Nominee 1 to be approved by the Board

Michal Bassani-Sternberg (date of birth: 31.08.1978)
Oncology, University Hospital of Lausanne
Centre de recherche Agora
Rue du Bugnon 25A
CH-1011 Lausanne

Education & Training

11/2004 – 10/2009 Ph.D., Biology. Technion - Israel Institute of Technology, Haifa, Israel. Supervisor: Prof. Arie Admon. Dissertation title: "A novel methodology for cancer diagnosis based on analysis of the serum soluble HLA peptidome". Day of PhD defense: 26.10.2009
09/2002 – 10/2004 M.Sc., Biology. Technion - Israel Institute of Technology, Haifa, Israel. Supervisor: Prof. Shimon Gepstein. Master's thesis: "Molecular Growth Regulation in Plant Roots under Water Stress: Identification of Genes Associated with Root Growth and Draught Resistance".
09/2000 – 08/2002 B.A., Biology. Technion - Israel Institute of Technology, Haifa, Israel.

Positions & Employment

11/2021 – current Tenure-track assistant professor and the Faculty of Biology and Medicine, University of Lausanne (UNIL), on antigen discovery for personalized immunotherapy.
09/2015 – current Group Leader, Antigen Discovery Group, The Ludwig Institute for Cancer Research, Lausanne. Head of Immunopeptidomics Unit, The Center of Experimental Therapeutics (CTE) at the University Hospital of Lausanne (CHUV). https://www.unil.ch/dof/en/home/menuinst/our-research- groups/bassani-hi- tide.html
01/2012 – 08/2015 Postdoctoral fellow at the Proteomics and Signal Transduction department, Max Planck Institute of Biochemistry, Martinsried, Germany. Host: Prof. Matthias Mann. Identification of novel cancer related HLA-I peptides as targets for immunotherapy.
05/2010 – 11/2011 Postdoctoral fellow at the Faculty of Biology. Technion - Israel of Technology, Haifa, Israel. Host: Prof. Arie Admon. Designing and implementing our novel method for cancer biomarkers discovery among the soluble HLA peptides in the plasma of cancer patients.

Project title

Oncovirus-derived antigen discovery in human tumors for development of novel antigen-enriched and personalized adoptive T cell therapy

Summary

Oncoviruses are viruses that have the capacity to initiate cancer. Seven human oncoviruses are known, among them Epstein-Barr virus (EBV), human papillomavirus (HPV), and Merkel cell polyomavirus (MCV). Collectively they are responsible for 12-15% of human cancers worldwide. Most known oncoviruses are wide spread, yet only a small portion of infected individuals develop cancers and oncoviral infection itself is insufficient for tumorigenesis. The seven human oncoviruses are master immune evaders and they target various mechanisms including antigen processing and presentation, leading to downregulation of the human leukocyte antigen class I complexes (HLA-I) from the cell surface. On the other hand, T cell epitopes derived from oncoviruses are clonal, driver and immunogenic, and T cell mediated immunotherapy that can target specifically presented HLA bound peptides that are derived from viral proteins, benefits from the high tumor specificity. Furthermore, T cells are suitable for treatment of infected cells before they transform and also for eradication of malignant cells. Therefore, they are ideal targets for mounting immune responses and oncovirus-specific CD8+ and CD4+ TILs with tumor killing capacity have been identified.

At the Department of Oncology at the University Hospital of Lausanne an innovative adoptive cell transfer (ACT) phase I clinical trial has started across solid tumor types where mutated neoantigen-specific TILs are enriched and expanded in the presence of engineered professional antigen presenting cells and patient-specific neoantigenic peptides. In the context of the trial, our laboratory is responsible for performing personalized antigen discovery for each and for the prioritization of the most likely immunogenic neoantigens. In this study, we aim to explore the targeting of antigens derived from oncoviruses for inclusion in a similar ACT clinical trial. However, the canonical and non-canonical antigenic landscape of HLA bound peptides presented in tumors expressing onvoviruses, derived from the virus or the host proteome, is still largely unknown. In this study we aim 1) to map the HLA class I and HLA class II immunopeptidomes naturally presented in vivo across tumors expressing oncoviruses (mainly EBV, HPV and MCV) and in a collection of respective cancer cell line models, 2) to establish a high-throughput sensitive targeted-MS detection and quantification method for viral peptides and to explore synergistic drug combinations that can enhance oncoviral and tumor-specific peptide presentation, and 3) to identify immuno-dominant epitopes for enrichment and phenotypic characterization of endogenous oncoviral-specific T cells and their TCRs. Once identified, together with antigens from canonical sources, they may be developed into advanced immunotherapies.

Nominee 2 to be approved by the Board

Sylvain Peuget (date of birth: 09.09.1985),
Microbiology
Tumor and Cell biology (MTC)
Karolinska Institutet
Biomedicum, C8
Tomtebodavägen 16
SE-171 65 Solna

Education & Training

2012 PhD in Biology of Eukaryotes, Aix Marseille University, France
2008 MSc in Bioinformatics, Structural Biochemistry and Genomics, Aix Marseille University, France
2006 Maitrise (French degree equivalent to +4 years of study) in Microbiology, Aix Marseille University, France
2005 Bachelor in Biochemistry, Aix Marseille University, France

Positions & Employment

Since 2019 Assistant Professor, Dept of Microbiology, Tumor and Cell biology (MTC), Karolinska Institute, Sweden
2014-2018 Post-doctoral researcher, Selivanova's group, Dept of Microbiology, Tumor and Cell biology (MTC), Karolinska Institute, Sweden
2008-2013 PhD student, Cancer Research Center of Marseille (CRCM), INSERM; Aix-Marseille University, France

Project title

Exploring the links between oncogenic bacteria and cancer for innovative therapies

Summary

Since the recent years, it is known that the composition of the intestinal flora can influence multiple diseases, including cancer. Several studies have shown that the bacteria present in the gut of cancer patients are different than the flora of healthy individuals. Moreover, it has been shown that specific bacteria, such as Helicobacter pylori, can act as carcinogens and cause cancer. However, the exact molecular mechanisms of how bacteria influence cancer development are still not understood.
In this research project, we aim to understand how bacteria associated with tumors can affect our defenses against cancer. The main barrier against cancer in our body is the tumor suppressor gene named p53. Our hypothesis is that certain bacteria can prevent the normal function of p53, which then allows cancer development. Therefore, we will determine what are the molecular systems from the bacteria, which are involved and characterize how they affect p53 and alters the human cells to promote cancer. Understanding which molecules are affected will help us to identify new possibilities for therapy.

Despite all the knowledge we have acquired on colorectal cancer and the progress, which have been made for therapy, it is still a deadly disease. Hence, there is a need for new strategies to help patients. By understanding the relationship between gut bacteria and cancer, our goal is to find new possibilities for anticancer treatments, which could target the tumor itself but also the bacteria, which promote cancer.