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Regulation of target proteins by small ubiquitin-like modifiers

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Propositions

1. Groups of SUMO target proteins act together in responding to Hydroxyurea induced DNA damage, so it is important to study groups of SUMOylated proteins that are functionally interlinked rather than single SUMO target proteins. (This thesis)
2. Although the method of employment of exogenously expressed and mutated SUMO2/3 is not perfect in identifying endogenous SUMO sites on proteins in the cell, it largely simplifies the complexity of samples for mass spectrometry analysis and allows identification of thousands of SUMO sites. (This thesis)
3. Upon MMC and HU treatment, two apical DNA damage response kinase ATM and ATR modulate hundreds of SUMO sites, which illustrates the possible involvement of these kinases to regulate the (de)SUMOylation machinery in the DNA damage response. (This thesis)
4. The low abundance of SUMOylated proteins and the redundant nature of SUMOylation on individual target proteins underlines the need for powerful SUMO proteomics approaches to uncover SUMO-regulated protein networks. (This thesis)
5. RAD51 is involved in two distinct pathways during DNA replication stalling causing DNA damage: to restart a stopped replication fork and to repair collapsed replication forks. (Petermann E et al. Mol Cell. 2010 Feb 26;37(4):492-502. doi: 10.1016/j.molcel.2010.01.021).
6. DNA damage stimulates a SUMOylation wave leading to modification of many repair factors. (Psakhye I et al. Cell. 2012 Nov 9;151(4):807-820. doi: 10.1016/j.cell.2012.10.021. Epub 2012 Nov 1).
7. Mapping endogenous SUMO sites in proteins is a potentially helpful tool towards the development of personalized therapies. (Hendriks IA et al. Nat Commun. 2018 Jun 25;9(1):2456. doi: 10.1038/s41467-018-04957-4.)
8. Deeper insights into the physiological function of SUMO modification in meiosis might be valuable to understand the DNA damage repair pathway involved in meiosis. (Cai L et al. MolCell Proteomics. 2017May;16(5):717727.doi:10.1074/mcp.M116.062125. Epub 2017 Mar 13.)
9. What makes life dreary is the want of motive. (George Eliot)
10. A man can fail many times, but he is not a failure until he begins to blame somebody else. (J. Burroughs)