

ARTIFICIAL CELLS – PHGY 518

Fall 2011

Starting Tuesday, September 6, 2011 from 4:00 – 6:00 p.m.

McIntyre Medical Sciences Building, Room 1101

Course supervisor: Professor T.M.S.Chang (artcell.med@mcgill.ca)

Course co-supervisor: Professor Satya Prakash (satya.prakash@mcgill.ca)

| <u>DATE</u> | <u>TIME</u> | <u>TOPIC</u> | <u>LECTURER</u> |
|-------------|-------------|---|-----------------|
| Sept. 6 | 4-6 pm | Artificial Cells: Principles & Examples | Dr. T.M.S Chang |
| Sept. 13 | 4-6 pm | Artificial Cells: Nanobiotechnology of Blood Substitutes | Dr. T.M.S Chang |
| Sept. 20 | 4-6 pm | Artificial Cells:Nanomedicine,enzyme,cell & stem cell Therapy | Dr. T.M.S Chang |
| Sept. 27 | 4-6 pm | Literature search and Library projects on Artificial Cells for seminars | |
| Oct. 4 | 4-6 pm | Tissue Engineering of Cardiovascular Structures | Dr. D. Shum-Tim |
| Oct. 11 | 4-6 pm | Bacterial Biofilm | Dr. R.F. Gagnon |
| Oct. 18 | 4-6 pm | Dialysis | Dr. P. Barre |

SEMINAR: 6 two-hour sessions below related to examples of ARTIFICIAL CELLS: for Nanomedicine, Nanobiotechnology, Regenerative Medicine, Cell and Stem Cell Therapy, Enzyme Therapy and other areas.

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|---------|---|----------|-------------|
| Oct. 25 | 4-6 pm | Seminar: | Dr. Prakash |
| Nov. 1 | 4-6 pm | Seminar: | Dr. Prakash |
| Nov. 8 | 4-6 pm | Seminar | Dr. Chang |
| Nov10. | <i>The deadline for submission of term papers as an email attachment to Dr. T.M.S. Chang</i> | | |
| Nov. 15 | 4-6 pm | Seminar: | Dr. Chang |
| Nov. 22 | 4-6 pm | Seminar | Dr. Liu |
| Nov 29. | 4-6 pm | Seminar. | Dr. Liu |

McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see <http://www.mcgill.ca/integrity> for more information).

The Department of Physiology will not tolerate any academic offences with regard to cheating and plagiarism. See “Handbook of Student Rights and Responsibilities” at <http://www.mcgill.ca/integrity/students> for details.

In accord with McGill University’s Charter of Students’ Rights, students have the right to submit in English or in French any written work that is to be graded (except in courses where knowledge of a language is one of the objectives of the course).

In the event of extraordinary circumstances beyond the University’s control, the content and/or evaluation scheme in this course is subject to change.

ARTIFICIAL CELLS: AN ADVANCE COURSE 518a INFORMATION AND REQUIREMENTS

(given at the beginning of class and posted on www.artcell.mcgill.ca)

This information can also be found on: www.artcell.mcgill.ca Under “Teaching” Click on subheading “artificial cells” Password for 1st window:518a2003 For 2nd window just click “read only”. Please check this link frequently for updates including seminar assignments and term paper assignments

PLANS FOR THIS ADVANCE COURSE (see time table of schedule):

This advance course is to give the class an overview of this large and interdisciplinary area. It will start by lectures to give the students sufficient basic background,. After this, the students will be able to learn how to obtain up to date materials on their own from the internet and the library.

- (1) The class will start by reading assigned material on this topic from the website www.artcell.mcgill.ca and the first chapter of the 2007 book. These assigned materials are of a general nature written for general scientists and the public,
- (2) The first 3 two-hour lectures on Artificial Cells are more advance and they will introduce the class to the basic advance principles of artificial cells.
- (3) This will be followed by 3 two-hour lectures on important related area. Each will be given by specialist in the area from McGill’s teaching hospitals. This period will also allow the students time to read and prepared for the seminars on Artificial Cells.
- (4) Seminars on Artificial Cells. These are detailed presentations of the different aspects of artificial cells that follow the first 3 two-hours of introductory lectures on artificial cells. Six two-hour sessions relate to examples of ARTIFICIAL CELLS for nanomedicine, nanobiotechnology, regenerative medicine, cell and stem cell therapy, enzyme therapy and other areas. The material for these seminars will come from different chapters in the 2007 book on artificial cells. All students will be responsible for these materials. The class will be randomly asked to answer questions or to discuss certain areas related to the assigned reading for each seminar.
- (5) Term paper: Students will be assigned term paper on topics related to artificial cells. The term paper should include (1) Introduction and historical review (2) Recent research based on lecture material, 2007 books, www.artcell.mcgill.ca website PLUS summary of 4 key papers on the assigned topic – if possible, one from each year published between 2008-2011 that **the student should select independently on his/her own.** (3) General discussions, conclusions and future research based on your own views of (1) and (2) above.

REQUIREMENTS FOR THIS ADVANCE COURSE:

You are responsible for knowing the following material:

- (1) Lecture materials
- (2) Sections on 2007 book on Artificial Cells assigned for all the seminars.
- (3) Related details on Website www.artcell.mcgill.ca It is the key reference source for artificial cells around the world.

This is an advance course on the basic principles and recent advances in the area of artificial cells. Based on student feedback, the major problem faced by previous classes is that this is a highly interdisciplinary area. As a result it is difficult for anyone to gather all the information needed for this course. There is now a 454 page 2007 monograph by TMS Chang on “ARTIFICIAL CELLS: biotechnology, nanomedicine, regenerative medicine, blood substitutes, bioencapsulation and cell/stem cell therapy” This has been published by the World Science Publisher (The official publisher of Nobel Prize Award Lectures from 1921 to now.) The publisher has given author the right to place this book on his website for all to read without cost starting April 2010. The author has also donated 4 copies of this book on the reserve shelf in the McIntyre Medical Sciences Library for the class. The publisher has published both a hard-cover and a lower soft-cover form of the book. The later may still be available at the McGill Book store.

EVALUATION TO BE USED IN THIS ADVANCE COURSE:

(1) 45% Term paper (45%): Students will be assigned term paper on topics related to artificial cells. The term paper should include (1) Introduction and historical review (10%) (2) Recent research results based on lecture material, 2007 books, www.artcell.mcgill.ca website PLUS summary of 4 key papers on the assigned topic published between 2008-2011 that the student should select independently on his/her own (20%) (You can find these key papers by searching the website including www.artcell.mcgill.ca, the journal of “artificial cells, blood substitutes and biotechnology” that is available in the medical library and other journals like Nature Medicine, Nature Biotechnology etc.) (3) General discussions, conclusions and future research (15%) based on your own views of (1) and (2) above. The term papers should be submitted as e-mail attachments of not more than 1 megabyte, to Professor TMS Chang at artcell.med@mcgill.ca. **The deadline for submission to Professor Chang as email attachment (maximal size of 1 megabyte) is 10th Nov 2011.**

(2) 35% based on seminar presentation: topics to be assigned later. Each presentation will be a detailed presentation and discussion of specific assigned materials from the 2007 book on artificial cells plus the 4 key papers on the assigned topic – if possible, one from each year published between 2008-2011. Grades will be based on presentation and answers to questions related to the assigned material for the seminar presentation. Time allotted for actual presentation 25 mins. Please keep to this time. This will be followed by (1) 5 min questions by the lecturer to the presenter then (2) 10 min questions by the lecturer to the class on a randomized basis

(3) 20% : participation and answer to questions by the rest of the class during seminar presentations The rest of the class will be responsible for assigned material from the 2007 book for each of the seminar presentation. Their knowledge will be tested by random questions on related topics during each of the seminars. **Attendance, participation and answer to questions in all the seminars will account for the 20%.** Please be sure to sign your name on the name sheet for each of the seminar. Please start with your name when answering questions.

Seminar and term paper assignments will be given at a later date