Binding Interaction Analysis of Anticancer Saponin OSW-1 Using Biotinylated Probes

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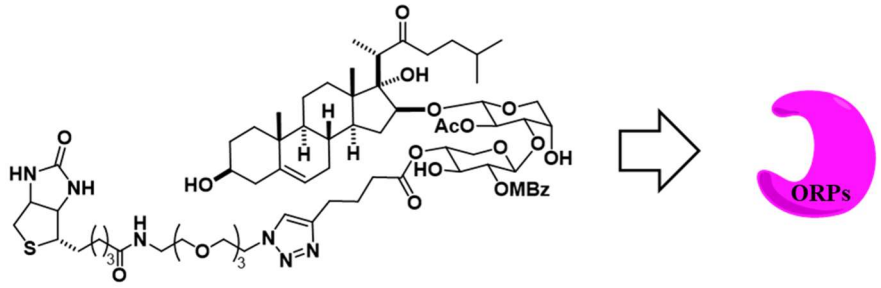
Keywords: Anticancer natural product, binding interaction, OSW-1, biotinylated probes, ORP family

OSW-1 is a steroidal saponin found in *Ornithogalum saundersiae*, which has attracted significant interest due to its highly potent and selective cytotoxicity against various cancer cells via a novel mechanism.[1,2] OSW-1 has been reported to target oxysterol-binding protein (OSBP) and OSBP-related protein 4 (ORP4), both of which are members of the OSBP-related protein (ORP) family.[2] Neither protein is indispensable for the cancer cell viability and therefore the anticancer mechanism of OSW-1 has not been fully explained by these interactions. Given that ORPs have a conserved C-terminal sterol/lipid-binding domain known as the OSBP-related domain (ORD)[3], it has been hypothesized that ORP members possess redundant functions and complement each other.

To investigate the possible interaction between OSW-1 and ORPs, we first analyzed the expression levels of ORPs in several cancer cell lines using western blot analysis. The results showed that the expression levels of most ORP family proteins varied across the cancer cell lines examined. Subsequently, we analyzed the binding interactions between ORPs and a biotinylated OSW-1 probe, previously developed by our group.[4] Detailed discussion of our assessment of these interactions will be presented.



Biotinylated-OSW-1 **Potential interaction?**

1) Y. Mimaki, M. Kuroda, A. Kameyama, Y. Sashida, T. Hirano, K. Oka, *Bioorg. Med. Chem. Lett.* **1997**, *7*, 633. 2) A. W. G. Burgett, T. B. Polsen, K. Wangkanont, D. R. Anderson, C. Kikuchi, K. Shimada, S. Okubo, K. C. Fortner, Y. Mimaki, M. Kuroda, J. P. Murphy, D. J. Schwalb, E. C. Petrella, I. C. Taracido, M. Schirle, J. A. Tallarico, M. D. Shair, *Nat. Chem. Biol.* **2011**, *7*, 639. 3) A. Pietrangelo, N. D. Ridgway, *Cell Mol. Life Sci.* **2018**, *75*, 3079. 4) M. N. Khine, N. Isogai, T. Takeshita, K. Sakurai, *ChemBioChem* **2025**, *26*, e202400923.

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