



Organelle-Targeted Genetically-Encoded Voltage Indicators And Methods Of Use Thereof

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The Invention

UW researchers have developed modified genetically encoded plasma membrane voltage probes for monitoring mitochondrial and ER membrane voltage gradients. A fluorescence protein tag was coupled with a membrane targeting protein that specifically targets the mitochondria or ER. The probe fluoresces when a non-fluorescent anionic membrane dye moves through the membrane due to the current. This dye provides an excitation energy to the fluorescent protein tag which leads to the tag fluorescing. The inventors adapted hybrid voltage sensors previously developed on campus for measuring voltage across the cell membrane. Unlike other membrane anchored voltage sensors, these probes use a single membrane spanning protein fused to cerulean fluorescent protein. The previous work found that this fluorescent protein proved to be the best fluorescent resonance energy partner with the membrane dye, dipicrylamine. The inventors tried a number of proteins that specifically bind to the mitochondrial or ER membranes before they found the optimal membrane proteins for targeting these organelles. The mito-GEVI probe has the following sequence: GSKRGVPVAVLLPVFALTLVAVWAFVRYRKQL – CeFP The ER-GEVI probe has the following sequence: MDPVVVLGLCLSLLLSLWKQSYGGG - CeFP

Tech Fields

- [Drug Discovery & Development : Preclinical testing](#)
- [Research Tools : Detection](#)

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