FUNDING PROGRAM FOR NEXT GENERATION WORLD-LEADING RESEARCHERS

Project Title: Search for the cells responsible fibrosis, regeneration and hormone secretion during kidney diseases	
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1.Background of research

One out of 10 adults in Japan are suffering from chronic kidney diseases (CKD), which is a progressive loss in renal function over a period of time. Once renal function deteriorates, it cannot be reversed by currently available treatment, and patients with severe CKD require renal replacement therapies.

There are various types of cells in the kidney, and our knowledge about these cells is limited.

2. Research objectives

In this project, I will search for the cells responsible for fibrosis and regeneration of the kidneys, and elucidate the mechanisms regulating these cells to develop therapeutic trials for CKD.

In addition to its excretory function, kidney has an endocrine function and secretes hormone which is indispensable to maintain our lives. During CKD, production of the hormone is reduced, and patients need the administration of the recombinant hormone repeatedly. I will also try to find the hormone-secreting cells, and analyze the behavior of the cells.

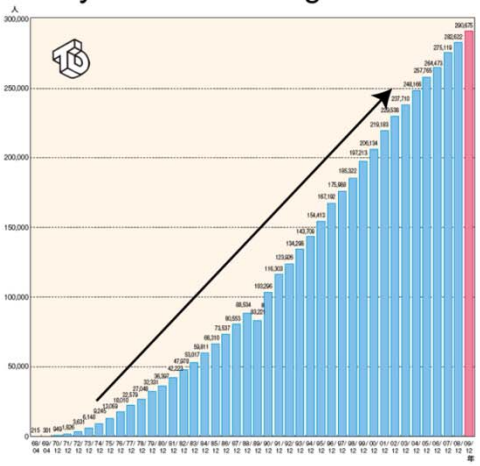
3. Research characteristics (incl. originality and creativity)

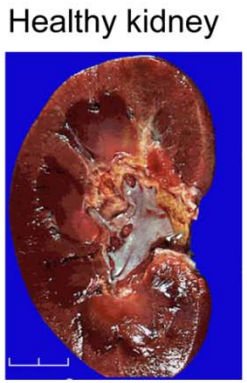
Utilizing genetically engineered mice, I already isolated these three types of cells for the first time.

4. Anticipated effects and future applications of research

Elucidation of the regulatory mechanisms of these cells will lead to the development of novel therapeutic trials regulating fibrosis and regeneration. Furthermore, the therapeutic trials targeting the hormone-secreting cells might be more effective and inexpensive compared to the repeated administration of recombinant hormone.

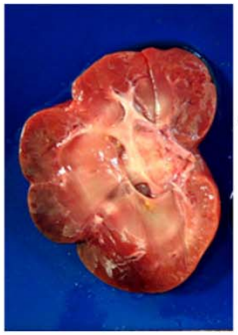
The number of patients on dialysis is increasing.



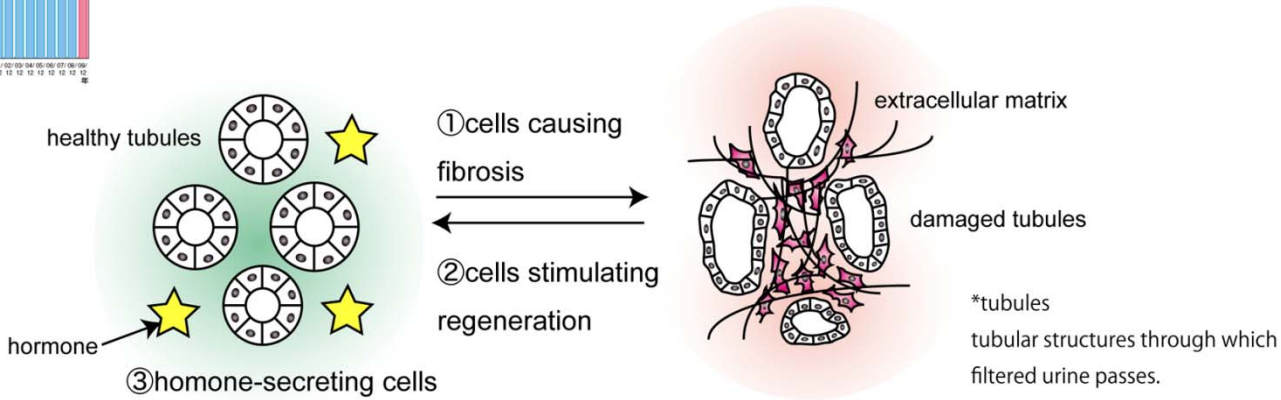


CKD

no therapies to reverse fibrosis



end-stage renal disease



In this project, I will try to find three important cells in the progression of CKD:
① cells causing fibrosis,
② cells stimulating regeneration, and
③ hormone-secreting cells.
Elucidation of molecular mechanisms regulating the cells will help the development of therapeutic trials for CKD.