Docket #: S22-192

Kinase-modulated bioluminescent indicators for reporting drug activity in vivo

Stanford researchers in the Lin Lab have identified kinase-modulated bioluminescent indicators (KiMBIs) which can assess real time kinase inhibition in target tissues *in vivo*.

Kinase inhibitors are a highly researched area as therapies for cancer and Parkinson's Disease, as well as other neurological diseases. Existing methods for measurements of kinase activity involve tissue retrieval and biochemical analysis, which require the use of numerous animals and manual dissection, causing this method to be expensive and time-intensive. KiMBIs report kinase inhibition via light production from the luciferase substrate injection, enabling a noninvasive, inexpensive, and real-time assessment of kinase inhibition.

Stanford Medicine 4/11/23 - Bioluminescence helps researchers develop cancer drugs for brain

Stage of Development

- Prototype

Figure:

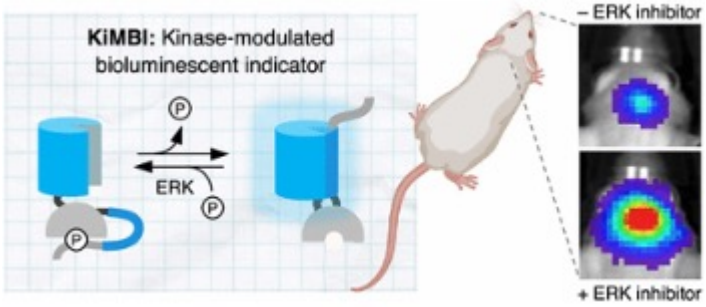


Figure description: Graphical Abstract

Image credit:https://pubs.acs.org/doi/10.1021/acscentsci.3c00074

Applications

- **Drug development:** Testing which kinase inhibitors can cross the blood brain barrier
- **In vivo analysis:** provides proof of kinase inhibition and can correlate kinase inhibition with other desirable outcomes (i.e. tumor shrinkage or neurological performance) in advance of Investigative New Drug (IND) filing

Advantages

- **More accessible for drug development:**
  - **Noninvasive and cost effective -** does not require expensive imaging equipment
- **Real time assessment** of kinase inhibition in target tissues in vivo
- **Nonterminal experiment -** Allow multiple data points from each mouse

Publications

- Wu, Y., Walker, J.R., Westberg, M., Ning, L., Monje, M., Kirkland, T.A., Lin, M.Z. and Su, Y., 2023. Kinase-modulated bioluminescent indicators enable noninvasive imaging of drug activity in the brain. *ACS Central Science, 9*(4), pp.719-732.

Patents

- Published Application: WO2024059832
- Published Application: 20260077065

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