

International Summer School – Part B, August 23rd-31st, 2013

From 2D biology to engineered 3D medical solutions

University of Nova Gorica, Center for Biomedical Sciences and Engineering

Palace Lanthieri, Vipava, Slovenia

Advanced course for graduate students and postdoctoral fellows



Friday, August 23 rd , 2013	
15:00-18:30 p.m.	Registration and Poster set-up
18:30-19:00 p.m.	Welcome and Introductions
19:00-22:00 p.m.	Reception and Poster Session

Saturday, August 24 th , 2013	
8:00-8:50 a.m.	Challenges in cell-based tissue engineering
8:50-9:40 a.m.	Embryonic and Adult Stem Cells for Cell-Based Therapies – benefits and pitfalls
10:00-10:50 a.m.	Choosing and using primary differentiated cells
10:00-12:00 noon	Biosafety, Regulatory Restrictions, Team Assignments Pre-lab I – Characterization of stem cell phenotype
1:30-6 p.m.	Lab I – Embryonic stem cell basics and in vitro differentiation
7:00 p.m.	Extracellular Matrix: Structure and Function; Applications to Tissue Engineering

Sunday, August 25 th , 2013	
8:00-8:50 a.m.	Cell-derived extracellular matrix for scaffold-less tissue constructs
8:50-9:40 a.m.	Biomaterials in tissue engineering
10:00-10:50 a.m.	Surface Modifications and Design of Molecular Interfaces for Tissue Engineering Applications
10:50-12:00 noon	Pre-lab II - Coated surfaces, cell-derived matrices, identification of ECM matrix components
1:30-6:00 p.m.	Lab II – Derivation and characterization of cell-derived extracellular matrices

Monday, August 26 th , 2013	
8:00-8:50 a.m.	Self-assembling Peptides: From Bio-inspired Materials to Regeneration
8:50-9:40 a.m.	Covalent immobilization of growth factors onto scaffolds for tissue engineering
10:00-10:50 a.m.	Adaptable hydrogel array format for 3-dimensional cell culture
10:50-12:00 noon	Pre-lab III – What is our target application?
1:30-6:00 p.m.	Lab III – Designing application-specific, customized molds

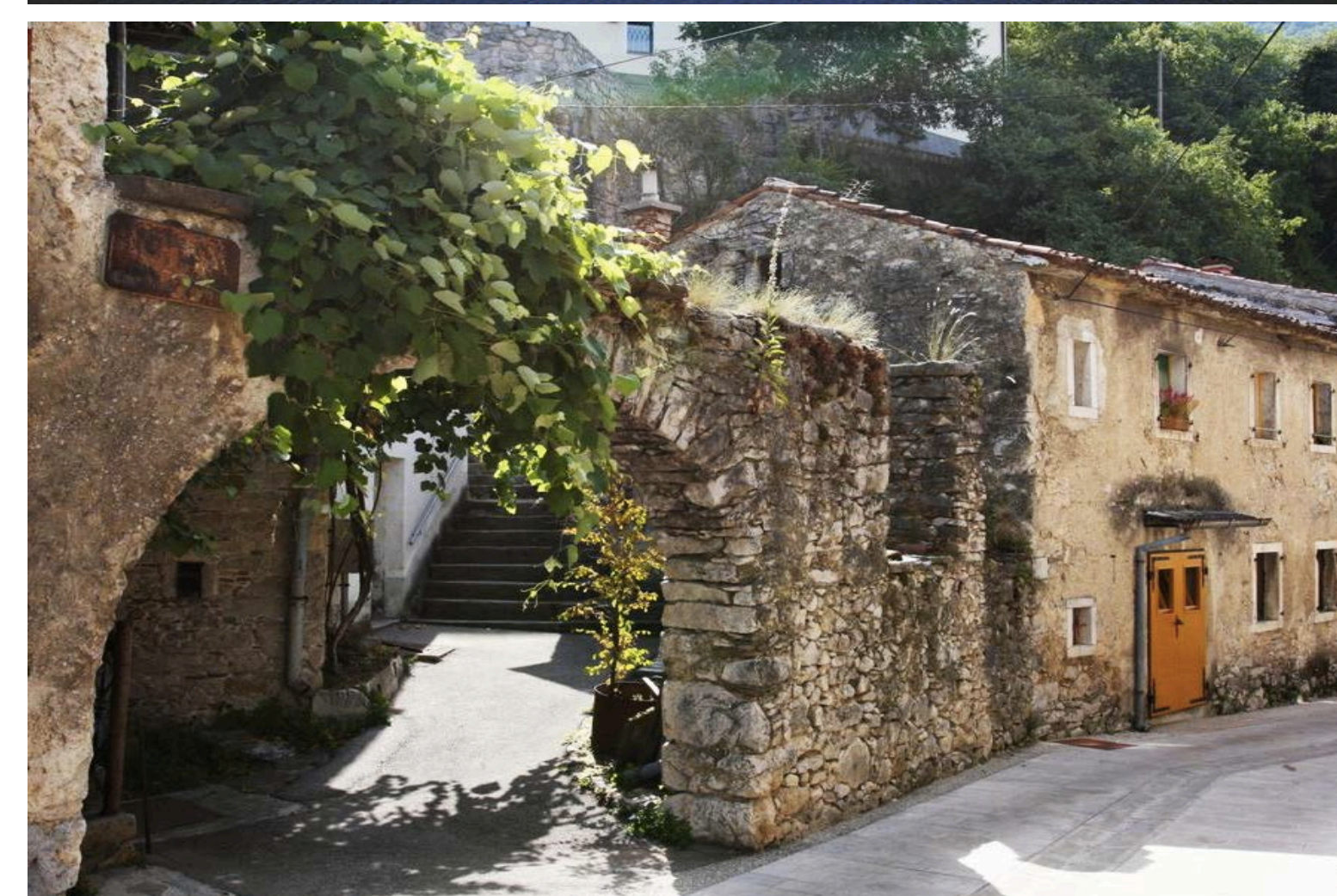
Tuesday, August 27 th , 2013	
8:00-8:50 a.m.	3D cell culture
8:50-9:40 a.m.	Bioreactors for in vitro tissue growth and maintenance
10:00-10:50 a.m.	Tissue Engineering vs. Regeneration
10:50-12 noon	Pre-lab IV – From material to a 3D scaffold
1:30-6:00 p.m.	Lab IV- Extrusion, polymerization, gelling, 3D printing, surface modification
7:00 p.m.	Tissue Engineering and Regenerative Medicine: Approaches to Translation

Wednesday, August 28 th , 2013	
8:00-8:50 a.m.	Tissue engineered vascular constructs
8:50-9:40 a.m.	Tissue engineering for skeletal muscle applications
10:00-10:50 a.m.	Tissue Engineering for cardiac applications
10:50-12 noon	Pre-lab V – Cell-material interactions – what are we looking for?
1:30-6:00 p.m.	Lab V – Populating scaffolds with cells
7:00 p.m.	Genetic engineering, siRNA and cardiovascular interventions

Thursday, August 29 th , 2013	
8:00-8:50 a.m.	Importance of biomechanical forces in developing tissue constructs
8:50-9:40 a.m.	Functional testing of tissue constructs
10:00-10:50 a.m.	Lecture
10:50-12 noon	Pre-lab VI – What properties does our construct need to have?
1:30-6:00 p.m.	Lab VI - Functional testing of 3D tissue constructs
7:00 p.m.	Tissue Engineering and Regenerative Medicine: Approaches to Translation

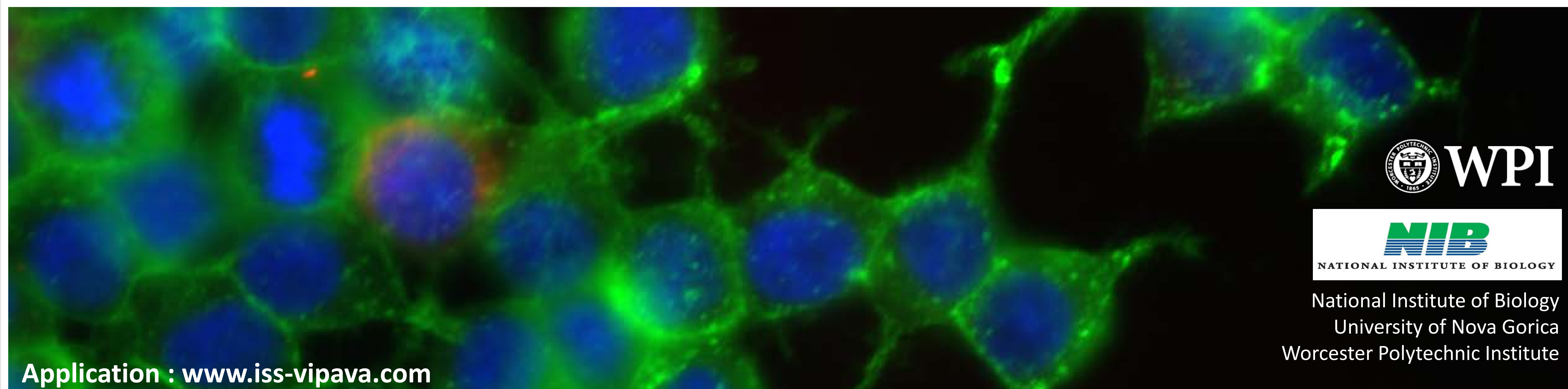
Friday, August 30 th , 2013	
Symposium “Translating discoveries from bench to bedside” NIB, Marine Biology Station, Piran	
10:00-11:40	Where are the critical clinical needs?
11:40-12:30	Properties of a tissue engineered transplant for clinical application
2:00-2:40	Identifying and protecting intellectual property
2:40-3:20	Making it to market

Saturday, August 31 st , 2013	
11:00 – 12:00 noon	Feedback and Conclusion



Instructors

Milica Radišič, University of Toronto, Canada
Katja Schenke-Layland, Eberhard Karls University, Germany
Gerald Schatten, University of Pittsburgh, USA
Marsha Rolle, WPI, USA
Todd McDevitt, Georgia Institute of Technology, USA
Carlos Semino, Universitat Ramon Llull, Spain
Mauro Giacca, ICGEB, Italy
Glenn Gaudette, WPI, USA
Marco Quarta, Stanford University, USA
Tanja Dominko, UNG, Slovenia and WPI, USA
Randolph Ashton, University of Wisconsin-Madison, USA
Helena Motaln, NIB, Slovenia
Ario de Marco, UNG, Slovenia and Institute Curie, France
Darja Marolt, New York Stem Cell Foundation, USA
Elsa Fabbretti, UNG, Slovenia
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Application : www.iss-vipava.com



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