Title: Indole Based Fluorescent Bio-probe For The Super-resolution Wash-free Live Cell Imaging of Endoplasmic Reticulum

Technology USP

❑Novel Indole based probe SAG-536 developed for the rapid and selective detection of intracellular lipophilic Endoplasmic Reticulum (ER) membrane with high contrast imaging in live cells as well as the first successful example of selective light-up probe for distinct ER imaging in live cells.

❑Optimal for imaging Live ER Membrane in wash-free conditions in vitro.

❑The developed probe is easy to synthesize, which lowers the cost of available dyes in the market to stain the ER.

Background

The existing fluorescence probes for staining intracellular ER suffers with fluorescence crosstalk, high cost, background noise and unable to measure the specific ER membrane in high resolution to understand the ER stress in diseased condition.

Scientific merit

Indole based fluorescence probe enables the following features of ER specific probe in live cell:

- ❑ High Selectivity
- ❑ Cell membrane permeability in Live and fixed condition
- ❑ Low Florescence cross talk
- ❑ Highly photostable for high contrast image and 3D imaging of ER membrane.
- ❑ Viscous environment sensitive

Societal Relevance

In order to monitor the Endoplasmic Reticulum in Live/ Fixed cells in various cancer/non-cancer cells, and deep tissues via confocal imaging the SAG-536 can be widely used. ER stress monitoring can be done with high resolution imaging in live cells.

Market size/Commercial Potential

Hospital, laboratories, the pharmaceutical industry and medical research, vaccine and drug development and disease diagnosis at initial stages, flow cytometry uses dyes to detect or measure the characteristics of cells or tissues.

TRL

Current Technology Readiness Level (TRL): 5

USP of technology

The commercialized BODIPY TR Glebenclamide (ER tracker Red) and BODIPY FL Glibenclamide (ER Tracker Green) reported to be larger rigid structure and small stokes shift are main disadvantages. Even more, they are not able to image the 3D structure of ER selectively.

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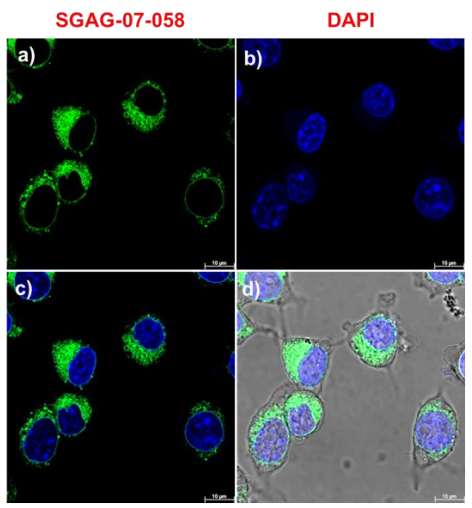
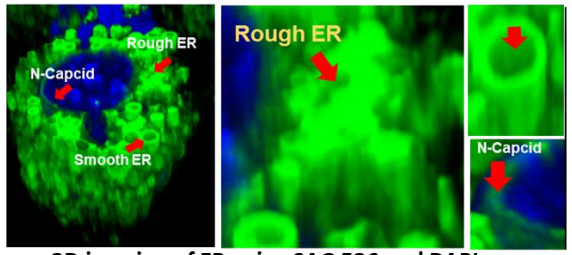
Overseas market penetration

Fluorescent dyes are in growing demand in academics Biopharmaceutical, Hospital and Commercial Laboratories, etc and the market is expected to grow (CAGR 2023-2030). The global Fluorescent Dye market was valued at US$ 909.8 million in 2023 and is anticipated to reach US$ 1231.1 million by 2030, Asia Pacific is Expected to Grow the fastest during the forecast period.

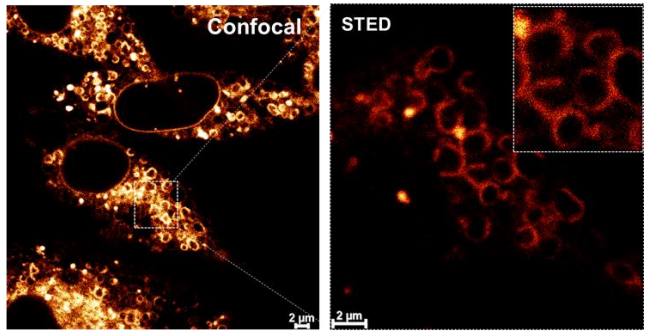
High Resolution image of the technology prototype



Wash free Live cell imaging probe SAG 536 selective for ER membrane



3D imaging of ER using SAG 536 and DAPI



SH-SY5Y + SGAG-07-058 Confocal image

SH-SY5Y + SGAG-07-058 High resolution (STED) image

CSLM and Super resolution STED image of ER membrane

Number of samples tested/validated

Intracellular imaging of Endoplasmic Reticulum in live Cancer cells (neuroblastoma cell lines).

Cost of Sampling

INR approx. 16,000/- per 100gm of SAG-536

Studies conducted for getting regulatory approval

NIL

Any other information relevant for evaluating the technology

NIL

Patent Details

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Details of PIs, funding agency and third party, if involved in development

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