



Renal Molecular Pathologist Network - REMAP

The project is divided in two main modules:

- 1. e-course: Nephrology, Histopathology and Omics
- 2. Internship of students of 19 days per each topic for 12 students (2 post-graduates from each University)

Master Course Program

Nephrology = 75 (contact hours, test)

The first module will provide detailed knowledge about acquired and inherited kidney diseases. A number of lectures will be focused on etiopathogenesis, diagnosis, prognosis and management. Each partner will provide its contribution according to the specific background, respectively

- 1. Lectures on history of renal biopsy, procedures, indications and contraindications
- 2. Lectures on membranous GN, idiopathic and secondary
- 3. Lectures on diabetic nephropathy
- 4. Lectures on thrombotic microangiopathies
- 5. Lectures on podocytopathies (in particular FSGS and minimal change disease)
- 6. Lectures on IgA nephropathy
- 7. Lectures on hemodynamic mediated diseases
- 8. Lectures on renal vasculitis, ANCA-associed vasculitis and crescentic glomerulopathy
- 9. Lectures on lupus nephritis
- 10. Lectures on renal diseases associated with monoclonal Ig including light chain tubulopathy, light chain cast nephropathy, LC and HC deposit disease, cryoglobulinemic GN, Immunotactoid GN, Amyloidosis AL
- 11. Lectures on collagenopathies and other inherited disorders (Alport's Disease, Thin basement membrane nephropathy)
- 12. Lectures on Cystic diseases (Polycystic Kidney Disease; Medullary Cystic Diseases)

















- 13. Lectures on Fibrillary GP
- 14. Lectures on Amyloidosis (non AL)
- 15. Lectures on mechanisms and pathology of acute and chronic allograft rejection
- 16. Lectures on post-infectious glomerulonephropathy
- 17. Lectures on Tubulointerstitial diseases
- 18. Lectures on "MPGN" type 1 and secondary
- 19. Lectures on Dense deposit diseases
- 20. Lectures on C3GP
- 21. Discussion of 100 clinical cases

Training Partners:

- 1. University of Bari
- 2. University of Aachen
- 3. Charles University
- 4. University of Cyprus
- 5. University of Amsterdam
- 6. Instituto de Investigación Sanitaria Fundación Jiménez Díaz

Practice and Internship of 19 days in the following Clinic Centres:

- 1. University of Bari
- 2. University of Aachen
- 3. Charles University

Telepathology = 40 (contact hours, test)

The second module will allow providing theory and practical knowledge of telepathology applied to renal diseases.

- 1. Lectures on technical aspects of the renal biopsy (LM, IF. EM)
- 2. Introduction to digital pathology (Philips System)
- 3. Review and discussion of 200 histopathology cases

Training Partners:

















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- 3. Charles University
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Internship of 19 days at the following Clinic Centres:

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OMICS sciences applied to Nephrology = 65 (contact hours, test)

The third module will allow providing state of art knowledge and practical skills on new high-throughput techniques. Trainees will learn: 1) how to manage biological samples in order to perform high-throughput screening; 2) how to setup and interpret gene sequencing analysis, transcriptomics, proteomics and metabolomics analyses. Great emphasis will be given to the setup of new protocols and evaluation of their usefulness in clinical practice.

- 1. Lectures on Transcriptomic screening (microRNAs analysis) and its application to CKD
- 2. Lectures on genome sequencing (Next Generation Sequencing) and its application to CKD
- 3. Lectures on urine proteomics (MALDI and/or LC/MS profiling) applied to acute and chronic kidney diseases
- 4. Lectures on urine Metabolome sequencing (LC/MS analysis) applied to acute and chronic kidney diseases
- 5. Lectures on proteomics applied to rejection
- 6. Lectures on Systems biology approaches to Identify diseaserelevant pathways in CKD

















- 7. Practical exercises on: Transcriptomic screening; genome sequencing; urine metabolomics and proteomics screening; bioinformatics.
- 8. Molecular patterns in the course of renal disease
- 9. Metabolomics and other omics approaches to discover new CKD biomarkers
- 10. Animal and cell models of renal diseases
- 11. Practical exercises on metabolomics
- 12. Lectures on Association studies in primary glomerulopathies.
- 13. Lectures on Modifier genes in CKD
- 14. Lectures on Mutation discovery by multiple molecular techniques and genetics software
- 15. Lectures on Next Generation Sequencing, using the Ion Torrent, PGM instrument
- 16. Lectures on Bioinformatics analysis and data mining
- 17. Lectures on animal models (Col4a3 knock-in mouse) to study Collagen IV glomerulopathy
- 18. Practical exercises on Mutation discovery techniques; Next generation techniques and bioinformatics
- 19. Lectures on transcriptomics approach to discover novel therapeutic targets in kidney disease
- 20. Practical exercitations on trascriptomics

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