SOKENDAI

Course title	Regulation of Biological Function 2		
Term	前期 1st Half		
Credit(s)	1		
The main day		The main period	
Program/Department	48 Physiological Sciences		
Lecturers	Hasebe, Yamasaki, Nishida, Nishimura et al.		
成績評価区分 Grading Scale	A,B,C,Dの4段階評価 Four-grade evaluation		
レベル Level	Level 3		
力量 Competence	専門力 Academic expertise、独創性 Creativity		

Instructor
Full name
* NISHIJIMA KAZUTOSHI

Outline	Learn basic knowledge about the cardiocirculatory system, immune system, lipid metabolic system, and stem cell regulatory system, all of which are important for maintaining homeostasis in the body through eight lectures.
Learning objectives	1) Understand the physiological and pathophysiological functions of the cardiovascular system. 2) Understand autoimmune diseases and neuroimmunity related diseases. 3) Understand lipid metabolism and dyslipidemia. 4) Understand regulatory mechanism of stem cell function.
Grading policy	・Attendance of at least half of the lectures is required for credit. ・A summary report on one of the lectures must be submitted. The instructor of the lecture will grade the submitted report based on the level of understanding of the lecture. Grades are assigned as follows: A (80-100 points), B (70-79 points), C (60-69 points), and D (below 60 points). A score of 60 or above is required to pass. How to submit report ・Physiological Sciences course students: refer to "https://sites.google.com/nips.ac.jp/sokendaiadm/" ・Others: submit by e-mail (sokendai-adm@nips.ac.jp) Report submission deadline: End of July
Lecture Plan	Fridays from 10:00 to 11:30 AM, April to July 2026, as outlined in the course schedule below. April 17: Pathogenesis of autoimmune diseases and neuro-immune interaction (Rie Hasebe), April 24: Mechanisms of tissue specific inflammatory diseases via neuroimmune interactions (Takeshi Yamasaki) May 22: Regulation of cardiovascular functions through multi-cellular interactions (Tomohiro Nishida) May 29: Regulation of cardiocirculatory functions by organ-organ interaction (Akiyuki Nishimura) June 12: Molecular Pathophysiology of Pain: from sensory neurons to brain (Makoto Tominaga) June 19: Molecular Mechanisms of Thermosensation and Thermoregulation (Takaaki Sokabe), July 3: Lipid metabolism and dyslipidemia (Kazutoshi Nishijima) July 10: Regulatory mechanism of stem cell function (Toshihiro Kobayashi)
Location	Zoom-online
Language	English
Textbooks and references	1) Hasebe, R. Tanaka, H. Yamasaki, T. Murakami, K. Murakami, M. Neural signaling in immunology: the gateway reflex. Int Immunology, 37(7): 369-377. 2025. doi: 10.1093/intimm/dxaf009. 2) Hasebe, R. Murakami, K. Harada, M. Halaka, N. Nakagawa, H. Kawano, F.Ohira, Y. Kawamoto, T. Yull, FE. Blackwell, TS. Nio-Kobayashi, J. Iwanaga, T. Watanabe, M. Watanabe, N. Hotta, H. Yamashita, T. Kamimura, D. Tanaka, Y. Murakami, M. ATP spreads inflammation to other limbs through crosstalk between sensory neurons and interneurons. J Exp Med, 219(6): e20212019. 2022. doi: 10.1084/jem.20212019. 3) Arima, Y. Harada, M. Kamimura, D. Park, JH. Kawano, F. Yull, FE., Kawamoto, T., Iwakura, Y. Betz, YAK. Márquez, G. Blackwell, TS. Ohira, Y., Hirano, T. Murakami M. Regional neural activation defines a gateway for autoreactive T cells to cross the blood-brain barrier. Cell, 148(3): 447-57. 2012. doi: 10.1016/j.cell.2012.01.022. 4) Physiology of the Heart 5th Edition by Arnold M Katz 5) Lam C.S.P. et al., Recent successes in heart failure treatment. Nature Med, doi: 10.1038/s41591-023-02567-2 6) Principle of Neural Science 6th edition, Kandel et al. Ed. Chapter 20 'Pain' 7) Kashio, M. Thermo-TRP regulation by endogenous factors and its physiological function at core body temperature. Physiol Rep, 13(1): e70164. 2025. 8) Montell, C. Drosophila sensory receptors-a set of molecular Swiss Army Knives. Genetics, 217(1): 1-34.2021. 9) Sokabe, T. (2026). 3.04 - Insect TRP channels and receptors in physical and chemical sensation. Comprehensive Molecular Insect Science (Second Edition). N. Yamanaka and P. W. Atkinson. Oxford, Elsevier: 126-167. 10) The Johns Hopkins textbook of dyslipidemia; editor, Peter O. Kwiterovich Jr. Kwiterovich, Peter.
Notes for students of other programs	Students from courses other than the Physiological Sciences course should contact the Graduate School Office at the National Institute for Physiological Sciences (sokendaiadm@nips.ac.jp) before enrolling.
Related URL	https://www.nips.ac.jp/graduate/curriculum.html
Explanatory note on above URL	Please check the Physiological Sciences course website for the latest schedule. This course is highly recommended for first- and second-year doctoral students in Physiology. Students from other programs are also encouraged to enroll.
Contact for Course Inquiries	Kazutoshi Nishijima kanish@nips.ac.jp