Vitesse Inter-Disciplinary Study Program

BIOLOGY for BIOPHOTONICS

February 23-27, Ottawa, Ontario

This program covers the following topics:

Biological Systems: from Molecules to Organisms
- The cell: nuclear structure and function - DNA and RNA
- The cell: Cytoplasmic structure and function, proteins and signal transduction, enzymes and their functions
- Tissue and organ systems: introduction to disease biology

Principles of Photobiology

Fundamentals of Biotechnology: from DNA to Proteomics

The Interface of Biomedical Sciences and Optics
- Bioimaging at cellular and tissue levels
- The biological aspects of optical biosensing
- Light-activated therapy
- Nanobiophotonics, Nanomedicine and biomaterials

Cellular and Sub-Cellular Imaging and Clinical Treatment by Means of Nonlinear Optics Techniques
- Biological structures: multi-photon phenomena and fluorescence microscopy specifics
- Cellular and sub-cellular functions, morphology and pathology imaging by second harmonic, hyper-Rayleigh, hyper-Raman effects and by two-photon fluorescence correlation spectroscopy
- The biological aspects of two-photon photodynamic therapy

Biophotonics Instrumentation: How the Nature of Biological Samples Influences Instrumentation Design Solutions

Problem Solving Based Learning Sessions (evenings)
- Discussion of recently published articles and participants' raised topics

Attendee Profile
- Physical scientists and engineers as well as biomedical engineers and researchers
- PhD students and post-doctoral fellows
- Little or no understanding of biology or biological systems
- Desire for a familiarization with basics concepts in biology and explore new inter-disciplinary opportunities

Benefits
- A comprehensive initiation in biology and biotechnology
- Acquire knowledge of the biological aspects of biophotonics applications
- Explore the transfer of applied science concepts/techniques to biological systems
- Apply acquired knowledge to real life examples (problem based learning sessions)
- Possibility for career advancement into the fields of biology/medicine and biophotonics
- Opportunity to network, exchange knowledge and experiences

To register visit: www.vitesse.ca or contact Dr. Stoyan Tanev, Program Manager, Vitesse™ Re-Skilling Canada Inc., Tel. 613-746-3595 ext. 228, stoyan.tanev@vitesse.ca

BIOLOGY for BIOPHOTONICS: **Detailed program**

Time	**Monday, Feb. 23**	**Tuesday, Feb. 24**	**Wed., Feb. 25**	**Thursday, Feb. 26**	**Friday, Feb. 27**
8:00 am – 8:30 am		Breakfast	Breakfast	Breakfast	Breakfast
8:30 am - 12:00 am		**Brian Wilson**, *Principles of Photobiology*	**Dominic Bergeron**, *Fundamentals of Biotechnology: from DNA to Proteomics*	**Paras Prasad**, *The Interface of Biomedical Sciences and Optics - II*	**David Cramb**, *Cellular and Sub-Cellular Imaging and Clinical Treatment by Means of NLO Techniques*
12:00 am – 1:00 pm		Lunch	Lunch	Lunch	Lunch and conclusion
1:00 pm -5:00 pm	**Douglas Gray**, *Biological Systems: from Molecules to Organisms - I*	**Douglas Gray**, *Biological Systems: from Molecules to Organisms - II*	**Paras Prasad**, *The Interface of Biomedical Sciences and Optics - I*	**Rejean Munger**, *Biophotonics Instrumentation – How the Nature of Biological Samples Influences Instrumentation Design Solutions*	
5:00 pm – 6:30 pm		**Stoyan Tanev**, *Problem Based Learning Session - I*	**Stoyan Tanev**, *Problem Based Learning Session - II*	**Roundtable discussion:** *Biophotonics – a Smart Solution looking for Problems to be Solved*	

Our lecturers:

Douglas A. Gray, PhD
Professor,
Depts. of Medicine and Biochemistry,
Microbiology and Immunology,
University of Ottawa
Senior Scientist, Ottawa Cancer Centre

Rejean Munger, PhD
Visual Optics Laboratory
Clifford, Gladys and Lorna J. Wood
Chair for Vision Research
Ottawa Eye Institute
Ottawa Health Research Institute

David Cramb, PhD
Assistant Professor,
Department of Chemistry
Adjunct Professor,
Department of Pharmacology and
Therapeutics, University of Alberta

Brian C. Wilson, PhD
Professor of Medical Biophysics,
University of Toronto.
Division Head, Ontario Cancer
Institute-University Health Network

Paras N. Prasad, PhD
Distinguished Professor of Chemistry,
Director of the Institute for Lasers,
Photonics, and Biophotonics
Department of Chemistry,
University at Buffalo, USA

Dominic Bergeron, PhD
Professor, Coordinator,
Biotechnology program
La Cité Collégiale, Ottawa

Stoyan Tanev, PhD
Program Manager – Photonics and
Biophotonics Programs
Vitesse™ Re-Skilling Canada Inc.

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