

Resource Summary Report

Generated by [RRID](#) on Aug 19, 2026

[Laconic/pcDNA3.1\(-\)](#)

RRID:Addgene_44238

Type: Plasmid

Proper Citation

RRID:Addgene_44238

Plasmid Information

URL: <http://www.addgene.org/44238>

Proper Citation: RRID:Addgene_44238

Insert Name: Laconic (LACtate Optical Nano Indicator from CECs)

Organism: Synthetic

Bacterial Resistance: Ampicillin

Defining Citation: [PMID:23469056](#)

Vector Backbone Description: Backbone Marker:Invitrogen; Backbone Size:5418; Vector Backbone:pcDNA3.1(-); Vector Types:Mammalian Expression, lactate biosensor; Bacterial Resistance:Ampicillin

Comments: Laconic is a genetically-encoded biosensor that detects lactate in the physiological range. The sensor was based on LldR, a bacterial transcription regulator that consists of a lactate-binding/regulatory domain and a DNA-binding domain. Laconic consists of a N-terminal mTFP, followed by the LldR flanked by linkers, and finally a C-terminal Venus. See Addgene plasmid# 46307: NLS-Laconic/pCMV-myc-nuc for a nuclear-targeted version of Laconic: <http://www.addgene.org/46307/> .

Plasmid Name: Laconic/pcDNA3.1(-)

Record Creation Time: 20220422T222229+0000

Record Last Update: 20260815T081514+0000

Ratings and Alerts

No rating or validation information has been found for Laconic/pcDNA3.1(-).

No alerts have been found for Laconic/pcDNA3.1(-).

Data and Source Information

Source: [Addgene](#)

Usage and Citation Metrics

We found 40 mentions in open access literature.

Listed below are recent publications. The full list is available at [RRID](#) .

Liu R, et al. (2025) Harmine promotes axon regeneration through enhancing glucose metabolism. *The Journal of biological chemistry*, 301(3), 108254.

Nguyen NTB, et al. (2025) Lactate controls cancer stemness and plasticity through epigenetic regulation. *Cell metabolism*, 37(4), 903.

Wolff C, et al. (2025) Insulin and leptin acutely modulate the energy metabolism of primary hypothalamic and cortical astrocytes. *Journal of neurochemistry*, 169(1), e16211.

Horikoshi M, et al. (2024) Distinct lactate metabolism between hepatocytes and myotubes revealed by live cell imaging with genetically encoded indicators. *Biochemical and biophysical research communications*, 694, 149416.

Bischof H, et al. (2024) mitoBKCa is functionally expressed in murine and human breast cancer cells and potentially contributes to metabolic reprogramming. *eLife*, 12.

Shi C, et al. (2024) MCT1-mediated endothelial cell lactate shuttle as a target for promoting axon regeneration after spinal cord injury. *Theranostics*, 14(14), 5662.

Calbiague-Garcia V, et al. (2024) Extracellular lactate as an alternative energy source for retinal bipolar cells. *The Journal of biological chemistry*, 300(4), 106794.

John S, et al. (2024) Real-time resolution studies of the regulation of lactate production by hexokinases binding to mitochondria in single cells. *PloS one*, 19(3), e0300150.

Hario S, et al. (2024) High-Performance Genetically Encoded Green Fluorescent Biosensors for Intracellular L-Lactate. *ACS central science*, 10(2), 402.

Todorova V, et al. (2023) Deficits in mitochondrial TCA cycle and OXPHOS precede rod photoreceptor degeneration during chronic HIF activation. *Molecular neurodegeneration*, 18(1), 15.

Natsubori A, et al. (2023) Serotonergic neurons control cortical neuronal intracellular energy dynamics by modulating astrocyte-neuron lactate shuttle. *iScience*, 26(1), 105830.

John S, et al. (2023) Real-time resolution studies of the regulation of pyruvate-dependent lactate metabolism by hexokinases in single cells. *PloS one*, 18(11), e0286660.

Nasu Y, et al. (2023) Lactate biosensors for spectrally and spatially multiplexed fluorescence imaging. *Nature communications*, 14(1), 6598.

Calbiague García V, et al. (2023) Evaluation of Photobiomodulation and Boldine as Alternative Treatment Options in Two Diabetic Retinopathy Models. *International journal of molecular sciences*, 24(9).

Lee H, et al. (2023) ApoE4-dependent lysosomal cholesterol accumulation impairs mitochondrial homeostasis and oxidative phosphorylation in human astrocytes. *Cell reports*, 42(10), 113183.

Calbiague García V, et al. (2023) Imaging of lactate metabolism in retinal Müller cells with a FRET nanosensor. *Experimental eye research*, 226, 109352.

Lee HW, et al. (2022) Endothelium-derived lactate is required for pericyte function and blood-brain barrier maintenance. *The EMBO journal*, 41(9), e109890.

Gross D, et al. (2022) IKCa channels control breast cancer metabolism including AMPK-driven autophagy. *Cell death & disease*, 13(10), 902.

Deck M, et al. (2022) Physiology of PNS axons relies on glycolytic metabolism in myelinating Schwann cells. *PloS one*, 17(10), e0272097.

Koveal D, et al. (2022) A high-throughput multiparameter screen for accelerated development and optimization of soluble genetically encoded fluorescent biosensors. *Nature communications*, 13(1), 2919.