



Sotiria Boukouvala

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Dr. Sotiria Boukouvala is an Assistant Professor in Molecular Genetics at the Department of Molecular Biology and Genetics of Democritus University of Thrace, Greece, where she has been a faculty member since 2006 and also taught as a visitor between 2003 and 2005. In the past, her academic modules have included *Human Genetics*, *Applied Biotechnology*, *Molecular Biology* and *Cell Biology*. She is currently teaching two core modules, *Applications of Molecular Biology in Health Sciences* and *Genomics*. She is also coordinator of the elective module *Introduction to Bioscience Enterprise*, funded by an institutional educational programme on Innovation & Entrepreneurship. Her postgraduate lectures at Democritus University have covered topics such as pharmacogenomics, comparative genomics, molecular diagnostics and biotechnological entrepreneurship. She is currently departmental coordinator of the European mobility programmes *Erasmus*, *Erasmus Placement* and *Leonardo Da Vinci*. Her main research interest is in pharmacogenomics and toxicogenomics, applying comparative genomic approaches to investigate the distribution and function of xenobiotic metabolizing enzymes in a range of organisms.

Before her appointment at the Democritus University of Thrace in 2006, Dr. Boukouvala was a research scientist with the genomics group at Exelixis Inc. in South San Francisco, CA, USA, where she investigated candidate pharmaceutical targets and applied pharmacogenomic methods to predict secondary resistance to anti-cancer therapies. She has also worked in the R&D department of the Greek biotechnology company Medicon Hellas, where she developed innovative systems for genetic diagnosis.

Dr. Boukouvala carried out her *D.Phil.* at the University of Oxford, UK, where she worked with Professor Edith Sim at the Department of Pharmacology as a graduate and post-doctoral research scientist between 1998 and 2002. She also holds an *M.Sc.* with Distinction (1997) from Imperial College London, UK, and a *B.Sc.* in Biology (1996) from the University of Athens, Greece. She has been a Scholar of the Hellenic Scholarship Foundation, the Bodossaki Foundation and Imperial College London. She received a Fondation Santé Fellowship in 2006, and in 2008 she was awarded the National UNESCO-L'Oréal Prize for Women in Science. In 2012, she was the first Greek scientist to be awarded a joint US-EU Fulbright-Schuman Research Scholarship to work as an academic visitor in the USA.

Her research has been funded by national and international grants (including various bilateral grants), and is also supported by nonprofit organizations and the industry. She maintains an international network of scientific collaborations, on pharmacogenomics with the University of Oxford, Kingston University London (UK) and Koç University (Turkey), bacterial toxicogenomics of relevance to environmental bioremediation with the University of Budapest (Hungary), comparative genomics of xenobiotic metabolizing enzymes with the Universities of Paris and Toulouse (France) and agricultural toxicogenomics with the US Department of Agriculture (GA, USA). She is currently Chair of the [International Arylamine N-acetyltransferase Gene Nomenclature Committee](#) and has been invited to give seminars at academic institutions in the US and Europe. She has co-organised 7 scientific conferences and colloquia, and has served as reviewer for >25 scientific journals.

SCIENTIFIC PUBLICATIONS

Academic dissertations

- D.Phil.* Thesis: “Expression of the genes for arylamine *N*-acetyltransferases in mice” (University of Oxford, 2002).
- M.Sc.* Thesis: “Analysis of the critical region for the mouse neural tube defect mutant *looptail* by representational difference analysis” (Imperial College, University of London, 1997).
- B.Sc.* Thesis: “Detection of structural mutations in the alpha-globin chain by direct sequencing of the alpha 2 (*HBBA2*) globin gene” (University of Athens, 1996).

Publications in peer-reviewed journals

- McDonagh, E.M.; Boukouvala, S.; Aklillu, E.; Hein, D.W.; Altman, R.B.; Klein, T.E. (2014). PharmGKB Very Important Pharmacogene (VIP) Summary for *N*-acetyltransferase 2. *Pharmacogenetics & Genomics* (Accepted).
- Tsirka, T.; Boukouvala, S.; Agianian, B.; Fakis, G. (2014). Polymorphism p.Val231Ile alters substrate selectivity of drug-metabolizing arylamine *N*-acetyltransferase 2 (NAT2) isoenzyme of rhesus macaque and human. *Gene* (In press).
- Sabbagh, A.; Marin, J.; Veyssi re, C.; Lecompte, E.; Boukouvala, S.; Poloni, E.S.; Darlu, P.; Crouau-Roy, B. (2013). Rapid birth-and-death evolution of the xenobiotic metabolizing *NAT* gene family in vertebrates with evidence of adaptive selection. *BMC Evolutionary Biology*, 13:62, doi: 10.1186/1471-2148-13-62
- Sim, E.; Fakis, G.; Laurieri, N.; Boukouvala, S. (2012). Arylamine *N*-acetyltransferases – from drug metabolism and pharmacogenetics to identification of novel targets for pharmacological intervention. *Advances in Pharmacology*, 63:169-205.
- Glenn, A.E.; Karagianni, E.P.; Ulndreaj, A.; Boukouvala, S. (2010). Comparative genomic and phylogenetic investigation of the xenobiotic metabolizing arylamine *N*-acetyltransferase enzyme family. *FEBS Letters*, 584:3158-64.
- Wakefield, L.; Boukouvala, S.; Sim, E. (2010). Characterisation of CpG methylation in the upstream control region of mouse *Nat2*: evidence for a gene-environment interaction in a polymorphic gene implicated in folate metabolism. *Gene*, 452:16-21.
- Vagena, E.; Fakis, G.; Boukouvala, S. (2008). Arylamine *N*-acetyltransferase in prokaryotic and eukaryotic genomes: A survey of public databases. *Current Drug Metabolism* 9:628-660.
- Sim, E.; Walters, K.; Boukouvala, S. (2008). Arylamine *N*-acetyltransferases: from structure to function. *Drug Metabolism Reviews* 40:479-510.
- Boukouvala, S.; Westwood, I.M.; Butcher, N.J.; Fakis, G. (2008). Current trends in *N*-acetyltransferase research arising from the 2007 International NAT Workshop. *Pharmacogenomics* 9:765-771.
- Hein, D.W.; Boukouvala, S.; Grant, D.M.; Minchin, R.F.; Sim, E. (2008). Changes in consensus arylamine *N*-acetyltransferase gene nomenclature *Pharmacogenetics & Genomics* 18:367-368.
- Trowe, T.; Boukouvala, S.; Calkins, K.; Cutler, R.E. Jr.; Fong, R.; Funke, R.; Gendreau, S.B.; Kim, Y.D.; Miller, N.; Woolfrey, J.R.; Vysotskaia, V.; Yang, J.P.; Gerritsen, M.E.; Matthews, D.J.; Lamb, P.; Heuer, T.S. (2008). EXEL-7647 inhibits mutant forms of ErbB2 associated with lapatinib resistance and neoplastic transformation. *Clinical Cancer Research* 14:2465-2475.
- Fakis, G.; Boukouvala, S.; Kawamura, A.; Kennedy, S. (2007). Description of a novel polymorphic gene encoding for arylamine *N*-acetyltransferase in the rhesus macaque (*Macaca mulatta*), a model animal for endometriosis. *Pharmacogenetics & Genomics*, 17:181-188.
- Glynou, K.; Kastanis, P.; Boukouvala, S.; Tsaoussis, V.; Ioannou, P.; Christopoulos, T.; Traeger-Synodinos, J.; Kanavakis, E. (2007). High-throughput microtiter well-based chemiluminometric genotyping of 15 β -globin gene mutations in a dry-reagent format. *Clinical Chemistry*, 53:384-391.

- Boukouvala, S.; Fakis, G. (2005). Arylamine *N*-acetyltransferases: What we learn from genes and genomes. *Drug Metabolism Reviews* 37:525-578.
- Boukouvala, S.; Sim, E. (2005). Structural analysis of the genes for human arylamine *N*-acetyltransferases and characterisation of alternative transcripts. *Basic & Clinical Pharmacology & Toxicology* 96:343-351.
- Boukouvala, S.; Price, N.; Plant, K.; Sim, E. (2003). Structure and transcriptional regulation of the *Nat2* gene encoding for the drug-metabolising enzyme arylamine *N*-acetyltransferase type 2 in mice. *Biochemical Journal* 375:593-602.
- Cornish, V.A.; Pinter, K.; Boukouvala, S.; Johnson, N.; Labrousse, C.; Payton, M.; Priddle, H.; Smith, A.J.H.; Sim, E. (2003). Generation and analysis of mice with a targeted disruption of the arylamine *N*-acetyltransferase type 2 gene. *Pharmacogenomics Journal* 3:169-177.
- Boukouvala, S.; Price, N.; Sim E. (2002). Identification and functional characterisation of novel polymorphisms associated with the genes for arylamine *N*-acetyltransferases in mice. *Pharmacogenetics* (now *Pharmacogenetics & Genomics*) 12: 385-394.
- Butcher, N.; Boukouvala, S.; Sim, E.; Minchin R. (2002). Pharmacogenetics of the arylamine *N*-acetyltransferases. *Pharmacogenomics Journal* 2:30-42.
- Fakis, G.; Boukouvala, S.; Buckle, V.; Payton, M.; Denning, C.; Sim, E. (2000). Chromosome mapping of the genes for murine arylamine *N*-acetyltransferases (NATs), enzymes involved in the metabolism of carcinogens: identification of a novel upstream non-coding exon for murine *Nat2*. *Cytogenetics & Cell Genetics* (now *Cytogenetic and Genome Research*) 90:134-138.
- Smelt, V.A.; Upton, A.; Adjaye, J.; Payton, M.A.; Boukouvala, S.; Johnson, N.; Mardon, H.J.; Sim, E. (2000). Expression of arylamine *N*-acetyltransferases in pre-term placentas and in human pre-implantation embryos. *Human Molecular Genetics* 9:1101-1107.

Other publications

- Co-Editor (with Dr. G. Patrinos) of the Greek edition of the specialized textbook *Pharmacogenomics & Proteomics* (S.H. Wong, ed.) for Parisianos Publications (2010).
- Co-Editor of two chapters for the Greek edition of *GENES VIII* (by B. Lewin) for Academic Publications (2005).
- Fulbright Xchange Q&A column, *Business Partners* (the magazine of the American-Hellenic Chamber of Commerce), Vol. XI, no. 63 (Nov.-Dec. 2012), p.44.
- Boukouvala, S.; Patrinos, G. (2010). Applications of Pharmacogenomics in Clinical Practice and Drug Development. *Pharmaceutical Chronicles* (the official journal of the Hellenic Association of Pharmacists), 31:10-16 (in Greek).
- Boukouvala, S. (2007). 4th International Workshop on the Arylamine *N*-acetyltransferases (September 14-16, 2007, Alexandroupolis, Greece). Workshop report for *ISSX Newsletter*, 27:25-26.
- Boukouvala, S. (2003). Molecular Strips by Medicon Hellas: A Greek innovative method for rapid and specific detection of PCR products. Article for the Greek science magazine *BIO*, 5:44-47 (in Greek).
- Various electronic submissions to public scientific databases, including the EMBL/GenBank/DDBJ, Mouse Genome Database, EMBL Third-Party Annotation Database and NAT Nomenclature Database.
- Co-inventor on patent submitted by Medicon Hellas SA (WO/2007/034423, 29-03-2007): "Method for detecting single nucleotide variations in a nucleotide sequence using dry/lyophilized reagents".