S36-5 **Imaging molecular processes in living cells**

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Optical imaging could be the most powerful technique available for observing spatial and temporal dynamics of molecular processes in living cells, if optical indicators for the relevant molecular processes become available. We have been developing fluorescent or bioluminescent indicators for cellular signaling processes, such as protein phosphorylation reactions and second messengers. Using the indicators, we have visualized spatial and temporal dynamics of these molecular processes in living cells. The optical indicators are becoming an indispensable tool for understanding the complex mechanism of the signal transduction in living cells and for screening pharmaceuticals that inhibit or promote molecular processes in the cell.