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Probe development for neuroglial cell live imaging

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The nervous system controls our body, processes sensory information, and generates a memory through the orchestration of multiple cell types, including glia as well as neurons. However, visualizing a type of live cells in nervous tissues often require transgenic animals or virus infection to label the target cells with fluorescence proteins, causing common challenges to apply due to the complexity of techniques and the limitation to apply different species like human. Herein, I will present the development of a simple method to label live microglia a type of glial cells specialized for maintaining the nervous tissue environment, using a small chemical fluorescent molecule. Adding the developed probe, named CDr20, before observation to the medium enables the visualizing and tracking of microglia at tissue levels. The probe detects microglia *in vivo* through intravenous injection if BBB has slightly altered. The mechanism study revealed that CDr20 label microglia through the Ugt1a7c-mediated fluorescence turn-on process of the chemical. Because of its simplicity and specificity, developing novel fluorescent chemical probes for targeting other types of cells by the described platform will be very useful in basic neuroscience and further in biomedical applications.

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