Prerequisite: LSM3223
Workload: 30 lecture hours + 20 tutorial hours

Course description:
The objective of this course is to provide students with a current and up to date view of immunology. Breakthrough areas will certainly vary from year to year, but the broad subject matter will remain. Among the highly competitive areas of immunology research, the course focuses on innate immunity, dendritic cell biology, antigen processing and presentation, lymphocyte development and differentiation, induction of tolerance, mechanism of autoimmunity and allergy, host pathogen interactions and tumor immunology.

1. Innate immunity – complement activation, antimicrobial peptides, and phagocytes in innate immunity. Phagocytic receptors and mechanisms of pathogen killing inside phagosomes.
   - Toll-like receptors – overview, structure, specificity, signaling and adjuvant role in the induction of adaptive immunity.
   - Dendritic cells – immunobiology and activation.
   - Natural killer cells – NK activation, NK cell mediated cytotoxicity, and NK cell cross-talk with other cells.

2. Lymphocyte development - hematopoietic stem cell biology, the development of central tolerance.
   - Antigen presentation - antigen processing, antigen loading, MHC binding selection, and cross presentation.
   - T cell subsets – Th1, Th2, Th17 and Treg differentiation, molecular characteristics, effector mechanisms.

3. Viral Immunity
   - Mucosal immunity and microbiome
   - Tumor immunology and immunotherapy
   - Autoimmunity and tolerance
   - Allergy
   - Transplantation

4. Tutorials: Each group of students will be assigned a cutting edge journal article from a topic for oral presentation. There will be a maximum of 10 groups. Tutorial hours include two class practice sessions on critical reading of literature and art of writing critiques, group presentations and class discussion as well problem based learning.

READING MATERIAL: Journal articles and Reviews will be provided.

MODE OF ASSESSMENT:
30% Continuous Assessment
70% Final Examination
MODULE CO-ORDINATORS:
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LECTURERS:

Semester I
A/P Veronique Angeli (MC)
Prof Nicholas Gascoigne
A/P Ren Ee Chee
A/P Zhang Yongliang
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A/P Paul MacAry

Semester II
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A/P Herbert Schwarz
A/P Liu Haiyan