Abstract ID: 93555

Student: Dey Saptaswa

Area of Research: Immunology, microbiome research and respiratory diseases

PhD Programme: PhD Molecular Inflammation (DK-MOLIN)

Semester: 12

Modified microbiota by skin disinfection through topical triple antibiotic treatment delays tumor growth and increases survival in a cutaneous T-cell lymphoma mouse model

Saptaswa Dey; Pablo Augusto Vieyra-Garcia; Aaroh Anand Joshi; Peter Wolf

Introduction: Cutaneous T-cell lymphomas (CTCL) are a heterogeneous group of lymphoproliferative disorders of skin-homing mature T-cells causing chronic inflammation, with an impairment of immune environment leading to severe infections and/or sepsis due to dysbiosis. Together, this promotes progression of disease, resulting in poor quality of life and high mortality. We were thus interested in microbiome characteristics of CTCL and if modulation of the skin microbiota could beneficially affect the course of CTCL. Methodology: Here we established a CTCL murine model by intradermally grafting murine EL4 T-cell lymphoma cells in C57BL/6 mice and treated them with conventional therapeutics such as psoralen plus UVA (PUVA) or UVB in the presence of normal microbiota or diminished microbiota achieved by disinfection with a topical triple antibiotic cream, containing neomycin, bacitracin and polymyxin B sulfate (Neosporin). Results: Our in vivo results indicated that skin disinfection significantly delayed tumor appearance and growth and prolonged survival of mice irrespective of allocation to therapeutic agents (PUVA, UVB or none). The effect of triple antibiotic cream on skin microbiota reduced Shannon diversity index and bacterial richness that correlated with diminished tumor growth. Moreover, it induced the growth of certain presumably beneficial staphylococcal species compared to vehicle treatment. Moreover, the effect of triple antibiotic cream on tumor growth was similar to the targeted therapy drugs, such as STAT3/5 blocker or multi-kinase inhibitor. Conclusion: In summary, we conclude that modifying the microbiota of the skin by disinfection through topical triple antibiotic treatment delays tumor growth and increases survival in a murine CTCL model. This observation opens up the avenues for the investigation of new therapeutic approaches in CTCL focusing on modification of the microbiota. Keywords: CTCL, Skin Microbiome, Tumor Growth