**POSTER 31: SUMOylation controls the AML surface proteome: role in immune response and development of innovative immunotherapies**

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Acute Myeloid Leukemias (AML) are severe hematomalignancies, that affect myeloid progenitors and hematopoietic stem cells. Despite ongoing improvements in AML therapies, it still carries a poor prognosis with frequent relapses (5-year survival <20%), highlighting the urgent need for new therapeutic breakthroughs. Our team has shown that SUMOylation plays a key role in AML response to therapies. Thus, targeting SUMOylation provides a promising approach for AML treatment by sensitizing them to therapies *in vitro* and *in vivo*. In particular, TAK-981, a first-in-class inhibitor of SUMOylation improves AML response to azaciditine (Aza), a DNA-hypomethylating agent largely used to treat AML patients unfit for standard chemotherapies. In addition, TAK-981 increases the expression of immune-cell activating ligands at AML surface and enhances NK cytotoxic activity.

Our aim is now to better understand how SUMOylation inhibition, in particular when combined with Aza, modifies AML cells surface proteome and modulate the anti-leukemic immune response. The first approach focuses on revealing changes in AML surface proteome upon inhibition of SUMOylation and DNA methylation using unbiased mass-spectrometry analysis. The second aims to identify surface proteins required for immune cells activation using CRISPR/cas9 screen of AML cocultured with peripheral mononucleated cells (PBMC) and/or purified NKs. Then, I will develop new immunotherapies approaches focusing on the surface proteins identified to regulate immune cell.

Altogether, this project will pave the way to the development of new therapeutic strategies based on immunotherapy to improve AML prognosis.