Editor's LETTER

ACS chemical biology

Investigative Reporters

Journals and their readers depend on exploratory reporters to receive accurate information from inaccessible places. In general, the more inaccessible the place is, the higher the perceived value of the report. Similarly, life sciences depend increasingly on molecular reporters that provide us with information on biochemical activities at specific locations in cells or organisms. These reporters often reveal unexpected insights that will become fundamental for our understanding of biology. However, the majority of biochemical activities in living cells still cannot be visualized, and scientists have an insatiable hunger for reliable reporters of such activities. An additional degree of difficulty is that the faithfulness and accuracy of existing and future reporters, as with their human counterparts, must be critically monitored, and their results, if possible, independently confirmed. Chemical biologists have taken up this challenge and have provided the scientific community with reporters for various biochemical activities. Since its introduction, *ACS Chemical Biology* has become a platform for publishing innovative work in this field, and it should therefore not come as a surprise that all five original research articles in this issue report on the development of tools for the visualization of different biochemical activities. In independent articles by Yano *et al.* (*1*) and Los *et al.* (*2*), two new systems are described for the labeling of fusion proteins with synthetic probes in living cells. Although various approaches for such a protein labeling already exist, both methods present unique features that will permit them to become useful tools for functional proteomics. The manuscript by Nakajima *et al.* (*3*) introduces a highly sensitive fluorescence-based reporter to visualize brain-derived neurotrophic factor as it is secreted from hippocampal neurons. And finally, two independent papers published by Fan *et al.* (*4*) and Kim *et al.* (*5*) describe how through protein engineering wizardry, firefly and click beetle luciferases can be turned into luminescent reporters of the activities of a small ligand, of protein−protein interactions, or of enzymatic activities. The latter two manuscripts are noteworthy not only for the reporters introduced but also for laying out a path for the design of future luminescent reporters and for demonstrating how luminescent reporters can simultaneously detect multiple activities of a single ligand in one cell. Chemical biologists will surely continue to provide us with investigative reporters that deliver exciting news from distant places. Stay tuned.

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