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～リンパ組織におけるIL-7産生細胞の分布と機能～



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It was a great experience to attend the talk given by Professor Dr. Kuichi Ikuta (Institute of Virus Research, Kyoto University) organized by NM-GCOE Network, at 15th February 2010 in IDAC, Tohoku University. In his one hour talk entitled "Distribution and function of IL-7 expressing cells in lymphoid organs", Prof. Ikuta illustrated his intriguing exploration of IL-7, from its expression pattern, signaling pathway to functional importance. IL-7 is a cytokine indispensable for survival and proliferation of T/B lymphocyte precursor. It has a crucial role particularly in the $\gamma\delta$ T lymphocytes development, in which deletion of IL7R α causes total loss of $\gamma\delta$ T cells attributed to TCR γ rearrangement failure. It is not clear at present which cells secrete IL-7 in the lymphoid organs. Prof. Ikuta's group generated IL7-GFP-KI (knock in) mice to examine the location of IL-7 expressing cells. →

→ By immunofluorescence staining of BM with ERTR7 blood vessel marker, Prof Ikuta showed that the IL-7 expressing cells were expressed at the VCAM+ stromal cells surrounding the blood vessel. In thymus, IL-7 expressing cells were distributed throughout both mTEC and cTEC region, but a reduced expression was observed with aging. In peripheral lymph node, the expression of IL-7 was found in fibroblast reticular cells and lymphatic endothelial cells at subcapsular sinus region, while in spleen, IL7 expressing cells were limited to cells surrounding central arteriolar. Interestingly, in all organs examined including thymus, spleen, Peyer patches, skin, and small intestine, staining with LYVE1 showed IL-7 was highly expressed in the lymph ducts. This information is valuable to fully understand IL-7 secretion spatially, thus provide a step stone for further study of IL-7 functions in each organ. Other than in vivo GFP-KI system, an in vitro reporter system was also applied to examine IL-7 promoter activity in thymus mesenchymal stromal cells cocultured with DW34 pre-B cell line. →



⇒ Prof. Ikuta showed the interaction of stromal cells with pre-B cells drastically induced IL-7 in an IRF (interferon regulatory factor) transcription factor-dependent manner. In search for functional importance of IL-7, Prof. Ikuta's group generated IL-7 conditional knock out mice (IL-7^{flox/flox}FoxN1^{cre}) that limits the IL-7 deletion specifically in epithelial cells. IL-7^{flox/flox}FoxN1^{cre} mice demonstrated decrease of total, DN, DP and SP, and $\gamma\delta$ cells in thymus and in spleen, implying an indispensable role of epithelial cells derived IL-7 in the lymphocytes survival.

During question and answer session, questions were raised by audiences and mutual discussions took place, seeking the possibility to investigate the following: TCR signaling crosstalk with IL-7 signal, generation of mouse harboring IL-7 deletion in lymph duct cells, IL-7 expression before and after immunization, in vivo interaction of IL-7 expressing stromal cells with pre B cells, a closer look into the IL-7 regulatory region, and identification of which IRF family member is the main regulator of IL-7 transcription. In my humble opinion, this talk enables most current scientific data sharing and inter-institutional communication that benefited both the speaker and audiences. I personally appreciated this opportunity to listen to and learn from Prof. Ikuta's talk. I sincerely hope that similar type of seminar will be held more frequently in the future.



質疑☆
あれこれ



佐竹先生による講師紹介

大学院生の感想

- リンパ球分化に必要な「 $\gamma\delta$ 」がどの細胞から産生されているのか明確ではなかったことに驚きました。リンパ管内皮が発現する「 $\gamma\delta$ 」の働きや、胸腺に発現する「 $\gamma\delta$ 」と胸腺退縮との関係等、今後の発展が楽しみな研究でした。
- 今日のセミナーでは、「 $\gamma\delta$ 」について詳しく学ぶことが出来ました。「 $\gamma\delta$ 」に関して、どの細胞が産生しているかや「 $\gamma\delta$ 」産生のシグナル経路がよくわかっていないなどの問題に対する先生のアプローチの仕方も非常に面白く聴かせていただきました。
- 「 $\gamma\delta$ 」のノックインマウスを用いてあらゆる組織における「 $\gamma\delta$ 」の分布を見る実験はとても面白いと思いました。
- 私は免疫に関して詳しくないのですが、大変丁寧でわかりやすく説明していただきました。
- 「 $\gamma\delta$ 」の組織内局在を大変興味深く拝聴しました。生田先生と他の先生方の最後のディスカッションはとても熱く、刺激的なセミナーでした。

