Igor Landais, Ph.D.

Post-Doctoral Fellow

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Dept. of Biochemistry and Molecular Biology

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Education

1991-1995: Bachelor of Natural Sciences, Toulouse University, France.
1996: Agregation of Natural Sciences.
1998: Master (Parasitology), INRA/Montpellier University, France.
1999-2002: Ph.D. (Parasitology), INRA/Montpellier University, France.

Professional experiences

1997: Biology teacher, Lycee Pierre de Fermat, Toulouse, France.
1999-2002: Graduate Student, Montpellier University/INRA, France (M. Cerutti lab).
2003-2006: Post-Doc, Biochemistry and Molecular Biology, OHSU (H. Lu lab).
2006-present: Post-Doc, Biochemistry and Molecular Biology, OHSU (M.E. Hoatlin lab).

Research training

1998, DEA (M.Sc. equivalent) in Parasitology: *Characterization of a highly conserved satellite DNA from the parasitoid wasp Trichogramma brassicae.*
Laboratory: *Dr F. Vanlerberghe, Laboratoire de Biologie des Invertebres, INRA, Antibes, France.*

Project: Development of a molecular method for the unambiguous identification of *Trichogramma brassicae*, a minute parasitoid wasp used as a biological control agent against the major corn pest *Ostrinia nubilalis*.

- Identified a highly repeated satellite DNA from this species.
- Generated and tested molecular identification tools against this satellite DNA (DNA probe and oligos).
- Demonstrated suitability of the system for identification purpose (good specificity and sensitivity by squash blot and PCR).
- Published one peer-reviewed article.

1999-2002, Ph.D. Thesis: *Transcriptional study of the early steps of the AcMNPV baculovirus infection and analysis of a cDNA library belonging to its host-cell, Sf9.*
Laboratory: *Dr M. Cerutti, Laboratoire de Pathologie Comparee, INRA-CNRS-Universite Montpellier II, UMR 5087, 30380 St Christol les Ales, France.*

Project 1: Investigation of the transcriptional events occurring during the early steps of insect cell infection by the baculovirus *Ac*MNPV.
Summary: identified consensus binding sites for transcription factors of the b-Zip family in enhancer regions of baculovirus genomes. Investigated their functional importance for early viral transcription.

Project 2: Genomic analysis of Spodoptera frugiperda, AcMNPV baculovirus' host and major crop pest.
Summary: Initiated genomic analysis of S. frugiperda by generating and analyzing EST libraries in an international collaborative environment. Annotated and characterized 3 classes of genes: hsp90, defensins, ribosomal proteins.

- Deposited 83 new S. frugiperda genes in GenBank.
- Contributed to Spodobase (http://bioweb.ensam.inra.fr/spodobase), an international S. frugiperda EST database containing >20,000 ESTs.
- Ph.D. work led to the publication of 5 peer-reviewed articles.
- Presented results at 2 international conferences.
- Awarded a travel award to the 2001 ASV Annual Meeting.
- Awarded a 3-year competitive research fellowship from the French government.

2003-2006, Postdoctoral Fellow: *Regulation of the stability of the transcription elongation factor FACT.*
Laboratory: *Dr. H. Lu, Dept. of Biochemistry and Molecular Biology, Oregon Health and Sciences University, Portland, Oregon.*

Project: Analysis of the regulation and activity of the chromatin remodeling complex FACT.
Summary: Elucidated the 2-steps inactivation of the FACT subunit SSRP1 during apoptosis. Showed that SSRP1 has Spt16-dependent and independent roles in gene transcription.

- Developed and fully characterized 13 high-quality monoclonal antibodies against human SSRP1.
- Launched a study on the presence of SSRP1 apoptotic fragments in the serum of patients with Systemic Lupus Erythematosus.
- Published 2 peer-reviewed articles.

2006-present, Postdoctoral Fellow: *Development of a cell-free assay for screening of compounds that modulate the Fanconi anemia/BRCA DNA repair pathway.*
Laboratory: *Dr. M.E. Hoatlin, Dept. of Biochemistry and Molecular Biology, Oregon Health and Sciences University, Portland, Oregon.*

Project 1: In charge of the development of a novel in vitro, Xenopus egg extracts-based assay for rapid and sensitive screening of small molecules modulators of the Fanconi anemia pathway (extensive protein network that modulates human cancer susceptibility).

- Validated the assay by testing known inhibitors of the human FA pathway.
- Optimized assay conditions: quantity and concentration of reagents, incubation times, tested variability between batches and experiments.
- Implemented the assay-based screening on a low-scale operation: ~800 compounds from 4 small libraries screened, 28 hits found.
- Further characterized one hit and confirmed its activity in human cells.
- Expanded the assay readout to allow screening of modulators of other DNA repair and checkpoint proteins and pathways.
- Filed one patent and submitted 2 disclosures regarding the Xenopus cell-free assay technology.
- Presented results at 3 international conferences.
- Awarded an Eli Lilly-AACR travel award.
- Submitted one manuscript.

Project 2: Characterization and investigation of the mechanism of action of analogs of curcumin potent inhibitors of the FA pathway.

- Established collaboration with chemists J.P. Snyder (Emory University, USA) and S. Padhye (Pune University, India)
- Evaluated the toxicity and activity of curcumin analogs in Xenopus egg extracts and in human cells
- Investigated the mechanism of inhibition of the most potent analogs.
- One manuscript in preparation.

Collaborations

- **Dr K. Mita,** National Institute of Agrobiological Sciences, Japan (2000-2002): S. frugiperda EST sequencing project; comparative analysis with EST libraries from the silkworm Bombyx mori.

- **V. Serrano-Pinto,** Centro de Investigaciones Biológicas del Noroeste, Mexico (2001): analysis of the synthesis of vitellogenin during crayfish oocyte maturation.

- **Dr A.N. Volkoff,** INRA, France (2002): Comparative analysis of insect defensins.

- **Dr A.A. Deodhar,** Oregon Health and Science University (2005-2006): clinical investigation of the presence of SSRP1 apoptotic fragments in the serum of patients with Systemic Lupus Erythematosus.

- **Dr J.P. Snyder,** Emory University, USA (2006-present): Characterization of curcumin analogs with improved anticancer activity and water solubility.

- **Dr S. Padhye,** University of Pune, India (2006-present): initial characterization of 27 curcumin analogs.

- **Dr L.L. David,** Oregon Health and Science University (2008-present): Mass spectrometry-based identification of post-translational modifications of proteins in DNA-activated Xenopus cell-free extracts.

Career development

Awards

- American Society of Virology travel award, Annual Meeting of the American Society of Virology, July 2001, Madison, USA.
- Eli Lilly-AACR Scholar-in-training award, AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics, October 2007, San Francisco, USA.

Grants

- Bourse MENRT, French Department of Research and Technology (1999-2002)
- NIH-NRSA Cancer Biology Training grant (2006-2008).

Patents

- Hoatlin M, Stone S, Sobeck A, Costanzo V, Gautier, J, **Landais, I**. Cell-free screening assay and methods of use. International application number #PCT/US2006/040906, International publication number #WO 2007/067261 A1

Peer-reviewing

- **2005-2007:** Journal of Microbiology, BMC Genomics

Publications

- **Landais I,** Chavigny P, Castagnone C, Pizzol J, Abad P, Vanlerberghe-Masutti F (2000) Characterization of a highly conserved satellite DNA from the parasitoid wasp *Trichogramma brassicae*. *Gene* 255: 65-73.

- **Landais I,** Pommet J, Mita K, Nohata J, Gimenez S, Fournier P, Devauchelle G, Duonor-Cerutti M, Ogliastro M (2001) Characterization of the cDNA encoding the 90 kDa heat-shock protein in the Lepidoptera *Bombyx mori* and *Spodoptera frugiperda*. *Gene* 271: 223-31.

- Volkoff AN, Rocher J, d'Alencon E, Bouton M, **Landais I,** Quesada-Moraga E, Vey A, Fournier P, Mita K, Devauchelle G (2003) Characterization and transcriptional profiles of three *Spodoptera frugiperda* genes encoding cysteine-rich peptides. A new class of defensin-like genes from lepidopteran insects? *Gene* 319: 43-53.

- **Landais I,** Ogliastro M, Mita K, Nohata J, Lopez-Ferber M, Duonor-Cerutti M, Shimada T, Fournier P, Devauchelle G. (2003) Annotation pattern of ESTs from *Spodoptera frugiperda Sf*9 cells and analysis of the ribosomal protein genes reveal insect-specific features and unexpectedly low codon usage bias. *Bioinformatics* 19: 2343-50.

- Serrano-Pinto V, **Landais I,** Ogliastro MH, Gutierrez-Ayala M, Mejia-Ruiz H, Villarreal-Colmenares H, Garcia-Gasca A, Vazquez-Boucard C (2004) Vitellogenin mRNA expression in *Cherax quadricarinatus* during secondary vitellogenic at first maturation females. *Mol Reprod Dev* 69: 17-21.

- **Landais I,** Vincent R, Bouton M, Devauchelle G, Duonor-Cerutti M, Ogliastro M (2006) Functional analysis of evolutionary conserved clustering of bZIP binding sites in the baculovirus homologous regions (hrs) suggests a cooperativity between host and viral transcription factors. *Virology* 344: 421-31.

- **Landais I,** Lee H, Lu H (2006) Coupling caspase cleavage and ubiquitin-proteasome-dependent degradation of SSRP1 during apoptosis. *Cell Death Differ* 13: 1866-78

- Li Y, Zeng SX, **Landais I,** Lu H (2007) Human SSRP1 has Spt16-dependent and independent roles in gene transcription. *J Biol Chem* 282: 6936-45

Submitted

- **Landais I,** Li Y, Kumari A, Lu H. SSRP1 recruitment to genes undergoing transcription depends on the DNA-binding activity of its HMG-1 box.

- **Landais I,** Sobeck A, Stone S, LaChapelle A, Hoatlin MEH. A novel cell-free screen for small molecule inhibitors of the Fanconi anemia/BRCA pathway.

Selected presentations at international conferences

- **Landais I,** Vincent R, Robert L, Galibert L, Devauchelle G, Duonor-Cerutti M, Ogliastro M. Cooperativity between the baculovirus IE1 transcription factor and host CRE-like binding factors to activate hr5-dependent transcription. Oral presentation, *Annual Meeting of the American Society of Virology*, July 2001, Madison, USA.

- **Landais I,** Pommet JM, Mita K, Nohata J, Gimenez S, Fournier P, Devauchelle G, Duonor-Cerutti M, Ogliastro M. Characterization of the cDNA encoding the 90 kDa heat-shock protein in the Lepidoptera *Bombyx mori* and *Spodoptera frugiperda*. Oral presentation, *Fifth International Workshop on Molecular Biology and Genetics of the Lepidoptera*, August 2001, Kolympari, Greece.

- **Landais I,** Mita K, Nohata J, Gimenez S, Ogliastro M, Duonor-Cerutti M, Feyereisen R, Lopez-Ferber M, Devauchelle G, Fournier P. *Spodoptera frugiperda* gene expression analysis using EST. Poster, *Fifth International Workshop on Molecular Biology and Genetics of the Lepidoptera*, August 2001, Kolympari, Greece.

- **Landais I,** Sobeck A, Stone S, LaChapelle A, Padhye S, Snyder J, Hoatlin ME. A Xenopus cell-free assay for screening of compounds that modulate the Fanconi anemia pathway. Poster, *Nineteenth Annual Fanconi Anemia Research Fund Scientific Symposium*, October 2007, Chicago, USA.

- **Landais I,** Sobeck A, Stone S, LaChapelle A, Padhye S, Snyder J, Hoatlin ME. A novel cell-free screen for drugs that modulate the human Fanconi/breast cancer susceptibility protein network. Poster, AACR-NCI-EORTC Molecular targets and Cancer Therapeutics International Conference, October 2007, San Francisco, USA.

Teaching and mentoring

- **1997-1998:** High School teacher, Lycee Pierre de Fermat, Toulouse, France: in charge of the Biology courses for two classes (10^{th} and 11^{th} grades).
- **2000:** Mentoring of a summer intern, L. Galibert.
- **2001:** Mentoring of a visiting graduate student, V. Serrano-Pinto.
- **2007:** Mentoring of a summer intern, V. Wong.

References

- **Maureen E. Hoatlin, PhD** (PI, Oregon Health and Science University, USA)
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- **Hua Lu, MD, PhD** (PI, Indiana University, USA)
  hualu@iupui.edu, phone : 317-278-0920

- **Philippe Fournier, PhD** (Unit Director, INRA, France)
  fourniep@ensam.inra.fr, phone : +33 4 67 14 41 13

- **Gérard Devauchelle, PhD** (Research Director, Professor emeritus, CNRS, France)
  gerard.devauchelle@montp.cnrs.fr, phone : +33 4 66 91 21 72