## （病態修復内科学）

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**研究内容**

生体の恒常性維持は、細胞の増殖、分化、細胞死によって制御され、悪性腫瘍や自己免疫疾患はその制御の破綻と捉えられる。

本講座では、各種造血器疾患、腫瘍、自己免疫疾患の発症原因を明らかにし、それを修復する治療の開発を試みる。白血病の源となる白血病幹細胞の同定、その駆逐技術の開発、同種および自己造血幹細胞移植による免疫反応やリンパ球の新生誘導などにより、悪性腫瘍や自己免疫疾患に対する新しい治療法の開発を試みている。さらにこれらの血液・腫瘍・免疫異常を基礎として発症する各種感染症の進展様式や治療法についても研究を進めている。

**指導内容**

（1）造血幹細胞の増殖、分化、細胞死の分子基盤の解明。
（2）造血幹細胞の腫瘍化メカニズムと白血病幹細胞の同定。
（3）悪性腫瘍の腫瘍化メカニズムと癌幹細胞の同定。
（4）造血幹細胞移植における免疫反応の解析。
（5）自己免疫疾患の発症メカニズムと新規治療法の開発。
（6）重症感染症の発症機序と進展様式の解明。

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**Research Interests**

The focus of our study is to understand the developmental mechanisms of cancer and autoimmune diseases, and to develop new treatment strategies for these disorders. In clinics, we performed hematopoietic stem cell transplantation for ~100 patients with hematopoietic malignancies. In previous studies, we have identified human hematopoietic stem cell subpopulations, and their downstream lineage-committed hematopoietic progenitors. Recent studies have shown that these stem and progenitor cells are targets of leukemia transformation. We are trying to identify cancer stem cells from various cancer tissues and leukemias in human, and to understand how the hematopoietic stem cell transplantation eventually eradicates cancer stem cells. To this end, we have developed killing antibodies that can specifically target cancer stem cells to apply our findings to the clinic. Hematopoietic stem cells are the source of all human immune systems including the autoreactive immune cells. We are also performing autologous hematopoietic stem cell transplantation in patients with autoimmune disorders and have success in restoring the normal immune reactions.

**Contents of Teaching/ Research Themes**

1) The basic technique to investigate hematopoietic stem cell biology
2) The isolation of leukemic stem cells and the methods to analyze their developmental mechanism
3) The isolation of cancer stem cells and the methods to analyze their developmental mechanism
4) Immune reactions after allogeneic transplantation
5) The developmental mechanism of autoimmune disorders and new treatment strategies for these disorders
6) The severe infections associated with hematopoietic stem cell transplantation