

> Nicolas Sapay

French, 26 September 1978

PH.D STUDENT IN STRUCTURAL BIOINFORMATICS

- **Contact** Institut de Biologie et Chimie des Protéines
Laboratory of Structural Bioinformatics and Structural NMR
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ACADEMIC PREPARATION

- **Since 2002** PhD student in structural bioinformatics
Institut de Biologie et Chimie des Protéines, Lyon, France
Laboratory of Structural Bioinformatics and Structural NMR
In-plane membrane anchor: bioinformatic and structural characterization by NMR and Molecular Dynamics
Advisor : Pr. Gilbert Deléage, Claude Bernard University (Lyon I)
- **2001 – 2002** Master degree of science in genomic/genomes analysis and molecular modelling
Denis Diderot University, Paris VII, France
- **1998 – 2001** Engineer degree in biological engineering
Blaise Pascal University, Clermont-Ferrand II, France
- **1996 – 1998** Technician degree in biological engineering
Blaise Pascal University, Clermont-Ferrand II, France
Animal experimentation degree (level II)
Université Blaise Pascal, Clermont-Ferrand II, France

PROFESSIONAL EXPERIENCES

- **Since 2002** Thesis
Institut de Biologie et Chimie des Protéines, Lyon, France
Laboratory of Structural Bioinformatics and Structural NMR
 - *Aim 1*: development of a bioinformatics prediction method of in-plane membrane anchors
 - *Aim 2*: structural characterization by NMR and molecular dynamics of the in-plane membrane anchor domain of the protein NS5A from the Bovine Viral Diarrhea Virus
- **2002, 2 months** Master of Science degree placement
Institut de Biologie et Chimie des Protéines, Lyon, France
Laboratory of Structural Bioinformatics and Structural NMR
In-plane membrane anchoring peptides in *Flaviviridae*, systematic sequence analysis
- **2001, 5 months** Engineer placement
Schering-Plough Corp., Dardilly, France
Laboratory of Immunological Research
Study of specific gene expression in dendritic cells using an Expressed Sequence Tags database
- **2000, 2 months** Engineer placement
Experimentation Centre on Fruits and Vegetables, Montauban, France
Qualitative and quantitative study of the melon preserving
from the harvesting to the consumer
- **1998, 2 months** Technician placement
Commissary of Atomic Energy, Grenoble, France
Laboratory of Hormono-Regulated and Tumoral Angiogenesis
Development of histological tools for the adrenal capillary network study

ACTIVITIES AND INTERESTS

Academic Drawing, Comics, Cooking, Origami, Opera

RESEARCH SKILLS

- **Structural biology**
Circular dichroism, liquid-state NMR, molecular modelling, molecular dynamics
- **Bioinformatic analysis**
Pair and multiple protein sequence alignments, consensus secondary structure prediction, profile HMM building and searching.
- **Statistics**
ANOVA, PCA
- **Algorithmic and development**
Supervised learning for small sequence motif recognition using support vector machines
Development of a Sparky plug-in used to check chemical shift assignments in NMR spectrum and create BMRB submission forms
Numerous scripts to analyze NAMD/CHARMM trajectories
- **Programming**
C, R, Perl, Python, TCL, shell, HTML
- **Software**
Procheck-NMR 3.5.4, VADAR, XPLOR-NIH 2.10, VNMR, Sparky 3.111, NAMD 2.5, CHARMM 27, VMD 1.8.3, PyMOL 0.98, Rasmol 2.7, MDTools for Python 0.62
- **Languages**
Fluent in French (native language) and in English (TOEIC score = 730/990), can understand some German

SCIENTIFIC COMMUNICATIONS

- **Publications**
NMR structure and molecular dynamics of the in-plane membrane anchor domain of NonStructural protein 5A from Bovine Viral Diarrhea Virus
Sapay N., Montserret R., Chipot C., Brass V., Moradpour D., Deléage G. and Penin F., *Biochemistry*, accepted
Determinants of the membrane association of the NonStructural protein 5A from Hepatitis C virus, GB viruses and pestiviruses
Brass V., Pal Z, Sapay N., Penin F., Blum H.E. and Moradpour D., *in preparation*
Molecular dynamics simulation of the in-plane membrane anchor domain of the NonStructural Protein 5A from Bovine Viral Diarrhea Virus in a phosphatidylcholine bilayer model
Sapay N., Montserret R., Chipot C., Deléage G. and Penin F., *in preparation*
Prediction of amphipathic in-plane membrane anchors in monotopic proteins using a SVM classifier
Sapay N., Guermeur Y. and Deléage G., *submitted*.
Differential expression of VEGF receptors in adrenal atrophy induced by dexamethasone: a protective role of ACTH
Mallet C., Feraud O, Ouengue-Mbele G, Gaillard I, Sapay N, Vittet D, Vilgrain I., *Am J Physiol Endocrinol Metab.* 2003; **284**(1):E156-67.
- **Communications**
Prediction of amphipathic in-plane membrane anchors in monotopic proteins using a SVM classifier
Sapay N., Montserret Y. and Deléage G., *Meeting of the French Bioinformatics Society.* Jul 2005, Lyon, France
Structural characterization by NMR and molecular dynamics of the in-plane membrane anchor domain of the NonStructural protein 5A from the Bovine Viral Diarrhea Virus
Sapay N., Montserret R., Chipot C., Brass V., Moradpour D., Deléage G. and Penin F., *13th meeting of the Group of Molecular Graphism & Modeling of the French Society of Biochemistry and Molecular Biology.* May 2005, Embiez island, France.

NMR study of the in-plane membrane anchor domain of the NonStructural protein 5A from the Bovine Viral Diarrhea Virus

Sapay N., Montserret R., Brass V., Moradpour D., Deléage G., Penin F., *Annual meeting of the « Membrane Proteins » brainstorming group of the CNRS*. Oct 2004, Saulieu, France

Unexpected similarities between in-plane membrane anchoring amphipathic helices of Hepatitis C Virus and *Picornaviridae* family members

Sapay N., Penin F., Moradpour D., Deléage G., *Annual meeting of the EDISS students*. Apr 2004, Lyon, France

Systematic sequence analysis of in-plane membrane domain of Hepatitis C Virus and related viruses

Sapay N., Penin F., Moradpour D., Deléage G., *Annual meeting of the « Membrane Proteins » brainstorming group of the CNRS*. May 2004, Dinard, France

Determinants for membrane association of NS5A proteins from Hepatitis C Virus and related viruses

Pal Z., Brass V., Sapay N., Penin F., Blum H.E., Moradpour D., *5th young investigators meeting of the Swiss Association for Gastroenterology and Hepatology*. May 2004, Geneva, Switzerland

▪ Posters

NMR structure and molecular dynamics at the membrane interface of the in-plane membrane anchor domain of NonStructural protein 5A from Bovine Viral Diarrhea Virus

Sapay N., Chipot C., Montserret R., Brass V., Moradpour D., Penin F. and Deléage G., *12th International Symposium on Hepatitis C Virus and related viruses*. Oct 2005, Montreal, Canada

Structural analysis of membrane association domain of NonStructural protein 5A from Hepatitis C virus and related viruses

Sapay N., Montserret R., Penin F., Deléage G., *Peptide-membrane interactions*. Oct 2004, Namur, Belgium

Structural and bioinformatic study of amphipathic membrane insertion peptides

Sapay N., Montserret R., Penin F., Deléage G., *Annual congress of the French Society of Biochemistry and Molecular Biology*. Nov 2003, Lyon, France

▪ Seminar

Bioinformatic study of amphipathic membrane insertion peptides

Guest by Yann Guermeur, *Laboratoire Lorrain de Recherche en Informatique et ses Applications*. May 2004, Nancy, France

REFEREES

▪ Pr. Gilbert DELEAGE, Claude Bernard University

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▪ Dr. François PENIN, Centre National de la Recherche Scientifique

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▪ Dr. Christophe CHIPOT, Centre National de la Recherche Scientifique

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Laboratory of Membrane Assembly Dynamics
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▪ Dr. Yann GUERMEUR, Centre National de la Recherche Scientifique

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Laboratory of Informatics Model in Molecular Biology
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