Detection of Human GPCR Activity in Drosophila S2 Cells Using the Tango System

By Salim, E (Salim, Emil) [1] , [2] ; Hori, A (Hori, Aki) [1] ; Matsubara, K (Matsubara, Kohei) [3] ; Takano-Shimizu, T (Takano-Shimizu, Toshiyuki) [3] ; Pratomo, AR (Pratomo, Andre Rizky) [1] ; Marianne, M (Marianne, Marianne) [2] ; Syahputra, A (Syahputra, Armia) [4] ; Husori, DI (Husori, Dadang Irfan) [2] ; Inoue, A (Inoue, Asuka) [5] , [6] ; Abdullah, MA (Abdullah, Maryam Aisyah) [7] ; ...More

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Abstract G protein-coupled receptors (GPCRs) are essential cell surface proteins involved in transducing extracellular signals into intracellular responses, regulating various physiological processes. This study validated the use of the Tango assay, a sensitive method for detecting GPCR activation, in Drosophila Schneider 2 (S2) cells, focusing on the human Dopamine Receptor D4 (DRD4). Plasmids encoding the LexA-tagged human DRD4 receptor and a luciferase reporter were co-transfected into Drosophila S2 cells and stimulated with dopamine. Receptor activation was measured by quantifying the luciferase activity. The system showed high specificity for dopamine, with no activation in response to octopamine, a non-ligand for DRD4. Furthermore, the system effectively detects activation by a novel compound. These results demonstrate that Drosophila S2 cells, coupled with the Tango assay, provide a viable model for studying human GPCR function and ligand specificity. This system enables the rapid screening of potential GPCR ligands in a cost-effective cellular model.

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Author Information Corresponding Address: Salim, Emil; Kuraishi, Takayuki (corresponding author)

Kanazawa Univ, Inst Med Pharmaceut & Hlth Sci, Fac Pharm, Osaka 9201192, Japan

Corresponding Address: Salim, Emil (corresponding author)

Univ Sumatera Utara, Fac Pharm, Dept Pharmacol & Clin Community Pharm, Medan 20155, Indonesia
Affiliation
University of North Sumatra
ROR ID: https://ror.org/01kknrc90
E-mail Addresses :
emilsalim@usu.ac.id; tkuraishi@staff.kanazawa-u.ac.jp
Addresses :
1 Kanazawa Univ, Inst Med Pharmaceut & Hlth Sci, Fac Pharm, Osaka 9201192, Japan
2 Univ Sumatera Utara, Fac Pharm, Dept Pharmacol & Clin Community Pharm, Medan 20155, Indonesia
Affiliation
University of North Sumatra
ROR ID: https://ror.org/01kknrc90
3 Kyoto Inst Technol, KYOTO Drosophila Stock Ctr, Saga Ippongi Cho 1,Ukyo Ku, Kyoto 6168354, Japan
Affiliation
Kyoto Institute of Technology
ROR ID: https://ror.org/00965ax52
4 Univ Sumatera Utara, Fac Dent, Dept Periodontol, Medan 20155, Indonesia
Affiliation
University of North Sumatra
ROR ID: https://ror.org/01kknrc90

Tohoku University Graduate School of Pharmaceutical Sciences Faculty of Pharmaceutical Sciences
6 Kyoto Univ, Grad Sch Pharmaceut Sci, 46-29 Yoshida Shimo Adachi Cho,Sakyo Ku, Kyoto 6068501, Japan
Affiliation
Kyoto University
ROR ID: https://ror.org/02kpeqv85
Kyoto University Graduate School of Pharmaceutical Sciences Faculty of Pharmaceutical Sciences
7 Int Islamic Univ Malaysia, Dept Pharmaceut Chem, Kulliyyah Pharm, Kuantan 25200, Pahang, Malaysia
...fewer addresses
E-mail Addresses :
emilsalim@usu.ac.id; horiaki1102@staff.kanazawa-u.ac.jp; dgrc-tec@kit.ac.jp; fruitfly@kit.ac.jp; andrer.pratomo@gmail.com; marianne80@usu.ac.id; armia.syahputra@usu.ac.id; dadang@usu.ac.id; iaska@tohoku.ac.jp; maryamaisyah9221@gmail.com; farisya@iium.edu.my; kamalrullah@iium.edu.my; tkuraishi@staff.kanazawa-u.ac.jp

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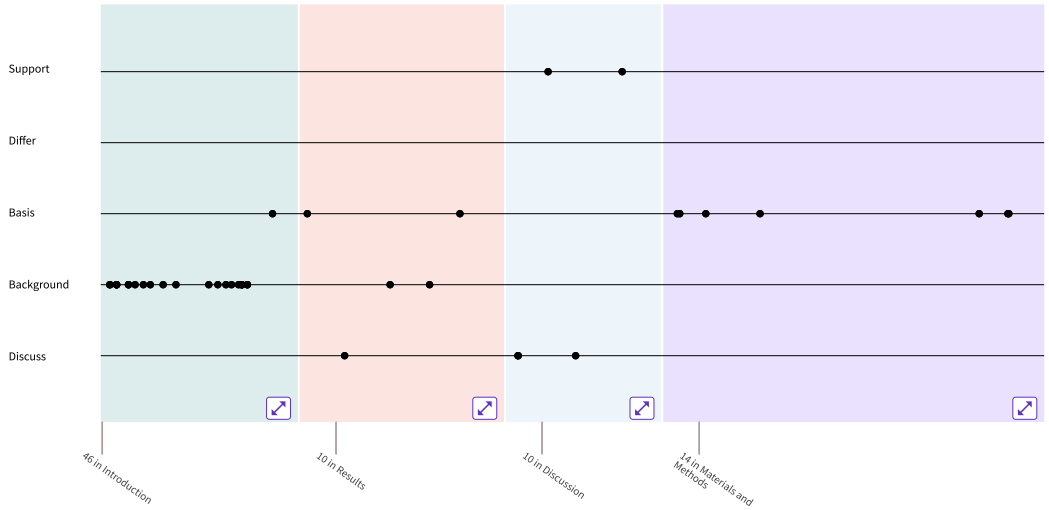

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