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gruppleddare, Handledare för doktorandprogram, universitetslektor  
Forskningsprogrammet för molekylära och integrativa biovetenskaper  
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Doctoral Programme in Microbiology and Biotechnology  
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## !!Qualifications

Molecular Biology, Title of Docent (Adjunct Professor), Bio- och miljövetenskapliga fakulteten  
Tilldelningsdatum: 18 juni 2014

Molecular Virology, Doctor of Philosophy, Molecular mechanisms of bacteriophage phi6 RNA dependent RNA polymerase and its utilization in biotechnology., Bio- och miljövetenskapliga fakulteten  
1 nov. 2005 → 31 dec. 2010  
Tilldelningsdatum: 18 jan. 2011

General Microbiology, Master of Science, Expression and purification of RNA-dependent RNA polymerases from novel RNA viruses, Bio- och miljövetenskapliga fakulteten  
1 feb. 2005 → 31 okt. 2005  
Tilldelningsdatum: 19 okt. 2005

### **Forskningsledare (Principal Investigator)**

Tidsperiod : 01.09.2016 - \* i Forskningsprogrammet för molekylära och integrativa biovetenskaper

## !!Employments

### **universitetslektor**

Forskningsprogrammet för molekylära och integrativa biovetenskaper  
Helsingfors universitet  
Finland  
15 okt. 2019 → present

### **gruppleddare**

RNAcious laboratory  
Helsingfors universitet  
1 sep. 2016 → present

### **Handledare för doktorandprogram**

Doctoral Programme in Microbiology and Biotechnology  
Helsingfors universitet  
Finland  
1 jan. 2020 → present

### **Handledare för doktorandprogram**

Doctoral Programme in Integrative Life Science  
Helsingfors universitet  
Finland

1 aug. 2017 → present

### **Visiting Scientist**

Max Planck Institute for Molecular Biomedicine  
Tyskland

1 jan. 2016 → 31 aug. 2016

### **Postdoctoral Research Fellow**

Max Planck Institute for Molecular Biomedicine  
Tyskland

1 mars 2012 → 31 dec. 2015

## **Publikationer**

### **Purification of micrococcal nuclease for use in ribosomal profiling of high-salinity extremophiles**

Gregorova, P., Isada, M., DiRuggiero, J. & Sarin, P., jan. 2025, I: *Journal of Biological Chemistry*. 301, 1, 11 s., 108020.

### **Long noncoding RNA EPCART regulates translation through PI3K/AKT/mTOR pathway and PDCD4 in prostate cancer**

Kohvakka, A., Sattari, M., Nättinen, J., Aapola, U., Gregorova, P., Tammela, T. L. J., Uusitalo, H., Sarin, P., Visakorpi, T. & Latonen, L., 15 aug. 2024, I: *Cancer Gene Therapy*. 31, 10, s. 1536-1546 11 s.

### **Deciphering the RNA Modification Landscape in Arabidopsis Chloroplast tRNAs and rRNAs Reveals a Blend of Ancestral and Acquired Characteristics**

Golebiewska, K., Gregorova, P., Sarin, P. & Gawronski, P., 15 juni 2024, (Insänt).

### **Global analysis of aging-related protein structural changes uncovers enzyme-polymerization-based control of longevity**

Paukštytė, J., López Cabezas, R. M., Feng, Y., Tong, K., Schnyder, D., Elomaa, E., Gregorova, P., Doudin, M., Särkkä, M., Sarameri, J., Lippi, A., Vihinen, H., Juutila, J., Nieminen, A., Törönen, P., Holm, L., Jokitalo, E., Krisko, A., Huiskonen, J. & Sarin, L. P. och 4 andra, Hietakangas, V., Picotti, P., Barral, Y. & Saarikangas, J., 21 sep. 2023, I: *Molecular Cell*. 83, 18, s. 3360-3376

### **Novel Insights into the Mechanisms of Microbial Transcription and Translation**

Sarin, P., 30 juni 2023, I: *Microorganisms*. 11, 7, 3 s., 1720.

### **Bacteriophage Infection of the Marine Bacterium *Shewanella glacialimarina* Induces Dynamic Changes in tRNA Modifications**

Lampi, M., Gregorova, P., Qasim, M. S., Ahlblad, N. C. V. & Sarin, P., feb. 2023, I: *Microorganisms*. 11, 2, 16 s., 355.

### **Proteiniinien rakennemuutosten kartoittaminen paljastaa, miten solut ikääntyvät**

Paukštytė, J., López Cabezas, R. M., Feng, Y., Tong, K., Schnyder, D., Elomaa, E., Gregorova, P., Doudin, M., Särkkä, M., Sarameri, J., Lippi, A., Vihinen, H., Juutila, J., Nieminen, A., Törönen, P., Holm, L., Jokitalo, E., Krisko, A., Huiskonen, J. & Sarin, L. P. och 4 andra, Hietakangas, V., Picotti, P., Barral, Y. & Saarikangas, J., 2023, I: *Duodecim*. 139, 19, s. 1575 1 s.

### **Learning from the Invaders: What Viruses Teach Us about RNA-Based Regulation in Microbes**

Sarin, P., 25 okt. 2022, I: *Microorganisms*. 10, 11, 7 s., 2106.

### **An improved RT-qPCR method for direct quantification of enveloped RNA viruses**

Gregorova, P., Heinonen, M.-M. K. & Sarin, P., 1 juni 2022, I: *MethodsX*. 9, 9 s., 101737.

### **Cold-active *Shewanella glacialimarina* TZS-4T nov. features a temperature-dependent fatty acid profile and putative sialic acid metabolism**

Qasim, M. S., Lampi, M., Heinonen, M.-M. K., Garrido-Zabala, B., Bamford, D., Käkelä, R., Roine, E. & Sarin, P., 1 okt. 2021, I: *Frontiers in Microbiology*. 12, 13 s., 737641.

**Developmental tissue differentiation of tRNA modification dynamics in European dewberry (*Rubus caesius* L.) callus formation and growth**

Hotti, H., Qasim, M. S., Kalaniemi, S. M. & Sarin, P., 21 juli 2021.

**Post-transcriptional transfer RNA modifications as modulators of heterologous protein production**

Hotti, H. & Sarin, P., 3 juli 2021.

**Broad-range RNA modification analysis of complex biological samples using rapid C18-UPLC-MS**

Gregorova, P., Sipari, N. & Sarin, P., 2021, I: *RNA Biology*. 18, 10, s. 1382-1389 8 s.

Nano LC-MS using capillary columns enables accurate quantification of modified ribonucleosides at low femtomol levels. Sarin, L. P., Kienast, S. D., Leufken, J., Ross, R. L., Dziergowska, A., Debiec, K., Sochacka, E., Limbach, P. A., Fufezan, C., Drexler, H. C. & Leidel, S. A., okt. 2018, I: *RNA*. 24, 10, s. 1403-1417 15 s.

**Transfer RNA modification and infection – implications for pathogenicity and host responses**

Koh, C. S. & Sarin, L. P., apr. 2018, I: *Biochimica et Biophysica Acta. Gene Regulatory Mechanisms*. 1861, 4, s. 419-432 14 s.

**tRNA modification as a virulence factor in pathogenic *Candida* species**

Böttcher, B., Morgner, B., Sarin, L. P., Allert, S., Jacobsen, I. D., Drexler, H. C., Leidel, S. A. & Brunke, S., aug. 2017, I: *Mycoses*. 60, SI, s. 13-14 1 s.

pyQms enables universal and accurate quantification of mass spectrometry data

Leufken, J., Niehues, A., Sarin, L. P., Wessel, F., Hippler, M., Leidel, S. A. & Fufezan, C., 20 juli 2017, I: *Molecular & Cellular Proteomics*. 16, 10, s. 1736-1745 10 s.

An evolutionary approach uncovers a diverse response of tRNA 2-thiolation to elevated temperatures in yeast.

Alings, F., Sarin, L. P., Fufezan, C., Drexler, H. C. & Leidel, S. A., 21 feb. 2015, I: *RNA*. 21, 2, s. 202-212 10 s.

**Efficient double-stranded RNA production methods for utilization in plant virus control**

Voloudakis, A. E., Holeva, M. C., Sarin, L. P., Bamford, D., Vargas, M., Poranen, M. & Tenllado, F., 2015, *Plant Virology Protocols: New Approaches to Detect Viruses and Host Responses*. Uyeda, I. & Masuta, C. (red.). USA: Humana press, Vol. 1236. s. 255-274 20 s. (Methods in Molecular Biology).

Modify or die?--RNA modification defects in metazoans.

Sarin, L. P. & Leidel, S. A., 2014, I: *RNA Biology*. 11, 12, s. 1555-1567 12 s.

**High-throughput purification of double-stranded RNA molecules using convective interaction media monolithic anion exchange columns**

Romanovskaya, A., Sarin, L. P., Bamford, D. & Poranen, M., 31 jan. 2013, I: *Journal of Chromatography. A*. 1278, s. 54-60 7 s.

**Structure of a VP1-VP3 complex suggests how birnaviruses package the VP1 polymerase**

Bahar, M. W., Sarin, L. P., Graham, S. C., Pang, J., Bamford, D. H., Stuart, D. I. & Grimes, J. M., 2013, I: *Journal of Virology*. 87, 6, s. 3229-3236 8 s.

**The C-terminal priming domain is strongly associated with the main body of bacteriophage phi6 RNA-dependent RNA polymerase**

Sarin, L. P., Wright, S., Chen, Q., Degerth, L. H., Stuart, D. I., Grimes, J. M., Bamford, D. H. & Poranen, M. M., 10 okt. 2012, I: *Virology*. 432, 1, s. 184-193 10 s.

**Incoming influenza A virus evades early host recognition, while influenza B virus induces interferon expression directly upon entry**

Österlund, P., Strengell, M., Sarin, L. P., Poranen, M. M., Fagerlund, R., Melen, K. & Julkunen, I., okt. 2012, I: Journal of Virology. 86, 20, s. 11183-11193 11 s.

**Bacteriophage phi6 nucleocapsid surface protein 8 interacts with virus-specific membrane vesicles containing major envelope protein 9**

Sarin, L. P., Hirvonen, J. J., Laurinmaki, P., Butcher, S. J., Bamford, D. H. & Poranen, M. M., 2012, I: Journal of Virology. 86, 9, s. 5376-5379 4 s.

**Innate Immune Responses in Human Monocyte-Derived Dendritic Cells Are Highly Dependent on the Size and the 5' Phosphorylation of RNA Molecules**

Jiang, M., Osterlund, P., Sarin, L. P., Poranen, M. M., Bamford, D. H., Guo, D. & Julkunen, I., 2011, I: Online Journal of Immunology. 187, 4, s. 1713-1721 9 s.

**The N-Terminus of the RNA Polymerase from Infectious Pancreatic Necrosis Virus Is the Determinant of Genome Attachment**

Graham, S. C., Sarin, L. P., Bahar, M. W., Myers, R. A., Stuart, D. I., Bamford, D. H. & Grimes, J. M., 2011, I: PLoS Pathogens. 7, 6, s. e1002085 11 s.

**Molecular mechanisms of bacteriophage phi6 RNA-dependent RNA polymerase and its utilization in biotechnology**

Sarin, L. P., 2010, Helsinki: University of Helsinki. 62 s.

**Insights into the pre-initiation events of bacteriophage phi6 RNA-dependent RNA polymerase: towards the assembly of a productive binary complex**

Sarin, L. P., Poranen, M. M., Lehti, N. M., Ravantti, J. J., Koivunen, M. R. L., Aalto, A. P., Van Dijk, A. A., Stuart, D. I., Grimes, J. M. & Bamford, D. H., 2009, I: Nucleic Acids Research. 37, 4, s. 1182-1192 11 s.

**Structure-function insights into the RNA-dependent RNA polymerase of the dsRNA bacteriophage 6**

Koivunen, M. R. L., Sarin, L. P. & Bamford, D. H., 2008, *Segmented double-stranded RNA viruses: edited by John T. Patton*. Norfolk, UK: Caister Academic Press, s. 239-257 19 s.

**Large-scale production of dsRNA and siRNA pools for RNA interference utilizing bacteriophage phi6 RNA-dependent RNA polymerase**

Aalto, A., Sarin, L. P., Van Dijk, A. A., Saarma, M., Poranen, M. M., Arumäe, U. & Bamford, D. H., 2007, I: RNA. 13, 3, s. 422-429 8 s.

**Identification of mutations causing temperature-sensitive defects in Semliki forest virus RNA synthesis**

Lulla, V., Merits, A., Sarin, P., Kääriäinen, L., Keränen, S. & Ahola, T., 2006, I: Journal of Virology. 80, 6, s. 3108-3111 4 s.

## !!Projects

### Center of Excellence in Virus Research (CoE\_VIRRES)

Bamford, D. H. (Principal Investigator), Bamford, J. (Deltagare), Butcher, S. (Principal Investigator), Oksanen, H. M. (Principal Investigator), Poranen, M. (Principal Investigator), Roine, E. (Principal Investigator), Kainov, D. (Principal Investigator), Tuma, R. (Deltagare), Ravantti, J. (Deltagare), Huiskonen, J. (Deltagare), Jääliñoja, H. (Deltagare), Ora, A. (Deltagare), Hattula, K. (Deltagare), Ziedaite, G. (Deltagare), Romanovskaya, A. (Deltagare), Lisal, J. (Deltagare), Buivydas, A. (Deltagare), Redder, P. (Deltagare), Domanska, A. (Deltagare), Vilen, S. (Deltagare), Manole, V. (Deltagare), Happonen, L. (Deltagare), Seitsonen, J. (Deltagare), Liljeroos, L. (Deltagare), Suchanova, B. (Deltagare), Falck, S. (Deltagare), Daugelavicius, R. (Deltagare), Golubtsov, A. (Deltagare), Yuan, P. (Deltagare), Anastasina, M. (Deltagare), Karhu, N. J. (Deltagare), Koivunen, M. (Deltagare), Laurinavicius, S. (Deltagare), Wallin, A. (Deltagare), Aalto, A. P. (Deltagare), Sarin, P. (Deltagare), Atanasova, N. (Deltagare), Sun, X. (Deltagare), Pietilä, M. (Deltagare), Krupovic, M. (Deltagare), Cvirkaite-Krupovic, V. (Deltagare), Kukkaro, P. (Deltagare) & Pirttimaa, M. (Deltagare)  
25/02/2011 → 31/12/2016

### ProteRNA: Enhanced Production of Heterologous Proteins Following Translational Fine-Tuning by Optimized Post-Transcriptional RNA Modification

Sarin, P. (Principal Investigator), Qasim, M. S. (Deltagare), Abendroth, U. (Deltagare), Pedor, J. K. (Deltagare), Kalaniemi, S. M. (Deltagare) & Heinonen, M.-M. K. (Deltagare)

01/09/2019 → 31/08/2025

**CHEMODI: Modulation of post-transcriptional transfer RNA modification as an enhancer of chemotherapeutic agents**

Sarin, P. (Projektledare), Gregorova, P. (deltagare), Heinonen, M.-M. K. (deltagare), Nordman, E. M. (deltagare), Gregorova, P. (Deltagare) & Laarne, M. M. (Deltagare)

Sigrid Juséliuksen Säätiö @003701165704@

01/05/2022 → 30/04/2026

**PROMOTE: Post-transcriptional RNA modifications as modulators of translation and infection.**

Sarin, P. (Projektledare), Gregorova, P. (deltagare), Heinonen, M.-M. K. (deltagare), Hodge, Y. (deltagare), Kirkinen, T. A. (deltagare), Mikhailava, N. (deltagare), Nordman, E. M. (deltagare), Radešić, M. (deltagare), Rajaveräjä, A.-E. (deltagare) & Willman, A. (deltagare)

Finlands Akademi

01/09/2023 → 31/08/2027

**TUPA: Solutions for increased societal safety and individual health during pandemics**

Gregorova, P. (Deltagare), Heinonen, M.-M. K. (Deltagare) & Sarin, P. (Principal Investigator)

Business Finland

01/10/2020 → 31/03/2021

**The role of translational misregulation in tumorigenesis**

Sarin, P. (Principal Investigator), Gregorova, P. (Deltagare) & Rayamajhi Thapa, R. (Deltagare)

01/05/2017 → 30/04/2020

**Transfer RNA modifications as modulators of translation.**

Sarin, P. (Principal Investigator), Koh, C. S. (Deltagare), Gregorova, P. (Deltagare), Hotti, H. (Deltagare), Rayamajhi Thapa, R. (Deltagare), Abendroth, U. (Deltagare) & Lampi, M. (Deltagare)

SUOMEN AKATEMIA, Academy of Finland

01/09/2016 → 31/08/2021

**Translational adaptation to directed evolution by post-transcriptional RNA modifications**

Hotti, H. (Projektledare) & Sarin, P. (Principal Investigator)

01/09/2018 → 31/08/2021

**Translation and neoplasia – the multifaceted role of post-transcriptional transfer RNA modification**

Sarin, P. (Projektledare), Gregorova, P. (deltagare), Gregorova, P. (Deltagare), Heinonen, M.-M. K. (Deltagare) & Laarne, M. M. (Deltagare)

Sigrid Juséliuksen Säätiö, Sigrid Juselius Foundation, Sigrid Juséliuksen Säätiö @003701165704@

01/05/2020 → 31/12/2022