

A Zebrafish Inducible Model Of Chronic Hyperglycemia

Tech ID: 34266 / UC Case 2025-798-0

BRIEF DESCRIPTION

A transgenic zebrafish model enabling controlled pancreatic β -cell ablation to simulate chronic hyperglycemia and study diabetes-related pathology.

FULL DESCRIPTION

This technology utilizes a highly active bacterial nitroreductase enzyme (NTR2.0) expressed specifically in zebrafish insulin-producing β -cells via a transgene, allowing selective ablation of these cells upon treatment with low doses of the antibiotic metronidazole (MTZ). This targeted β -cell destruction halts insulin production, inducing sustained elevated blood glucose levels that mimic human diabetic conditions. The model avoids toxic side effects typical of previous methods by requiring significantly lower MTZ doses, enabling chronic hyperglycemia studies and screening for treatments of diabetes-associated tissue damage.

SUGGESTED USES

- » Preclinical research for diabetes pathophysiology and complications.
- » Drug discovery and screening for anti-diabetic and tissue-protective compounds.
- » Regenerative medicine studies focusing on β -cell regeneration.
- » Academic and pharmaceutical research on metabolic diseases.

ADVANTAGES

- » Highly specific β -cell ablation with minimal off-target toxicity.
- » Requires low doses of MTZ, reducing harmful side effects.
- » Enables sustained chronic hyperglycemia in both larval and adult zebrafish.
- » Facilitates modeling of diabetes and its pathological effects in vivo.
- » Supports drug screening for diabetes-related tissue damage.

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OTHER INFORMATION

CATEGORIZED AS

- » **Agriculture & Animal Science**
 - » Animal Science
 - » Transgenics
- » **Medical**
 - » Disease: Metabolic/Endocrinology
 - » Research Tools
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 - » Animal Models
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