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**KEYWORDS** – Melanoma, immuno- and targeted therapy, drug resistance, tumor immune escape.

### MAIN FIELDS OF RESEARCH; ABSTRACT

Metastatic malignant melanoma is the deadliest form of skin cancer. In case of early detection, surgical removal and lymph node biopsy yields high patient survival. For advanced (metastatic) melanoma, the gold-of-standard approaches are MAPK- and immune checkpoint inhibitors, but median overall survival is still limited to 33.6% and 63%, respectively. On one hand, limitation to the use of MAPKi is resistance acquisition also in the responders cohort within eight months. On the other one, some of the major limitations to the use of immune checkpoint inhibitors are tumor heterogeneity, expression lack of specific biomarkers, the level of tumor-infiltrating lymphocytes (TILs), and induction of severe side effects. Lately, growing evidences highlighted the impact of epigenetic modifications on the switch from a epithelial (proliferative) to a mesenchymal (invasive) phenotype, which is a feature directly correlated to metastasis formation and drug resistance in melanoma and many other cancer types. Because of the evident need of finding new treatment approaches, we aim to use a selection of epigenetic inhibitors, which were either previously approved by the Food and Drug Administration (FDA) or that are involved in clinical studies, to investigate the impact of epigenetic reprogramming on melanoma surfactome, melanoma-associated secretome and melanoma invasiveness. On the basis of these results, we intend to find novel approaches to modulate melanoma surface features, its secretome or its invasiveness, possibly shedding new light on the epigenetic mechanisms that lead to treatment resistance and immune escape. Taken together, this project may contribute to enlarge the power of patient-based treatment personalization.

### SPECIAL TECHNIQUES AND EQUIPMENT

Beads-based screen assays for analysis of (melanoma) surface receptors and secretome, high-throughput flow cytometry, widefield microscopy.