



Universidad de Buenos Aires  
Facultad de Ciencias Exactas y Naturales  
Departamento de Química Biológica

Q.B. 2006

٢٦

29

## **DEPARTAMENTO DE QUÍMICA BIOLÓGICA**

## **CURSO DE POSTGRADO O SEMINARIO**

AÑO: 2006

- 1) **NOMBRE DEL CURSO/SEMINARIO:** Diagnóstico Molecular en Medicina. Su Aplicación a Enfermedades Genéticas, Tumorales e Infecciosas.

2) **NOMBRE Y APELLIDO DEL RESPONSABLE:** Dra María Victoria Rossetti, Dra Victoria Estela Parera

3) **DOCENTES QUE COLABORAN EN EL DICTADO DEL CURSO:** Dras Ana María Buzaleh, Susana Afonso y Esther Gerez y la participación de destacados especialistas.

4) **FECHA DE INICIACIÓN:** 20/11                   **FECHA DE FINALIZACION:** 7/12

5) **CANTIDAD DE HORAS TOTALES DE DICTADO:** 90  
a) **TEORICAS:** 35 horas  
b) **LABORATORIO:** 55 horas

6) **FORMA DE EVALUACIÓN:** Examen final escrito

7) **LUGAR DE DICTADO:** Departamento de Química Biológica, FCEN, UBA

8) **PUNTAJE QUE OTORGА PARA EL DOCTORADO:** 3

9) **Nº DE ALUMNOS:** Mínimo: -                   Máximo: 10

10) **ARANCEL PROPUESTO:** 300 módulos: 100 teóricos y 200 prácticos

## **11) PROGRAMA ANALÍTICO Y BIBLIOGRAFÍA DEL CURSO**

## PROGRAMA

- Técnicas básicas en Biología Molecular: PCR, Secuenciación, PCR en tiempo real, PCR inversa, PCR larga distancia, Microarreglos.
  - Expresión de proteínas. Mutagénesis. Minigenes.
  - Bases moleculares de diversas patologías: cáncer, fibrosis quística, retinoblastoma, porfirias, hemocromatosis, talasemia, distrofia muscular de Duchenne, hemofilia.



Universidad de Buenos Aires  
Facultad de Ciencias Exactas y Naturales  
Departamento de Química Biológica

- Clínica, bioquímica, diagnóstico molecular de HIV y virus de hepatitis. Sida: situación actual.
- Isoenzimas del citocromo P450. Polimorfismos y su implicancia clínica

#### BIBLIOGRAFIA

- The human hepatic cytochromes P450 involved in drug metabolism.  
Wrighton, S.A. & Stevens, J.C.  
Critical Rev. Toxicol. 1992; **22**, 1-21
- The porphyrias  
Kappas A, Sassa S, Gallbraith RA, Nordmann Y. 1995. In: Scriver CR, Beaudet AL, Sly WS, Valle D, eds. *The Metabolic Basis of inherited Disease*. McGraw-Hill, New York, pp 2103-2159.
- Modulation of the phenotype in dominant erythropoietic protoporphyrina by a low expression of the normal ferrochelatase allele.  
Gouya L, Deybach J.C, Lamoril J, Da Silva V, Beaumont C, Grandchamp B, Nordmann Y.  
Am J Hum Genet 1996, **58**: 292-299.
- A novel MHC class Ielike gene is mutated in patients with Hereditary Hemochromatosis.  
Feder J, Gnarke A, Thomas W, Isuchihashi Z, Ruddy DA, Basava A, et al.  
Nature Genet 1996; **13**: 399-408.
- Genetic hemochromatosis in Italian patients with porphyria cutanea tarda: possible explanation for iron overload.  
Fargion S, Francazani AL, Romano R, Cappellini MD, Fare M, Mattioli M, et al.  
J Hepatol 1996; **24**: 569-4.
- P450 superfamily: Update on new sequences, gene mapping, accession numbers and nomenclature.  
Nelson, D.R.; Koymans, L.; Kamtaki, T.; Stegeman, J.J.; Feyereisen, R.; Waxman, D.J.; Waterman, M.R.; Gotoh, O.; Coon, M.J.; Estabrook, R.W.; Gunsalus, I.C. & Nebert, D.W.  
Pharmacogenetics 1996; **6**: 1-42
- A Batlle (1997). Porfirias y Porfirinas. Aspectos clínicos, bioquímicos y biología molecular. Acta Bioquímica Clínica Latinoamericana, Supl. 3.
- The C282Y mutation in the haemochromatosis gene (HFE) and hepatitis C virus infection are independent cofactors for porphyria cutanea tarda in Australian patients.  
K, Busfield F, Jazwinska E, Gibson P, Butterworth L, Cooksley W, et al.  
J Hepatol 1998; **28**: 404-9.
- High prevalence of the H63D HFE mutation in Italian patients with Porphyria Cutanea Tarda.  
Sampietro M, Piperno A, Lupica L, Arosio C, Vergani A, Corbetta N, et al.  
Hepatology 1998; **27**: 181-4.



Universidad de Buenos Aires  
Facultad de Ciencias Exactas y Naturales  
Departamento de Química Biológica

31

- Familial Porphyria Cutanea Tarda: Characterization of seven novel Uroporphyrinogen Decarboxylase gene mutations and Frequency of Common Hemochromatosis Alleles  
Manuel Méndez; Lonnie Sorkin; María Victoria Rossetti; Kenneth H. Astrin; Alcira M.del Carmen Batlle; Victoria E. Parera; Gerardo Aizencang & Robert J. Desnick.  
*American J Human Genetics* 1998; **3**: 1365-1375
- Iron overload in porphyria cutanea tarda.  
Sampietro M, Fiorelli G, Fargion S  
*Haematologica* 1999; **84**: 248-53.
- The physiological and pharmacological roles of cytochrome P450 isoenzymes.  
Chang, G.W.M. & Kam, P.C.A.  
*Anaesthesia* 1999; **54**: 42-50
- Cytochrome P450 enzyme system: genetic polymorphisms and impact on clinical pharmacology  
van der Weide, J. & Steijns, L.S.W.  
*Ann. Clin. Biochem.* 1999; **36**: 722-729
- Identification and characterization of Hydroxymethylbilane Synthase mutations causing Acute Intermittent Porphyria: Evidence for an ancestral founder of the common G111R mutation  
De Siervi A.; M.V. Rossetti; V.E. Parera; K.H. Astrin; G.I. Aizencang; I.A. Glass; R.J.; A.M. del C. Batlle & R.J. Desnick.  
*Am. J Med. Genet.* 1999; **86**: 366-375 .
- Variegate Porphyria in Western Europe: identification of PPOX gene mutations in 104 families, extent of allelic heterogeneity, and absence of correlation between phenotype and type of mutation  
Whatley SD, Puy H, Morgan, RR, Robreau AM, Roberts AG, Nordman Y, Elder GH, Deybach, JC.  
*Am J Hum Genet* 1999, **65**: 984-994.
- HFE mutations analysis in 711 Hemochromatosis probands: Evidence for S65C implication in mild form of Hemochromatosis.  
Mura C, Raguenes O, Ferec C.  
*Blood* 1999; **93**: 2502-5.
- Inheritance in Erythropoietic Protoporphyria: A common wild-type ferrochelatase allelic variant with low expression accounts for clinical manifestation.  
Gouya L, Puy H, Lamoril J, Da Silva V, Grandchamp B, Nordmann Y, Deybach JC.  
*Blood* 1999; **93**: 2105-2110.
- Homozygous Variegate Porphyria in South Africa: Genotypic Analysis in two cases  
Corrigan AV, Hift RJ, Davids LM, Hancock V, Meissner D, Kirsch RE, Meissner PN  
*Molecular Genetics and Metabolism* 2000; **69**: 323-330
- Two new mutations (H106P and L178V) in the protoporphyrinogen oxidase gene in Argentinean patients with variegate porphyria.



32

Universidad de Buenos Aires  
Facultad de Ciencias Exactas y Naturales  
Departamento de Química Biológica

De Siervi A., Parera VE, Batlle A, Rossetti MV  
Hum Mut 2000; **16**: 532-534.

- A novel mutation (1320InsT) identified in two Argentine families with Variegate Porphyria.  
De Siervi A, Parera VE, Varela LS, Batlle A, Rossetti MV  
Hum Mut 2000; **16**: 96-98.

- Hemochromatosis genes and other factors contributing to the pathogenesis of porphyria cutanea tarda.

Bulaj Z, Phillips J, Ajioka R, Franklin M, Griffen LM, Guinee D, et al.  
Blood 2000; **95**:1565-71.

- Co-inheritance of mutations in the uroporphyrinogen decarboxylase and hemochromatosis genes accelerates the onset of porphyria cutanea tarda.

Brady J, Jackson H, Roberts A, Morgan R, Whatley S, Rowlands G, et al  
J Invest Dermatol 2000; **115**: 868-74.

- Homozygous variegate porphyria: a compound heterozygote with novel mutations in the protoporphyrinogen oxidase gene

Palmer RA, Elder GH, Barrett DF, Keohane SC  
Br. J. Dermatol. 2001; **144**: 866-869

- Hereditary hemochromatosis.

Hash RB.

J Am Board Fam Pract 2001; **14**: 266-73.

- C282Y and H63D mutation of the hemochromatosis gene in German porphyria cutanea tarda patients.

Tannapfel A, Stolzel U, Kostler E, Melz S, Richter M, Keim V, et al.  
Virchows Arch 2001; **439**:1-5.

- Homozygous variegate Porphyria: 20 y follow-up and characterization of molecular defect.

Kauppinen R, Timonen K, von und zu Fraunberg M, Laitinene E, Ahola H, Tenhunen R, Taketani S, Mustajoki P:

J Invest Dermatol 2001, **116**: 610-613.

- Homozygous variegate Porphyria: 20 y follow-up and characterization of molecular defect.

Kauppinen R, Timonen K, von und zu Fraunberg M, Laitinene E, Ahola H, Tenhunen R, Taketani S, Mustajoki P.

J Invest Dermatol. 2001; **116**: 610-613.

- Identification of a founder mutation in the protoporphyrinogen oxidase gene in variegate Porphyria patients from Chile.

Frank J, Aita VM, Ahmad W, Lam H, Wolff C, Christiano AM  
Hum Hered 2001, **51**: 160-168.



Universidad de Buenos Aires  
Facultad de Ciencias Exactas y Naturales  
Departamento de Química Biológica

- Hepatitis C virus and GBV-C/hepatitis G virus in Argentine patients with porphyria cutanea tarda.  
Oubina JR, Quarferi JF, Sawicki MA, Mathet VL, Ruiz V, Schroder T, et al.  
*Intervirology* 2001; **44**: 215-8.
- Human hereditary hepatic porphyrias (review)  
Y Nordman, H. Puy  
*Clinica Chimica Acta* 2002; **325**: 17-37
- Porphyria cutanea tarda: The etiological importance of mutations in the HFE gene and viral infections is population-dependent  
Hift RJ, Corrigan AV, Hancock V, Kannemeyer J, Kirsch RE, Meissner PM.  
*Cell Mol Biol* 2002; **48**: 853-9.
- Precipitating aggravating factors of porphyria cuatnea tarda in spanish patients  
Cruz-Rojo J, Fontanellas A, Moran-Jimenez MJ, Navarro- Ordóñez S, García-Bravo M, Méndez M, et al.  
*Cell Mol Biol* 2002; **48**: 845-52.
- Molecular genetics of CYP2D6. Clinical relevance with focus on psychotropic drugs.  
Bertilsson, L.; Dahl, M.L.; Dalén, P. & Al-Shurbaji, A.  
*Br. J. Clin. Pharmacol.* 2002; **53**, 111-122.
- The penetrance of dominant erythropoietic protoporphyrria is modulated by expression of wildtype FECH.  
Gouya L, Puy H, Robreau AM, Bourgeois M, Lamoril J, Da Silva V, Grandchamp B, Deybach JC.  
*Nature Genetics* 2002 **30**: 27-28.
- Hemochromatosis (HFE) and transferrin receptor-1 (TFRC1) genes in sporadic porphyria cuatnea tarda (sPCT).  
Lamoril J, Andant C, Gouya L, Malonova E, Grandchamp B, Martasek P, Deybach JC, Puy H. *Cell Mol Biol*. 2002; **48**: 33-41
- A genotype-phenotype correlation between null-allele mutations in the Ferrochelatase gene and liver complication in patients with erythropoietic protoporphyrria.  
Minder EI, Gouya L, Schneider-Yin, Deybach JC.  
*Cellular and Molecular Biology* 2002; **48**: 91-96.
- Hematologically Important Mutations; Acute Intermittent Porphyria  
MD Cappellini, F Di Momtemuros, E Di Pierro, G Fiorelli  
*Blood Cells, Molecules and Diseases* 2002; **28**: 5-12
- Molecular and Biochemical Studies of Acute Intermittent Porphyria in 196 Patients and Their Families  
R Kauppinen, M von und zu Fraunberg  
*Clinical Chemistry* 2002; **48**: 1891-1900
- Functional studies of mutations in the human protoporphyrinogen oxidase gene in variegate porphyria  
R Morgan, Da Silva V, Puy H, Deybach JC, Elder GH



Universidad de Buenos Aires  
Facultad de Ciencias Exactas y Naturales  
Departamento de Química Biológica

Cell Mol Biol 2002; **48**: 79-82

- The penetrance of dominant erythropoietic protoporphyria is modulated by expression of wildtype FECH  
Gouya L, Puy H, Burgeois M, Lamoril J, Da Silva V, Grandchamp B, Deybach JC  
Nat Genet. 2002; **30**: 27-28

- Ferrochelatase gene mutations in erythropoietic protoporphyria: focus in liver disease  
Hen FP, Risheg H, Liu Y, Bloomer J  
Cell Mol Biol 2002; **48**: 83-89

- A genotype-phenotype correlation between null-allele mutations in the ferrochelatase gene and liver complications in patients with erythropoietic protoporphyria.  
Minder EI, Gouya L, Scheinder-Yin X, Deybach JC  
Cell Mol Biol 2002; **48**: 91-96

- Clinical and biochemical characteristics and genotype-phenotype correlation in Finnish variegate porphyria patients.  
von und zu Fraunberg M, Timonen K, Mustajoki P, Kauppinen R  
Eur J. Hum Genet 2002, **10**: 649-657.

- Diagnosis and management of the erythropoietic porphyrias.  
Murphy GM  
Dermatol Ther. 2003; **16**: 57-64

- Novel mutations and phenotypic effect of the splice site modulator IVS3-48C in nine Swedish families with erythropoietic protoporphyria.  
Wiman A, Floderus Y, Harper P  
J Hum Genet 2003; **48**: 70-76.

- Nine novel mutations in the protoporphyrinogen oxidase in Swedish families with variegate porphyria.  
Wilman A, Harper P, Floderus Y  
Clin. Genet. 2003, **64**: 122-130.

- Genotypic determinants of phenotype in North American patients with erythropoietic protoporphyria  
H Risheg, FP Chen, JR Bloomer  
Molecular Genetics and Metabolism 2003; **80**: 196-206

- Familial and sporadic porphyria cutanea tarda: clinical, biochemical and genetic features with emphasis on iron status.  
Bygum A, Christiansen L, Petersen NE, Horder M, Thomsen K, Brandrup F  
Acta Derm Venereol 2003; **83**: 115-120

- Acute porphyrias in Argentinean population: a review.  
Parera VE, De Siervi, A, Varela LS, Rossetti MV, Batlle A  
Cell Mol Biol 2003; **49**: 493-500



35

Universidad de Buenos Aires  
Facultad de Ciencias Exactas y Naturales  
Departamento de Química Biológica

- Pharmacogenetics of cytochrome P4502D6: genetic background and clinical implication.  
I Cascorbi.  
Eur J Clin Inv. 2003; **33**: 17-22
- Uroporphyrin accumulation in hepatoma cells expressing human or mouse CYP1A2: relation to the role of CYP1A2 in human porphyria cutanea tarda.  
R. Nichols, S. Cooper, H. Task, N. Gorman, T. Dalton, D. Nebert, J. Sinclair & P. Sinclair.  
Biochem. Pharmacol. 2003; **65**: 545-550
- Molecular Diagnostics of acute intermittent porphyria  
R Kauppinen  
Expert Rev Mol Diagn 2004; **4**: 243-249
- Hereditary Hemochromatosis. A new look at an old disease.  
A. Pietrangelo.  
New. Engl. J. Med. 2004; **350**: 2383-2397
- Modulation of penetrance by wild-type allele in dominantly inherited erythropoietic protoporphyrina and acute hepatic porphyrias  
Gouya L, Puy H, Robreau AM, Lyouri S, Lamoril J, Da Silva V, Grandchamp B, Deybach JC  
Hum Genet 2004; **114**: 256-262
- Acute intermittent porphyria: studies of the severe homozygous dominant disease provides insights into the neurologic attacks in acute porphyrias.  
Solis C, Martinez-Bermejo A, Naidich TP, Kaufmann WE, Astrin KH, Bishop DF, Desnick RJ.  
Arch Neurol. 2004; **61**: 1764-70.
- Autosomal recessive erythropoietic protoporphyrina in the United Kingdom: prevalence and relationship to liver disease.  
Whatley SD, Mason NG, Khan M, Zamiri M, Badminton MN, Missaoui WN, Dailey TA, Dailey HA,  
Douglas WS, Wainwright NJ, Elder GH  
J Med Genet 2004; **41**: e105.
- Modulation of penetrance by the wild - type allele in dominantly inherited erythropoietic protoporphyrina and acute hepatic porphyrias.  
Gouya L, Puy H, Robreau AM, Lyouri S, Lamoril J, Da Silva V, Grandchamp B, Deybach JC.  
Hum Genet 2004; **114**: 256-262
- Modulation of penetrance by the wild-type allele in dominantly inherited erythropoietic protoporphyrina and acute hepatic porphyrias.  
Gouya L, Puy H, Robreau AM, Lyouri S, Lamoril J, Da Silva V, Grandchamp B, Deybach JC.  
Hum Genet 2004; **114**: 256-262.
- Association of porphyria cutanea tarda with hereditary hemochromatosis.  
K. Mehrany, L. Drage, D. Brandhagen & M. Pittelkow.



36

Universidad de Buenos Aires  
Facultad de Ciencias Exactas y Naturales  
Departamento de Química Biológica

J.Am.Acad Dermatol 2004; **51**: 205-211.

- Autosomal recessive erythropoietic protoporphyrria in the United Kingdom: prevalence and relationship to liver disease.

Whatley SD, Mason NG, Khan M, Zamiri M, Badminton MN, Missaoui WN, Dailey TA, Dailey HA, Douglas WS, Wainwright NJ, Elder GH.

J Med Genet 2005; **41**: e105.

- The role of inherited and acquired factors in the development of porphyria cutanea tarda in the Argentinean population.

Méndez M, Rossetti MV, Batlle A, Parera VE.

J Am Acad Dermatol 2005; **52**: 417-424.

- Genetic hemochromatosis update.

P. Brissot, C. Le Lan, R. Lorho, F. Garboriau, G. Lescoat & O. Loreal.  
Acta gastroenterol. Belg. 2005; **68**: 33-37

- Iron Metabolism and toxicity.G. Papanikolau & K. Pantopoulos.  
Toxicology and Applied Pharmacology. 2005; **199**: 2111

- Molecular mechanisms of dominant expression in porphyria.  
Badminton A, Elder GH

J. Inherit. Metab. Dis. 2005; **28**: 277-286

- Genetic polymorphisms of cytochrome P4502D6 (CYP2D6): clinical consequences, evolutionary aspects and functional diversity.

M.Ingelman-Sundberg.

Pharmacogenomics J 2005; **5**: 6-13

-Actualización a cargo de los docentes del curso y especialistas invitados.

Dra. NELIDA A. CANDURRA  
DIRECTORA ADJUNTA  
Dpto. QUÍMICA BIOLÓGICA  
F.C.E. y N. -UBA

VºBº Del Departamento

.....  
VºBº de la Subcomisión de Doctorado

liv.-

  
Ortiz Rossetti  
.....  
Firma del Responsable  
Victoria PARERA