**Fredy SIEGRIST**
Schnbergweg 11
CH-3006 Bern
+41 31 511 0512

Objective: Master in Bioinformatics and Computational Biology

## EDUCATION

2016 (ongoing), Universities of Bern and Fribourg, Switzerland, Master in Bioinformatics, English.

2011, Apr 13, University of Basel, Switzerland, PhD Cell Biology, English.

2003, Oct 24, University of Bern, Switzerland, Master Biochemisty, German.

1999, Jun 17, Gymnasium Bern-Kirchenfeld, Switzerland, Matura type C, German.

## ACTIVITIES

**Editorial Acitivities and Teaching**

Served as referee for: BMC Research Notes (BioMed Central), International Journal of Interferon, Cytokine and Mediator Research (Dove Press).

Modular course in Clinical Medicine for bachelor students (University of Basel) Tracking down genes modern genetics in clinical research

**Administration**

Administrative Board Member, Moosbad Immobilien AG, Emmenmatt, Switzerland

**Publication Record**

h index / Sum of the Times Cited (Web of science)
5 / 317

**Computer Experience**

Programming Langugaes (OO): R, PHP5, Python, Java. Programming Langugages (procedural, script): Unix-Bourne-Shell / bash, DOS-Batch, GW-BASIC. Operating Systems: Windows, Ubuntu, MAC-OS, MS-DOS. Software: MS Office / LibreOffice, Oracle VM Virtual Box CMS: OpenText, Joomla, Adobe Experience Manager, LSF / SGE Networks: Windows Server, Novell NetWare Databases: SQL / MySQL, MS Access

**Work Experience**

Publisher (CMS), Webeditor, IT-Support, Brewery Assistant.

## EMPLOYMENT

**Publisher,** Federal Food Safety and Veterinary Office, Liebefeld, Switzerland 2016, Feb - Mai

**Scientific Associate,** Clinic of Nephrology, Bern University Hospital, Switzerland 2014, Feb - Jul

**Post-doc,** Laboratory of Virology, University Hospitals of Geneva, Switzerland 2011, Mar - 2013, Feb

**PhD,** Molecular Medicine and Toxicology, Roche, Basel, Switzerland 2006, Mar - 2010, Sep

**Trainee,** Functional Genomics, Novartis, Basel, Switzerland 2004, Apr - 2005, Mar

## SCIENTIFIC AFFILIATIONS

2016 International Society for Computational Biology
2008 - 2014 International Society for Interferon and Cytokine Research

## PROJECT SUMMARIES

**Short-term scientific associate, University Hospital of Bern** *Department of Nephrology, Hypertension and clinical Pharmacology; Prof B. Frey Department of medical Oncology; Dr M. Zweifel* Genome-mutations in the androgen-receptor ligand-binding domain in mamma- and ovarian carcinomas
Mutations in the androgen-receptor ligand-binding domain is addressed by next-generation sequencing in mamma-, ovarian- and prostate-cancer samples. Driver mutations will be analysed in-vitro for sensitivity to dihydrotestosteron derivatives in reporter assays. *Department of Nephrology; Prof U. Huynh-Do* Genomic analyses of chronic hypoxia exposed fetal kidneys
Kidney from mice embryos hold in a hypoxia chamber were analysed by microarrays and significant genes are verified by qPCR, in-situ hybridization and immunohistochemistry to validate expression. Epigenetic DNA status (MetC and hMetC) of candidate genes will be assessed by MeDIP-qPCR.

**Post-doctoral position, University Hospitals of Geneva** *Laboratory of Virology; Prof L. Kaiser and Dr C. Tapparel* Small RNA sequencing of rhinovirus infections
Deep sequencing data from small RNA Illumina libraries were analysed in rhinovirus infected cell culture samples, small viral RNAs are detected and human miRNA quantified. HeLa cells were infected with different rhinovirus types. Viral RNA fragments and human miRNAs were analysed with northern blots, primer extension and rapid amplification of cDNA ends assays. Impact of RNA fragments on viral replication and translation was addressed with quantitative PCR, Luciferase and immuno-fluorescence.

**PhD Thesis, F. Hoffmann-La Roche AG** *Molecular Medicine Laboratories; Prof U. Certa* SOCS proteins in IFN silencing
Function of SOCS Proteins in IFN signalling was studied by gene expression analysis with semi quantitative RT- qPCR. Selected candidates were cloned in a mammalian expression vector and fusion proteins with SNAP-tag (Covalys) were cloned and analysed with fluorescence microscopy. Stable SOCS expressing cell lines were generated and characterized for their interferon response by gene and miRNA expression microarrays and statistical analysis with R/Bioconductor. Bimolecular fluorescence complementation with eYFP and STAT1/2 fusion proteins was insensitive to STAT activation by IFN, but localization of STAT fusion proteins as for untagged dimers.
Cell-to-cell transfer of a proliferation control protein (IFITM3)
The transfer of IFITM3 proteins from a generator cell to a recipient cell was assessed by fluorescence microscopy, eYFP marked cell lines were sorted by FACS and analysed for protein transfer by immunoblotting. Protein transfer and proliferation assay (metabolite calorimetry, BrdU ELISA, FACS) excluded transfer of cytostatic effect. Phylogenetic analyses demonstrated recent IFITM gene development.

**Traineeship, Novartis Pharma AG, NIBR, Basel** *Functional Genomics Group; Dr F. Natt* siRNA stability in biological fluids
Obstacles for siRNA therapeutics are siRNA delivery and the short half-life of non-modified oligonucleotides. I have established a method for rapid analysis of degradation and demonstrated benefit of novel siRNA modifications (especially at their 3 overhang) for serum stability. I synthesized siRNA derivatives together with hydrolysis-stable MOE-RNA standard marker and analysed degradation of differently modified siRNA with HPLC, CE and Gel- electrophoresis. Furthermore, I have specified mechanism of degradation using LC-MS.

**Diploma Thesis, University of Bern** *Department of Chemistry and Biochemistry; Prof R. Haener* Construction and analysis of a cis-acting Ribonucleasemimic
Ribozyme mimics are generally linked to a nucleic-acid-backbone for specific recognition of the targeted gene transcripts. Efficient substitutes for the big catalytic domain are metal complexes like Cutrpy for example. I have demonstrated self-cleavage of a RNA-Cutrpy-based ribozyme mimic at a specific phosphordiester bond. Main work involved the RNA backbone design (single bulge cleaving site), RNA modification (functional and radioactive / fluorescence labelling) and purification. Finally, triggering of cleavage and analysis of RNA degradation (PAGE).

## PUBLICATIONS

**Original articles published or accepted in peer reviewed journals (IF 2012)**

Scott R, Siegrist F, Foser S, Certa U. Interferon-alpha induces reversible DNA demethylation of the IFITM3 core promoter in human melanoma cells. J Interferon Cytokine Res 2011 Aug 11; 31(8):601-8. IF: 3.3

Cortzar D, Kunz C, Selfridge J, Lettieri T, Saito Y, MacDougall E, Wirz A, Schuermann D, Jacobs A, Siegrist F, Steinacher R, Jiricny J, Bird A, Schr P. Embryonic Lethal Phenotype Reveals a Function of TDG in Maintaining Epigenetic Stability. Nature 2011 Feb 17; 470 (7334): 419-423. IF: 38.6

Siegrist F, Singer T, Certa U. MicroRNA Expression Profiling by Bead Array Technology in Human Tumor Cell Lines Treated with Interferon-Alpha-2a. Biol Proced Online 2009 Dec; 11 (1): 113-29. IF: 1.0

Hallen LC, Burki Y, Ebeling M, Broger C, Siegrist F, Oroszlan-Szovik K, Bohrmann B, Certa U, Foser S. Antiproliferative Activity of the Human IFN-alpha-Inducible Protein IFI44. J Interferon Cytokine Res 2007 Aug; 27 (8): 675-80. IF: 3.3

**Reviews published or accepted in peer reviewed journals (IF 2012)**

Tapparel C, Siegrist F, Petty TJ, Kaiser L. Picornavirus and enterovirus diversity with associated human diseases. Infect Genet Evol. 2013; 14: 282-293. IF: 2.8

Siegrist F, Ebeling M, Certa U. The small interferon induced transmembrane genes and proteins. J Interferon Cytokine Res 2011 Jan; 31 (1): 183-97. IF: 3.3

**Original articles, reviews, editorials, letters, published or accepted in non-peer reviewed journals**

Siegrist F, Certa U. Micro RNA Induction by Interferon Alpha and a Potential Role to Interfere with SOCS. In 7th Joint Conference Montral, Qubec, Canada, October 12-16, 2008 Editor: John Hiscott. Medimont International Proceedings 2008: 93-97.

**Thesis**

Siegrist F. Transcriptional responses of tumor cell lines to interferon-alpha. PhD Thesis, cell biology, University of Basel 2011.

Siegrist F. Auf der Spur eines artifiziellen, selbstspaltenden RNA-Molekls. Diplomathesis, Master of biochemistry, University of Bern 2003.

**Abstracts presented at international and national meetings**

Siegrist F, Otten-Hernandez P, Thomas Y, Farinelli L, Kaiser L and Tapparel C. Viral genome sequencing and small RNA detection by next generation sequencing. Cytokines 2012 Sep; 59(3): 565.

Siegrist F, Otten P, Thomas Y, Farinelli L, Kaiser L and Tapparel C. Viral genome sequencing and small RNA detection by next generation sequencing. 3rd Swiss Funtamental Virology Workshop 2011 Aug.

Urfer PM, Siegrist F, Noreen F, Weis S, Certa U, Truninger K, Schr P. Integrating transcriptome and epigenome analyses to identify DNA methylation changes associated with colorectal carcinogenesis. BioValley Science Day 2010 Sep.

Cortazar D, Kunz C, Selfridge J, Lettieri T, Wirz A, Schrmann D, Jacobs A, Siegrist F, Jiricny J, Bird A, Schr P. Embryonic lethality of TDG-deficient mice reveals a function of TDG in the maintenance of epigenetic stability. BioValley Science Day 2010 Sep.

Siegrist F, Certa U. Suppression of interferon alpha mediated gene expression by SOCS1 and SOCS3. FEBS-Special Meeting: Jak-Stat Signalling: from Basics to Disease 2010 Feb.

Siegrist F, Ebeling M, Certa U. Phylogenetic analysis of interferon inducible transmembrane gene family and functional aspects of IFITM3. Cytokine 2009 Oct-Nov; 48 (1-2): 87.

Siegrist F, Certa U. Micro RNA induction by interferon alpha and their potential role to interfere in the negative feedback pathway. Cytokine, 2008 Sep; 43 (3): 284-285.

Scott RW, Siegrist F, Burki Y, Foser S, Certa U. Methylation Status Influence On Interferon-alpha Sensitivity In Human Melanoma Cells. 3rd Swiss Meeting on Genome Stability DNA Dynamics and Epigenetics. 2007 Oct.

## PUBLISHED DATASETS

GSE16421, GSE20693, GSE21158, GSE22801, GSE37872, GSE37873, CY079542.2-CY079549.