

論文 / 著書情報
Article / Book Information

題目(和文)	腸内細菌代謝産物による腸上皮免疫の昼夜リズム調節
Title(English)	Circadian rhythm regulation in intestinal epithelial immunity by intestinal bacterial metabolites
著者(和文)	DUYAO
Author(English)	Yao Du
出典(和文)	学位:博士(学術), 学位授与機関:東京工業大学, 報告番号:甲第12825号, 授与年月日:2024年6月30日, 学位の種別:課程博士, 審査員:折原 芳波,梶原 将,小畠 英理,黒田 公美,小倉 俊一郎,柘植 丈治
Citation(English)	Degree:Doctor (Academic), Conferring organization: Tokyo Institute of Technology, Report number:甲第12825号, Conferred date:2024/6/30, Degree Type:Course doctor, Examiner:,,,,,
学位種別(和文)	博士論文
Category(English)	Doctoral Thesis
種別(和文)	要約
Type(English)	Outline

論文要約

Circadian rhythm plays an important role in the homeostasis and the immune function. Circadian rhythm dysregulation was reported to induce intestinal microbiota dysbiosis, which further leads to intestinal barrier disruption and triggering intestinal inflammation. However, the relationship between intestinal microbiota metabolites and the circadian rhythm in the intestinal immune system was still unclear. This study aimed to explore the effect of intestinal microbial metabolites on the circadian rhythm in the intestinal immune system. This study confirmed that the improvement of microbial metabolites by inulin intake can affect the expression rhythms of *MUC2* and *CXCL8/IL8* in intestinal epithelial cells. In addition, another microbial metabolite was found to influence on the expression rhythm of the clock genes *BMAL1* and *PER2* in intestinal epithelial cells as well as in a mouse intestine. Furthermore, the study investigated the effects of the microbial metabolite on the expression rhythms of mucins and tight junctions, all the rhythms were found to be disrupted by inflammation. Finally, using antagonists, AhR and Nrf2 signaling pathways was confirmed to be involved in this microbial metabolites' effect on the circadian rhythm in intestinal epithelial cells. This study confirmed a strong relationship between intestinal microbial metabolites and the circadian rhythm of the intestinal epithelial immune system. Moreover, this study highlighted the potential of intestinal microbial metabolites in treating diseases like IBD by improving the dysregulated circadian rhythms in the intestinal immune system.