

Samuel PÉAN

PhD in Behavioral Ecology

Date of birth: January 24th, 1984
Location: Paris, France

Email: contact@samuelpean.com
Web: www.samuelpean.com/about

I study fish behavior using video analysis or self-feeding systems. During my PhD thesis on the effects of PCBs on common sole and zebrafish behavior, I built my own tools and set up my own video tracking protocols (based on Noldus Ethovision software). I successfully adapted these tools to answer other questions such as measuring the effects of tagging or aquaculture selection on fish behavior, taking into account the requirements of the species (rainbow trout, zebrafish, common sole, sea bass) and the life stage (larvae, juvenile adult).

Research interests

Fish behavior
Fish welfare

Ecology
Ecotoxicology

Video / image analysis
Computer programming

Education

2008-2012: PhD fellow in Biological Oceanography and Marine Environment, University of La Rochelle (France).

2007-2008: Master diploma (2nd year) in Sustainable Exploitation of Coastal Ecosystems, University of La Rochelle (France).

2006-2007: Master diploma (1st year) in Ecology and Coastal Environment, University of La Rochelle (France), with honors.

2005-2006: Licence diploma in General Biology, University of La Rochelle (France).

2002-2005: General University diploma, Biology and Oceanography, University of La Rochelle (France).

2002: Scientific High School Diploma, Niort (France)

Research experience

2008-2012: PhD Student at the French Research Institute for Exploration of the sea (Ifremer).

Subject: Effects of organic pollutant on zebrafish (*Danio rerio*) and common sole (*Solea solea*) behavior (Founded by Ifremer and Poitou-Charentes council).

Advisors: Dr Marie-Laure BÉGOUT and Dr Xavier COUSIN.

I essentially investigated on how Polychlorinated Biphenyls (PCBs) could affect both zebrafish and common sole locomotor behavior (using Noldus Ethovision video-tracking software), and sole cryptic abilities (burying behavior and color adaptation). Fish were exposed through diets to two PCBs mixtures at two doses mimicking known environmental contamination levels and congener composition. Common sole exposed to PCBs showed diminished cryptic capacities. Both contaminated common sole and zebrafish showed an altered locomotor behavior, and this alteration has been also found in the zebrafish offspring obtained from this contaminated generation.

July 2008 – September 2008: Research engineer, Ifremer, La Rochelle (FRANCE).

Subject: Fish personality as a measure of phenotypic plasticity in rainbow trout clones.

Advisor: Dr Marie-Laure BÉGOUT.

We investigated the genetic basis and adaptive importance of behavioral individuality through the analysis of fish reactions to different experimental situations. Seven to ten rainbow trout isogenic lines were screened using two types of behavioral tests to analyse the spatial exploratory behavior and flight response toward a stressor and to evaluate the risk taking behavior. This study revealed that even if live experiences and learning process played an important role in fish personality expression, it is also genetically determined.

January 2008 – June 2008: Master 2nd year internship, Ifremer, La Rochelle (FRANCE).

Subject: Self-feeding behavior changes induced by a second generation of domestication or selection for growth in the European sea bass, *Dicentrarchus labrax*.

Advisors: Dr Marie-Laure BÉGOUT, Sandie MILLOT.

We used one population produced from parents domesticated for two generations (Domesticated) and one produced from parents selected for growth for two generations (Selected). Self-feeding activity and growth performance were measured during 84 days. After a control period, the fish were submitted twice, at three-week intervals, to an acute stress treatment consisting of draining the tank and leaving the fish out of water for one minute. Both self-feeding activity and growth performance were altered by the acute stress treatment. The process of selection for growth led to a final, better growth, but did not seem to improve fish acute stress tolerance.

April 2007 – August 2007: Master 1st year internship, International Marine Centre (IMC), Oristano (ITALY).

Subjects: Evaluation of aquaculture domestication on European sea bass escape response / Effect of temperature and hypoxia on mullet (*Mugil cephalus*) swimming performances.

Advisors: Dr Christel LEFRANÇOIS, Dr Paolo DOMENICI.

April 2006 – July 2006: Licence internship, Laboratory of Biology and Marine Environment (LBEM), University of La Rochelle (FRANCE).

Subject: Effects of cadmium on sea bass escape response.

Advisor: Dr Anne AUBERT.

Software development

All these programs are downloadable for free on my website at: www.samuelpean.com.



Observational Data Recorder (ODRec) – written in Visual Basic:

ODRec is a free software to easily code behaviors from video. The software allows the user to control video playback (play, pause, 0.1x to 8x) and to record behaviors' occurrences by a simple key press. Once the acquisition is done, user can export data to a pre-calculated Excel file (containing raw data but also some basic statistics and graphs) or replay the video synchronized with the acquired data in ODView.

Heatmap From Stack – ImageJ plugin written in Java:

This ImageJ plugin is a qualitative AND QUANTITATIVE method to calculate the preferential place of an individual or a group. Once your video has been converted as image sequence for ImageJ, the plugin analyses the sequence frame by frame to record individuals' positions. The outputs are a combined heatmap graph and a table with the numerical score of each sub-area.

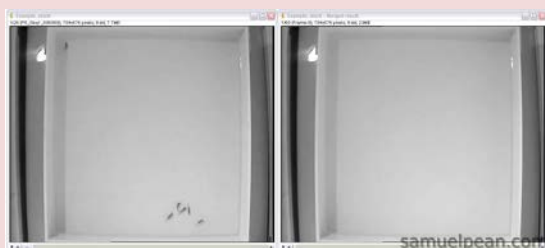
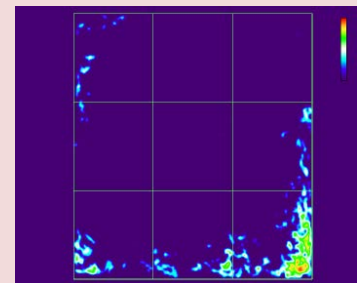


Image Stack Merger Plus – ImageJ plugin written in Java:

This plugin permits to delete the moving subjects from a video. It creates a clean background reference image. As the output can be a single image or a video sample, this plugin is useful for both Ethovision, Loligo and ImageJ users.

Skills

Laboratory skills:

- Degree authorisation for the use of laboratory animal (National Veterinary School, Nantes, FRANCE).
- Fish husbandry techniques.
- Fish tagging: PIT-tags (rainbow trout, sea bass), Nanotec[®] glass tags (zebrafish, juvenile of common sole), VI-alpha (juvenile of common sole).
- Blood and organs sampling (sea bass, common sole).
- Establishment of video recording systems with infra-red lightning (juvenile of sole, zebrafish larvae and adults).
- Self-feeding system set up.

Computing skills:

- General office applications: Microsoft Office Suite, OpenOffice/LibreOffice, TeXmaker (LaTeX processing), EndNote / JabRef, Mozilla Firefox / Internet Explorer, Thunderbird / Outlook.
- Image and video: ImageJ, Noldus Ethovision, IC Capture, Visilog, The Gimp / Adobe Photoshop, VirtualDub.
- Programming languages: LaTeX, Visual Basic (including Excel VBA), Java, PHP, SQL, and HTML
- Operating Systems: Linux Ubuntu, Windows XP-Vista-7.

Language skills:

- Fluent English (both spoken and written).
- Reasonable understanding of Spanish (both spoken and written).
- Reasonable understanding of spoken Italian.

Other skills:

- Supervised practicals for undergraduate students in Biology in the computer science department (Excel, OpenOffice Calc, and Dreamweaver).
- Statistical software: extensive experience with Statistica, Prism and XL Stat.
- Writing and presenting reports.
- Driving licence.

Participation in research programs

European:

- **SEAFOODplus, Ethiqua!**: Ethical quality traits in farmed fish: the role of husbandry practices and aquaculture production systems. <http://www.seafoodplus.org/Home.326.0.html> contract n° FOOD-CT-2004-506359.
- **FASTFISH**: Development of new operational indicators for on farm assessment and documentation of stress levels and fish welfare in Atlantic salmon and European sea bass farms. <http://fastfish.imr.no/start> contract n° 022720

National:

- **ConphyPOP**: Effects of PAHs exposure on zebrafish physiology and behavior, ANR (Agence Nationale de la Recherche) research agency.
- **GénérationPOP**: Transgenerational and long term effects of persistent organic pollutants (POPs) exposure on zebrafish, CNRS-INSU (Centre National de Recherche Scientifique – Institut national des sciences de l'Univers) research agency, project EC2CO-Cytrix (Écosphère continentale et côtière – Cycles hydro-biogéochimiques, transferts et impact écotoxicologique).
- **SoleBeMol**: Effects and future of pollutants on common sole: biological response from individual to population, ANR (Agence Nationale de la Recherche) research agency.
- **COSADD**: Criteria and objectives of animal selection for a sustainable development, ANR (Agence Nationale de la Recherche) and ADD (Agriculture et Développement Durable) research agencies.

Peer reviewed publications

Accepted / published:

- Péan S.**, Daouk T., Vignet C., Lyphout L., Leguay D., Loizeau V., Cousin X., Bégout M.-L. (*In press*). Long-term food-exposure to a mixture of non-coplanar PCBs induces behavioral disruptions in zebrafish adults and their offspring. *Neurotoxicology and Teratology*.
- Vignet C., Bégout M.-L., **Péan S.**, Lyphout, L., Leguay D., Cousin X. (*In press*). Systematic screening of behavioural responses in two zebrafish lines. *Zebrafish*.
- Benhaïm D., Bégout M.-L., **Péan S.**, Manca M., Prunet P., Chatain B. (2013). Impact of a plant-based diet on behavioural and physiological traits in sea bass (*Dicentrarchus labrax*). *Aquatic Living Resources*, 26(2): 121-131.
- Benhaïm D., **Péan S.**, Lucas G., Blanc N., Chatain B., Bégout M.-L. (2013). Early life behavioural differences in wild caught and domesticated sea bass (*Dicentrarchus labrax*). *Applied Animal Behaviour Science*, 141(1-2): 79–90.
- Cousin X., Daouk T., **Péan S.**, Lyphout L., Schwartz M.-É., Bégout M.-L. (2012). Electronic individual identification of zebrafish using radio frequency identification (RFID) microtags. *Journal of Experimental Biology*, 215: 2729-2734.
- Benhaïm D., Bégout M.-L., **Péan S.**, Brisset B., Leguay D., Chatain B (2012). Effect of fasting on self-feeding activity in juvenile Sea bass (*Dicentrarchus labrax*). *Applied Animal behavior*, 136(1): 63-73.
- Benhaïm D., **Péan S.**, Brisset B., Leguay D., Bégout M.-L., Chatain B. (2011). Effect of size grading on sea bass (*Dicentrarchus labrax*) juveniles self-feeding behavior, social structure and culture performances. *Aquatic Living Resources*, 24(04): 391-402.
- Millot S., **Péan S.**, Chatain B., Bégout M.-L. (2011). Self-feeding behavior changes induced by a first and a second generation of domestication or selection for growth in the European sea bass (*Dicentrarchus labrax*). *Aquatic Living Resources*, 1: 53-61.
- Millot S., **Péan S.**, Leguay D., Vergnet A., Chatain B., Bégout M.-L. (2010). Evaluation of behavioral changes induced by a first step of domestication or selection for growth in the European sea bass (*Dicentrarchus labrax*): a self-feeding approach under repeated acute stress. *Aquaculture*, 306: 211-217.

Congresses

Oral communications:

- Péan S.**, Daouk T., Vignet C., Lyphout L., Leguay D., Loizeau V., Cousin X., Bégout M.-L. (2012). Long-term food exposure to PCB mixtures induces behavioural disruptions in adult zebrafish and their offspring. Annual Symposium of the Fisheries Society of the British Isles (FSBI), Norwich, United-Kingdom, July 2012.
- Vignet C., Le Menach K., **Péan S.**, Lyphout L., Leguay D., Budzinski H., Bégout M.-L., Cousin X. (2012). Long term effects of an early exposure to PAHs on zebrafish behavioural responses. Annual Symposium of the Fisheries Society of the British Isles (FSBI), Norwich, United-Kingdom, July 2012.
- Péan S.**, Daouk T., Loizeau V., Cousin X., Bégout M.-L. (2010). Effects of PCBs on zebrafish behavior. *9th International Congress on the Biology of Fish*. Barcelona, Spain, June 2010.
- Bégout M.-L., Dupont-Nivet M., Quillet E., Prunet P., Millot S., **Péan S.**, Chatain B. (2009). Adaptation and welfare evaluation criteria. *Second seminar on Domestication in Aquaculture*, Montpellier, France, November 2009.

- Lyphout L., **Péan S.**, Schwartz M.-E., Bégout M.-L., Cousin X. (2009). Individual identification of zebrafish using NONATEC® RFID tags. *DareNET workshop*, Bilbao, Spain, November 2009.
- Millot S., **Péan S.**, Mayeras A.-L., Labbé L., Dupont-Nivet M., Bégout M.-L. (2009). Fish personality as a measure of phenotypic plasticity in rainbow trout clones. International Ethological Conference, Rennes, France, August 2009.
- Millot S., **Péan S.**, Bégout M.-L., Chatain B. (2009). Chronic and acute stress effects on feeding behavior and growth performances of different European sea bass strain (*Dicentrarchus labrax*). *Wellfish meeting*, COST 867, Isafjordur, Iceland, June 2009.
- Péan S.**, Millot S., Bégout M.-L., Chatain B. (2009). Effects of chronic and acute stress on European sea bass (*Dicentrarchus labrax*) growth and feeding behavior. *Fourth Meeting of French Ichthyology*, Paris, France, March 2009.
- Lefrançois C., Luna Acosta A., Millot S., **Péan S.**, Bégout M.-L., Domenici P. (2008). Swimming performance and aerobic metabolic scope in domesticated strains of European sea bass, *Dicentrarchus labrax*. *International Congress on the Biology of Fish*, Portland, USA, August 2008.
- Posters:**
- Vignet C., Le Menach K., **Péan S.**, Lyphout L., Leguay D., Budzinski H., Bégout M.-L., Cousin X. (2012). Long term effects of an early exposure to PAHs on zebrafish behavioural responses. 6th SETAC World Congress / SETAC Europe 22nd Annual Meeting, Berlin, Germany, May 2012.
- Cousin X., Daouk T., **Péan S.**, Vignet C., Larcher T., Roupsard F., Lyphout L., Leguay D., Loizeau V., Bégout M.-L. (2012). Long-term food-exposure to PCB mixtures induces reproductive and behavioural disruptions in zebrafish. 6th SETAC World Congress / SETAC Europe 22nd Annual Meeting, Berlin, Germany, May 2012.
- Hunter E., **Péan S.**, Bégout M.L. (2011). Impacts of tagging on the common sole, *Solea solea*. *Eighth International Flatfish Symposium*, IJmuiden, The Netherlands, November 2011.
- Daouk T., **Péan S.**, Viquelin L., Vignet C., Lyphout L., Roupsard F., Leguellec A.M., Akcha F., Menard D., Burgeot T., Bégout M.-L., Loizeau V., Cachot J., Budzinski H., Cousin X. (2010). GénérationPOP: Effects of persistent organic pollutants exposure on fish early life stages and consequences on population by transgenerational studies. *Colloque de restitution des projets financés par EC2CO*. Toulouse, France, November 2010.
- Dupont-Nivet M., Prunet P., Bégout M.-L., Pellegrini P., Khaw H.L., Millot S., **Péan S.**, Aupérin B., Valotaire C., Rolland J., Kerneis T., Goardon L., Quillet E. (2010). Genetics of adaptation in rainbow trout: a multidisciplinary approach. *European Aquaculture Society*, Porto, Portugal, October 2010.
- Péan S.**, Daouk T., Mayeras A.-L., Besson M., Loizeau V., Cousin X., Bégout M.-L. (2010). From model to fisheries species: behavioral studies to reveal the potential effects of contaminant on fish population. *ICES ASC*, Nantes, September 2010.
- Péan S.**, Daouk T., Cousin X., Bégout M.-L. (2010). A contribution from Zebrafish behavioral ecologists. EU workshop: Zebrafish as a neurophysiological and neurobehavioral model? London, United-Kingdom, September 2010.
- Péan S.**, Mayeras A.-L., Loizeau V., Bégout M.-L. (2010). Effects of PCBs on common sole behavior. *Journées des Doctorants*, La Rochelle, France, April 2010. (*Best Poster Prize*)
- Péan S.**, Mayeras A.-L., Loizeau V., Bégout M.-L. 2009. Do PCBs affect fish behavior? *International Ethological Conference (IEC)*, Rennes, France, August 2009.