



ISSRPPM

INTERNATIONAL SUMMER
SCHOOL OF RENAL PATHOLOGY
& PRECISION MEDICINE
Bari, Italy, June 10-21, 2024

SCHOOL FRAMEWORK

www.issrppm.org

The CME-accredited International Summer School of Renal Pathology & Precision Medicine (ISSRPPM) will be held at the University of Bari in June 2024 with state-of-the-art facilities. This educational endeavor is dedicated to advancing knowledge of kidney disease and improving management of kidney diseases. The school builds on the previously established International Summer School of Renal Pathology (ISSRP) since 2011 and aims to train the next generation of renal pathologists to practice integrated nephropathology.

The school will be organized into 4 modules:

- Precision Medicine – Basic Concepts from tissue procurement to data extraction and analysis
- Pathology of Native Kidney Diseases with clinico-pathologic and molecular correlation
- Digital Pathology and Image Analysis of Kidney Diseases
- Molecular Nephropathology & Data Integration

Each module will include:

- Formal didactic lectures
 - Renal Pathology
 - Image analysis
 - Omics technologies
- Laboratory experience for small groups
 - Review of cases and small group case study with instructor
 - Image analysis
 - Relevant Omics technologies
- Data integration & phenotyping-endotyping – Case studies

CURRICULUM

RENAL PATHOLOGY OF NATIVE KIDNEY DISEASES

- Podocytopathies
- Mitochondriopathies
- Collagenopathies
- Immune-Complex mediated glomerulonephritis
- Complement mediated glomerulonephritis
- Crescentic glomerulonephritis
- Vascular diseases
- Monoclonal diseases of renal significance & organized deposits
- Diabetic kidney disease
- Chronic kidney disease
- Tubulointerstitial diseases
- Renal storage diseases

COMPUTATIONAL IMAGE ANALYSIS

- Principles of digital pathology
- Histo-tools
- Annotation-segmentation best practices
- Machine Learning classifiers
- Pathomic feature extraction
- Digital biomarkers
- Visualization tools
- Image analysis in clinical practice

MOLECULAR NEPHROPATHOLOGY

- Genetics of kidney diseases
- Technologies and analytical approaches in kidney tissue and biofluids
- Spatial omic analysis
- Multiscale data integration
- Principles in data mining strategies and interfaces
- Specific search engines
- Data integration

CONTACTS



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SCHOOL DIRECTORS

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ISSRPPM – June 10th–June 21st 2024 - Schedule

Week 1: June 10th to June 15th 2024

	Monday 10	Tuesday 11	Wednesday 12	Thursday 13	Friday 14	Saturday 15				
7:30-8:00 am	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast				
8:00-8:30 am							Kidney biopsy - procurement @ bed side - small group	Kidney biopsy - procurement @ bed side - small group	Kidney biopsy - procurement @ bed side - small group	Kidney biopsy - procurement @ bed side - small group
8:30-9:00 am										
9:00-9:30 am	Welcome & orientation	Diagnostic kidney biopsy - pathology protocol	Independent review of cases	Independent review of cases	Independent review of cases	Storage and inherited metabolic diseases				
9:30-10:00 am	Clinical indication & research kidney biopsy	Algorithmic approach to glomerular diseases	Independent review of cases	Annotation and labeling practice	Independent review of cases	Lupus nephritis				
10:00-10:30 am	Standardization of preanalytics/ tissue procurement	Descriptor scoring vs interpretative diagnoses	Histotools	Image analysis / Feature extraction / Classification	Implementation of image analysis in clinical practice		Other autoimmune diseases			
10:30-11:00 am		Podocytopathies			Batch effect	Q/A		Review of cases with instructors	Image analysis lab	Ultrastructural pathology
11:00-11:30 am	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break				
11:30-12:00 am	Kidney structural and molecular anatomy	Obesity-related glomerulopathies	Deep learning Introduction + Concepts (including foundation models)	Hands-on: Using QuPath to build KM curves from IHC images (cell segmentation, feature extraction, + km buildingJ)	IC-MPGN and Post-Peri Infectious disease	Bring your own difficult case				
12:00-12:30 am	Introduction to Omics	Mitochondriopathies			Annotation best practices		Bring your own difficult case			
12:30-1:00 pm		Ontologies	Independent review of cases	Annotation and labeling practice	Annotation and labeling practice	Annotation and labeling practice		Annotation and labeling practice		
1:00-1:30 pm	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch				
1:30-2:00 pm										
2:00-2:30 pm	Tissue procurement/ processing practice - lab	Ontologies practice	Independent review of cases	Classification of Vasculopathies	Diseases of complement dysregulation (TMA - HUS - C3 glomerlpathy and C3 glomerulonephritis)					
2:30-3:00 pm					Motivation for computational pathology	Hands-on feature extraction using ImageJ	Classification of Vasculitis	Thrombotic microangiopathies		
3:00-3:30 pm	Ontologies practice	Tissue procurement/ processing practice - lab	Overview of Statistical methods applied to kidney diseases 1 - basic stat	Crescentic GN	Monoclonal disease of renal significance					
3:30-4:00 pm			Overview of Statistical methods applied to kidney diseases 1 - ML	Membranous nephropathy	Ultrastructural pathology	Organized deposits & special technologies (Amyloidosis - Fibrillary and immunotactoid)				
4:00-4:30 pm	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break				
4:30-5:00 pm	Introduction to digital pathology	ML Introduction + general ML concepts (metrics, KM curves, cross-validation, etc.)	IgA NP and Vasculitis	Review of cases with instructors	Image analysis lab	Independent review of cases				
5:00-5:30 pm	Introduction to Image Analysis	Stat Q/A	Image analysis Q/A				Independent review of cases			
5:30-6:00 pm	Q/A	Presentation of difficult/rare cases	Early dismissal - Social dinner			Presentation of difficult/rare cases				

ISSRPPM – June 10th–June 21st 2024 - Schedule

Week 2: June 17th to June 21st 2024

	Monday 17	Tuesday 18	Wednesday 19	Thursday 20	Friday 21	
7:30-8:00 am			Breakfast			
8:00-8:30 am	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	
8:30-9:00 am			Overview - From Genes to transcripts: Technologies and Analytical approaches in kidney tissue and biofluids			
9:00-9:30 am	Algorithmic approach to tubulointerstitial diseases	Challenges in ML in pathology (secure AI, sustainable AI)	Overview - From Proteins to metabolites to pathway mapping: Technologies and Analytical approaches in kidney tissue and biofluids	1. Nephroseq 2. KPMP tool suite: Explorer, Spatial Viewer 3. Kidney CellxGene KPMP, HCA and beyond 4. Working with consortium data sets: TranSMART and beyond 5. Genetic data bases: From ClinVar to NephQLT	1. Nephroseq 2. KPMP tool suite: Explorer, Spatial Viewer 3. Kidney CellxGene KPMP, HCA and beyond 4. Working with consortium data sets: TranSMART and beyond 5. Genetic data bases: From ClinVar to NephQLT	
9:30-10:00 am	Tubulointerstitial disease - Part 1	Standardization	Overview - Molecules in their kidney home: Opportunities and challenges in spatial molecular analyses			
10:00-10:30 am	Tubulointerstitial diseases - Part 2	Digital Pathology regulation + scalability	Overview - Bringing it all together: Multiscalar data integration for molecular disease definition			
10:30-11:00 am	Cystic diseases of the kidney	Usability - Quality - Safety	Q/A - Discussion			
11:00-11:30 am	Coffee break	Coffee break	Coffee break			
11:30-12:00 am	Review of cases with the instructor	Risk management and Education	Overview - How to find knowledge in data: Introduction and principles in data mining strategies and interfaces for the nephropathologist			
12:00-12:30 am	Bring your own difficult case	Q/A	Overview	1. Nephroseq 2. KPMP tool suite: Explorer, Spatial Viewer 3. Kidney CellxGene KPMP, HCA and beyond 4. Working with consortium data sets: TranSMART and beyond 5. Genetic data bases: From ClinVar to NephQLT	1. Nephroseq 2. KPMP tool suite: Explorer, Spatial Viewer 3. Kidney CellxGene KPMP, HCA and beyond 4. Working with consortium data sets: TranSMART and beyond 5. Genetic data bases: From ClinVar to NephQLT	
12:30-1:00 pm		Independent review of cases	Independent review of cases			How to find knowledge in data: Introduction into specific search engines (Nephroseq, TranSMART, KPMP explorer, spatial viewer, CellxGene, HubMAP explorer)
1:00-1:30 pm	Lunch	Lunch	Lunch			
1:30-2:00 pm				Lunch	Lunch	
2:00-2:30 pm	The aging kidney	Independent review of cases	1. Nephroseq 2. KPMP tool suite: Explorer, Spatial Viewer 3. Kidney CellxGene KPMP, HCA and beyond 4. Working with consortium data sets: TranSMART and beyond 5. Genetic data bases: From ClinVar to NephQLT			
2:30-3:00 pm	CKD in diabetes			Current Consortia - Overview	The KPMP kidney atlas	
3:00-3:30 pm	CKD of unknown etiology	Radiopathomics		Methodologies to visualize image data	Kidney atlas - exercise	Kidney atlas - exercise
3:30-4:00 pm	Ultrastructural pathology	Genetic of kidney diseases: guidelines for testing		Fusion training	Kidney atlas - exercise	Kidney atlas - exercise
4:00-4:30 pm	Coffee break	Coffee break		Coffee break	Next generation nephropathology	
4:30-5:00 pm	Independent review of cases	Overview on clinical trials				
5:00-5:30 pm		Integrated pathology - case presentation (AKI phenotypes/endophenotypes)		Fusion usability study	Summary and Conclusions	
5:30-6:00 pm	Integrated pathology - case presentation (CKD in diabetes phenotypes/endophenotypes)	Integrated pathology - case presentation (IgA phenotypes/endophenotypes)	Early dismissal - Social dinner	Integrated pathology - case presentation (FSGS/MCD phenotypes/endophenotypes)		

LEGEND

INTRODUCTORY MODULE	Lecture	Practice
RENAL PATHOLOGY MODULE	Lecture	Practice
IMAGE ANALYSIS MODULE	Lecture	Practice
OMICS MODULE	Lecture	Practice
DATA INTEGRATION	Case presentation	