Syllabus

1. Course title, style, and credit
   Epithelial cell biology
   Lecture
   1 credit

2. Appropriate grade level and eligible departments
   All departments
   For Department of Physiological Sciences, D1, 2 (obligatory), D3-5 (optional)

3. Lecturers
   Mikio Furuse
   E-mail: furuse@nips.ac.jp
   TEL: 0564-59-5277 FAX: 0564-59-5275
   NIPS (Yamate)

4. Time
   [Oral]
   April 15, 22
   May 13, 20, 27
   June 1, 10, 24
   10:00-12:00 on Friday (except June 1, Wednesday)

5. Place
   2F Seminar Room in the west side of Yamate No. 2 Building.

6. Prerequisites and styles
   This course has no prerequisites. The oral lectures are given in English.

7. Contents
   Epithelium is a tissue of a continuous sheet composed of cells that cover body surfaces, cavities and tubes. Epithelium is contained in most of the organs and is involved in a wide variety of physiological functions. Epithelium consists of epithelial cells, which have common characteristics of cell polarity and cell-to-cell adhesion. On the other hand, epithelial cells have diversity in the structure and biochemical property to perform organ-specific functions. In this course, we will introduce the molecular mechanisms of the structure, function and behavior of epithelial cells, based on the updated knowledge in cell biology and physiology. We will also discuss how the basic properties of epithelial cells and their variations are utilized for the functions of organs.

8. Course objectives
   1. To understand the molecular mechanism underlying the morphogenesis of polarized
epithelial cells.
2. To understand the molecular mechanism underlying the epithelial transport, which contributes to homeostasis.
3. To understand various functions of epithelia.

9. Schedule
1. April 15
   Introduction to epithelium
   Mikio Furuse (NIPS)
2. April 22
   Establishment of epithelial cell polarity
   Yasushi Izumi (NIPS)
3. May 13
   Intracellular transport in epithelial cells
   Tetsuhisa Otani (NIPS)
4. May 20
   Epithelial morphogenesis
   Tetsuhisa Otani (NIPS)
5. May 27
   Regulation of paracellular transport and epithelial barrier function
   Mikio Furuse (NIPS)
6. June 1 (Wed)
   Regulation of intestinal epithelial transport: Intestinal fluid and electrolyte movement
   Atsukazu Kuwahara (University of Shizuoka)
7. June 10
   Epithelial cells in the brain
   Kazunobu Sawamoto (Nagoya City University)
8. June 24
   Barrier function of stratified epithelia
   Takeshi Matsui (RIKEN)

10. Lecture materials and readings

11. Grades
    The lecturer will present a theme based on the course objective at the end of the course. Students are requested to submit an essay report on the theme by the dead line. The grade will be determined by the quality of the report, and will be either “passed” or “failed”.

12. Notes
    Nothing particular