

A Fast High-Affinity Fluorescent Serotonin Biosensor Engineered from a Tick Lipocalin

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The authors have withdrawn their manuscript whilst they perform additional experiments to test some of their conclusions. Therefore, the authors do not wish this work to be cited as reference for the project. If you have any questions, please contact the corresponding author.

Details

Regrettably, we, and several other researchers in the corresponding author's lab and not involved in the original study, have been unable to reproduce some of the reported key results under conditions originally described.

We recently used the pDisplay-G-GESS-M plasmid to transfect HEK 293T cells and observed that the membrane localization of the biosensor was sensitive to FBS batches. By using an FBS batch from Gibco (Cat# 16000-044 and Lot #2103017RP), we were able to replicate the membrane localization similar to what was reported in Fig. 1e. However, the cells required the addition of several hundred micromolar of serotonin for robust fluorescence increase. These new results suggest that the affinity of G-GESS to serotonin is worse than that claimed in the initial article.

We further used liquid chromatography–mass spectrometry (LC–MS) to analyze the serotonin stock solutions identified in our -80°C lab freezer and observed MS peaks suggesting a glutamate contamination in some of the analyzed samples. In addition, we used polymerase chain reaction (PCR) or reverse transcription–PCR (RT–PCR) to amplify gene fragments from our viral stocks and the sequencing results indicate that the viral stocks were contaminated with a glutamate biosensor.

While we are still performing further investigation, in light of the existing findings, all authors agree to retract this paper.

In the initial article, the sensor was tested in several cell culture systems, brain slices and behaving mice. We are presently unable to fully explain the observed sensor responses described in the initial article, but it is highly possible that these responses could be caused by the contaminated chemical or viral stocks.

We deeply apologize to the scientific community for not detecting these problems sooner.