies that recognize the peptide may prove useful in diagnosing reduced or elevated GSK3ß activity levels.

Next Steps

Further research will be conducted on the modulation of GSK3ß activity. Commercial laboratories may conduct additional studies to investigate potential clinical applications.

Patent / Licensing Status

Patent pending. Exclusive rights available.

Learn More

Phosphorylation by p38 MAPK abstract
www.sciencemag.org/cgi/content/abstract/320/5876/667

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