Lecture Series "Riron": C3 Metabolic and Circulatory Regulations **Subject Code 20120**

(Elective: 2 credits)

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【Objectives】

Metabolic and Circulatory Regulations aim at learning the following items, (1) the pathogenesis of acute coronary syndrome and related factors, (2) the mechanism of expressions in atherogenic molecular markers in endothelial cells and vascular smooth muscle cells, (3) the pathogenesis of metabolic disorders including diabetes mellitus and diabetic vascular complications, and its therapeutic strategy, (4) the molecular mechanism of effects or secretion of insulin, (5) the molecular mechanism and therapeutic strategy for metabolic syndrome and the development of obesity, (6) the relation between the progression of atherosclerosis or obesity, and inflammatory cells, (7) the physiological renal function, the functional differentiation and regulation in each segment of nephron, (8) the pathogenesis of major renal diseases and the underlining mechanisms causing the pathological conditions, (9) influence and the mechanism of the operative stress to the metabolism and circulation, and therapeutic strategy for controlling these influences.

【Content Description】

1. In this lecture, you are expected to learn the followings:
(1) Platelet activation, and the coagulation and fibrinolytic biomarkers in acute coronary syndrome;
(2) Basic mechanism of myocardial ischemia / reperfusion injury and cardiac remodeling in experimental acute myocardial infarction ;
(3) Mechanism of expressions in atherogenic molecular markers in endothelial cells and vascular smooth muscle cells;
(4) Pathogenic mechanism of diabetes mellitus, diabetic complications, effects and secretion defect of insulin;
(5) Molecular mechanism and therapeutic strategy for metabolic syndrome and the development of obesity that is one of the main pathogenesis of atherosclerotic diseases;
(6) Detailed molecular structure, channels and receptors, and the regulation of nephron;
(7) Functional renal changes to the renal blood flow and blood pressure, and the pathogenic mechanism of proteinuria and renal dysfunction;
(8) Various influences by operative stress (i.e. activation of sympathetic nervous system, pain, inflammatory reaction, etc) to the metabolism and circulation, and therapeutic strategy in based on understanding these influences.

【Keywords】 acute coronary syndrome, plaque rupture, ischemia /reperfusion injury, atherosclerosis, vascular endothelial cells, diabetes mellitus, insulin, diabetic complication, reactive oxygen species, metabolic syndrome, obesity, inflammation, nephron, hypertension, V2 receptor, nephrotic syndrome、operative stress, pain, etc.

【Class Style】 PowerPoint and/or OHP will be used in the lectures, and active participation in the discussion is encouraged. Extra classes or video lectures are considered for those who are regularly absent for unavoidable reasons.

【Textbooks】 Textbooks are not specified, and handouts will be distributed.

【Recommended Readings】

- "Braunwald's Heart Disease: A Text of Cardiovascular Medicine, Eight edition" edited by Libby P et al. Saunders Press, Philadelphia, 2007.
- "Miller's Anesthesia, sixth edition" edited by Miller RD. Elsevier Churchill Livingstone, Philadelphia, 2005.
- "Brenner & Rector's The Kidney 8th edition, Sounders
- Comprehensive Clinical Nephrology 3rd edition, Mosby

【**Office Hour**】 If you have any questions on topics or schedule of the classes, please contact the instructors listed above.

【**Evaluation for Grades and Credits**】 Grading will be based on active class participation, paper summaries, and the final report.

【**Lecture Schedule**】 Please also refer to the timetable shown in the Section 5.

The sessions marked with "e" are under preparation of e-learning contents. In some cases, the session that is not marked with "e" will be done by utilizing e-learning system, as soon as the e-learning contents are ready for use. Therefore, you must check the updated syllabus cited on the home page of the Graduate School of Medical Sciences, Kumamoto University to check the current status of the session before you take a session. If you cannot obtain enough information from the home page, please make contact with the instructors of the sessions.

There are six types of e-learning, those marked with "eE0", "eEL", "eJ0", "eJL", "eEJ-0"and "eEJ-L". To know the meanings of these six markings and to learn how to use e-learning system, please see the section explaining about the e-learning system in this syllabus.

Session	Date & time		Instructors	Topics
1.	Oct 16 (Fri)	5th period	Seigo Sugiyama	Vascular endothelial dysfunction and cardiovascular disease
2.	Oct 23 (Fri)	5th period	Koichi Kaikita	Mechanism of myocardial ischemia / repefusion injury
3.	eE-O Oct 30 (Fri)	5th period	Hisao Ogawa	Platelet activation, coagulation and fiblinolysis in acute coronary syndrome
~~4.~~	~~Nov 6 (Fri)~~	~~5th period~~	~~Eiichi Araki~~	~~Pathogenesis and therapies in metabolic disorders~~
5.	eE-O Nov 13 (Fri)	5th period	Eiichi Araki	Insulin and its action –their molecular basis
6.	Nov 20 (Fri)	5th period	Tatsuo Yamamoto	Types and influences of operative stress
7.	eE-O Nov 27 (Fri)	5th period	Eiichi Araki	Diabetic complications and their therapeutic approaches
8.	Dec 4 (Fri)	5th period	Tatsuo Yamamoto	Physiological mechanism of influences by operative stress
9.	Dec 11 (Fri)	5th period	Tatsuo Yamamoto	Therapeutic strategy controlling operative stress
10.	Dec 18 (Fri)	5th period	Kimio Tomita	Structure and function of nephron
11.	Dec 25 (Fri)	5th period	Kimio Tomita	Renal function and blood pressure
12.	Jan 8 (Fri)	5th period	Kenichiro Kitamura	Mechanism of proteinuria
13.	Jan 15 (Fri)	5th period	Tomomi Gotoh	NO and nitrogen metabolism
14.	Jan 22 (Fri)	5th period	Tomomi Gotoh	ER stress-related diseases
15.	Jan 29 (Fri)	5th period	Yuichi Oike	Metabolic syndrome