Despite a great progress that has been made in clinical practice in the last years, pancreatic cancer remains an extremely aggressive cancer with a very poor outcome and high mortality rate. One of the reasons for difficulties in early recognition of tumor and its poor treatment efficacy is our incomplete knowledge about the pathogenesis of this cancer. Though there are numerous established risk factors predisposing to pancreatic cancer, including tobacco smoking, chronic pancreatitis, obesity, type 2 diabetes, and genetic predisposition that collectively account for about a half of all PDAC cases, we do not know why only a fraction of people with considerable risk factors finally suffers from pancreatic cancer. The most common mutation in pancreatic cancer is *K-Ras* point mutation, which is found in 95% of cases. However, our data from the animal models strongly indicate that *K-Ras* mutation is necessary but not sufficient to trigger pancreatic cancer development. Interestingly, environmental factors (inflammation, high fat diet) contribute to the promotion of pancreatic cancer. These data show complexity of carcinogenesis process. Recently, the role of the microbiota (microorganisms of gastrointestinal tract) has been postulated in the PDAC onset, as well as in the pathogenesis of obesity and type 2 diabetes.

Taking into consideration modulation of the immune system by microbiota, we hypothesized that oral and gastrointestinal tract microbiota may alter immune response to make host immunity tolerant to pancreatic cancer cells. In our opinion, these processes may be accompanied by altered dendritic cells function, which are the key players in sensitizing of immune system. Dendritic cells directly trigger and initiate responses by presenting exogenous antigens to T cells. Taken together, the microbiota composition and function of dendritic cells can be different among animals with the same genetic profile (mice with *K-Ras* mutation) with or without pancreatic cancer. Consequently, transplantation of “cancer-linked” microbiota into gastrointestinal tract of mice should accelerate the development of pancreatic cancer.

The results of this innovative study, with the use of transgenic mice with human *K-Ras* mutation, will significantly improve our knowledge about the role of environmental factors and mechanisms involved in pancreatic carcinogenesis, and may lead to the development of new methods of prevention and treatment. Identification of specific pathobionts involved in cancer development will guide us for future studies aimed at modulation of gastrointestinal microbiota (e.g. specific diet and/or novel probiotics) and manipulation of dendritic cells (e.g. vaccines). The analysis of blood circulating dendritic cells subset may be useful as a new diagnostic and/or prognostic factor in pancreatic cancer, that will allow for early tumor recognition with improvement of clinical outcome or identifying of patients at increased risk of pancreatic cancer development.