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CORRECTION

Correction: Sensitive detection of protein ubiquitylation using a protein fragment complementation assay

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There was an error in *J. Cell Sci.* (2020) **133**, jcs240093 (doi:10.1242/jcs.240093).

In their article, the authors omitted to mention ubiquitin-mediated fluorescence complementation (UbFC), a method previously designed to probe the conjugation of ubiquitin or ubiquitin-like proteins (Ubls) to their substrates (Fang and Kerppola, 2004; Sung et al, 2013). UbFC and NUbiCA are similar in that both methods rely on a protein-fragment complementation assay to detect Ubl conjugation, but the reporters (fluorescent proteins for UbFC, the NanoLuc luciferase for NUbiCA) and assay conditions (live or fixed cells for UbFC, purified proteins for NUbiCA) are different. UbFC is appealing since it enables direct visualization of the subcellular localization of Ubl conjugates in living cells, which is not possible with NUbiCA. Yet, the irreversible assembly and slow maturation of fluorescent proteins (Hu et al., 2002; Kodama and Hu, 2012) precludes real-time monitoring of Ubl conjugation and deconjugation events, which may complicate the interpretation of UbFC results, especially for short-lived or dynamically modified conjugates. Other approaches based on FRET and BRET have also been devised to probe ubiquitylation of proteins in living cells, but their sensitivity has not yet been carefully assessed (Ganesan et al., 2006; Batters et al., 2010; Riching et al., 2018).

The authors apologise to readers for this omission, which does not impact the results or conclusions of the paper.

References

Batters, C., Zhu, H. and Sale, J. E. (2010). Visualisation of PCNA monoubiquitination in vivo by single pass spectral imaging FRET microscopy. *PLoS ONE* **5**, e9008. doi:10.1371/journal.pone.0009008

Fang, D. and Kerppola, T. K. (2004). Ubiquitin-mediated fluorescence complementation reveals that Jun ubiquitinated by Itch/AIP4 is localized to lysosomes. *Proc. Natl. Acad. Sci. USA* **101**, 14782-14787. doi:10.1073/pnas.0404445101

Ganesan, S., Ameer-Beg, S. M., Ng, T. T. C., Vojnovic, B. and Wouters, F. S. (2006). A dark yellow fluorescent protein (YFP)-based Resonance Energy-Accepting Chromoprotein (REACh) for Förster resonance energy transfer with GFP. *Proc. Natl. Acad. Sci. USA* **103**, 4089-4094. doi:10.1073/pnas.0509922103

Hu, C.-D., Chinenov, Y. and Kerppola, T. K. (2002). Visualization of interactions among bZIP and Rel family proteins in living cells using bimolecular fluorescence complementation. *Mol. Cell* **9**, 789-798. doi:10.1016/S1097-2765(02)00496-3

Kodama, Y. and Hu, C.-D. (2012). Bimolecular fluorescence complementation (BiFC): a 5-year update and future perspectives. *Biotechniques* **53**, 285-298. doi:10.2144/000113943

Riching, K. M., Mahan, S., Corona, C. R., McDougall, M., Vasta, J. D., Robers, M. B., Urh, M. and Daniels, D. L. (2018). Quantitative live-cell kinetic degradation and mechanistic profiling of PROTAC mode of action. *ACS Chem. Biol.* **13**, 2758-2770. doi:10.1021/acschembio.8b00692

Sung, M.-K., Lim, G., Yi, D.-G., Chang, Y. J., Yang, E. B., Lee, K. and Huh, W.-K. (2013). Genome-wide bimolecular fluorescence complementation analysis of SUMO interactome in yeast. *Genome Res.* **23**, 736-746. doi:10.1101/gr.148346.112