

Juha Huiskonen  
Director  
Institute of Biotechnology  
Helsinki Institute of Life Science HiLIFE  
Viikinkaari 5, Biocenter 2  
00014  
Helsinki  
Finland  
Email: juha.huiskonen@helsinki.fi  
Phone: +358503183918  
Phone: +3580294159562  
DoB: 7.6.1977 (Helsinki)



## Curriculum vitae

### Positions of trust at external institutions

Board Member, Biocenter Finland

Member of Advisory Committee, worldwide Protein Data Bank (wwPDB)

Member of the Scientific Advisory Committee, Molecular and Cellular Structure cluster, EMBL-EBI

### Positions of trust at the University of Helsinki

Viikki Campus Cooperation Committee, deputy member

Member of HiLIFE management team

Member of Thriving Nature (PROFI5) steering group

Member of UHBRAIN (PROFI6) steering group

## Qualifications

Title of Associate Professor, University of Oxford  
Award Date: 26 Mar 2015

Title of Docent in Molecular Virology, University of Helsinki  
Award Date: 13 May 2014

Title of University Research Lecturer, University of Oxford  
Award Date: 1 Jan 2014

Genetics, Doctor of Philosophy (PhD), University of Helsinki  
Award Date: 25 Jan 2006

Genetics, Master of Science (MSc), University of Helsinki  
Award Date: 23 Feb 2001

## Employment

### Director

Institute of Biotechnology  
University of Helsinki  
Helsinki, Finland  
1 Sept 2020 → present

### Professor

Molecular and Integrative Biosciences Research Programme  
University of Helsinki  
Finland  
1 Jun 2021 → present

### **Honorary Visiting Research Fellow**

University of Oxford  
United Kingdom  
1 Apr 2020 → present

### **Principal Investigator**

University of Oxford  
Oxford, United Kingdom  
1 Jan 2015 → 31 Mar 2020

### **Academy of Finland Research Fellow**

University of Oxford  
Oxford, United Kingdom  
1 Jan 2010 → 31 Dec 2014

## **Research outputs**

### **Community recommendations on cryoEM data archiving and validation**

Kleywegt, G. J., Adams, P. D., Butcher, S. J., Lawson, C., Rohou, A., Rosenthal, P. B., Subramaniam, S., Topf, M., Abbott, S., Baldwin, P. R., Berrisford, J. M., Bricogne, G., Choudhary, P., Croll, T. I., Danev, R., Ganesan, S. J., Grant, T., Gutmanas, A., Henderson, R., Heymann, J. B., & 27 othersHuiskonen, J. T., Istrate, A., Kato, T., Lander, G. C., Lok, S-M., Ludtke, S. J., Murshudov, G. N., Pye, R., Pintilie, G. D., Richardson, J. S., Sachse, C., Salih, O., Scheres, S. H. W., Schroeder, G. F., Sorzano, C. O. S., Stagg, S. M., Wang, Z., Warshamanage, R., Westbrook, J. D., Winn, M. D., Young, J. Y., Burley, S. K., Hoch, J. C., Kurisu, G., Morris, K., Patwardhan, A. & Velankar, S., 6 Feb 2024, (Accepted/In press) International Union of Crystallography.

### **Nanobody engineering for SARS-CoV-2 neutralization and detection**

Hannula, L., Kuivanen, S., Lasham, J., Kant, R., Kareinen, L., Bogacheva, M., Strandin, T., Sironen, T., Hepojoki, J., Sharma, V., Saviranta, P., Kipar, A., Vapalahti, O., Huiskonen, J. T. & Rissanen, I., Feb 2024, In: Microbiology Spectrum. 12, 4, 18 p.

### **Structure and interactions of the endogenous human Commander complex**

Laulumaa, S., Kumpula, E. P., Huiskonen, J. T. & Varjosalo, M., 2024, (E-pub ahead of print) In: Nature Structural and Molecular Biology.

### **Molecular view of ER membrane remodeling by the Sec61/TRAP translocon**

Karki, S., Javanainen, M., Rehan, S., Tranter, D., Kellosoalo, J., Huiskonen, J., Happonen, L. J. & Paavilainen, V., 20 Nov 2023, In: EMBO Reports. 24, 16 p., e57910.

### **DNA-origami-directed virus capsid polymorphism**

Seitz, I., Saarinen, S., Kumpula, E. P., McNeale, D., Anaya-Plaza, E., Lampinen, V., Hytönen, V. P., Sainsbury, F., Cornelissen, J. J. L. M., Linko, V., Huiskonen, J. T. & Kostianen, M. A., Oct 2023, In: Nature Nanotechnology. 18, 10, p. 1205–1212

### **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., & 4 othersHietakangas, V., Picotti, P., Barral, Y. & Saarikangas, J., 21 Sept 2023, In: Molecular Cell. 83, 18, p. 3360-3376

### **Intranasal trimeric sherpabody inhibits SARS-CoV-2 including recent immunoevasive Omicron subvariants**

Mäkelä, A. R., Ugurlu, H., Hannula, L., Kant, R., Salminen, P., Fagerlund, R., Mäki, S., Haveri, A., Strandin, T., Kareinen, L., Hepojoki, J., Kuivanen, S., Levanov, L., Pasternack, A., Naves, R. A., Ritvos, O., Österlund, P., Sironen, T., Vapalahti, O., Kipar, A., & 3 othersHuiskonen, J. T., Rissanen, I. & Saksela, K., 24 Mar 2023, In: Nature Communications. 14, 1, 12 p., 1637.

### **MANF regulates neuronal survival and UPR through its ER-located receptor IRE1 $\alpha$**

Kovaleva, V., Yu, L.-Y., Ivanova, L., Shpironok, O., Nam, J., Eesmaa, A., Kumpula, E.-P., Sakson, S., Toots, U., Ustav, M., Huiskonen, J. T., Voutilainen, M. H., Lindholm, P., Karelson, M. & Saarma, M., 28 Feb 2023, In: *Cell Reports*. 42, 2, 31 p., 112066.

### **Structural basis underlying specific biochemical activities of non-muscle tropomyosin isoforms**

Selvaraj, M., Kokate, S. B., Reggiano, G., Kogan, K., Kotila, T., Kremneva, E., DiMaio, F., Lappalainen, P. & Huiskonen, J. T., 31 Jan 2023, In: *Cell Reports*. 42, 1, 15 p., 111900.

### **Proteiinien 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., & 4 others Hietakangas, V., Picotti, P., Barral, Y. & Saarikangas, J., 2023, In: *Duodecim*. 139, 19, p. 1575 1 p.

### **Signal peptide mimicry primes Sec61 for client-selective inhibition**

Rehan, S., Tranter, D., Sharp, P. P. P., Craven, G. B. B., Lowe, E., Anderl, J. L. L., Muchamuel, T., Abrishami, V., Kuivanen, S., Wenzell, N. A. A., Jennings, A., Kalyanaraman, C., Strandin, T., Javanainen, M., Vapalahti, O., Jacobson, M. P. P., McMinn, D., Kirk, C. J., Huiskonen, J. T., Taunton, J., & 1 others Paavilainen, V. O., 2023, In: *Nature Chemical Biology*. 19, p. 1054–1062 27 p.

### **Cryo-EM structure of ssDNA bacteriophage $\Phi$ CJ23 provides insight into early virus evolution**

Kejzar, N., Laanto, E., Rissanen, I., Abrishami, V., Selvaraj, M., Moineau, S., Ravantti, J., Sundberg, L. R. & Huiskonen, J. T., Dec 2022, In: *Nature Communications*. 13, 7478.

### **Mechanistic Insights into the Activation of Lecithin-Cholesterol Acyltransferase in Therapeutic Nanodiscs Composed of Apolipoprotein A-I Mimetic Peptides and Phospholipids**

Giorgi, L., Niemelä, A., Kumpula, E.-P., Natri, O., Parkkila, P., Huiskonen, J. T. & Koivuniemi, A., 7 Nov 2022, In: *Molecular Pharmaceutics*. 19, 11, p. 4135-4148 14 p.

### **Structural basis of rapid actin dynamics in the evolutionarily divergent *Leishmania* parasite**

Kotila, T., Wioland, H., Selvaraj, M., Kogan, K., Antenucci, L., Jegou, A., Huiskonen, J. T., Romet-Lemonne, G. & Lappalainen, P., 15 Jun 2022, In: *Nature Communications*. 13, 1, 18 p., 3442.

### **Snapshots of actin and tubulin folding inside the TRiC chaperonin**

Kelly, J. J., Tranter, D., Pardon, E., Chi, G., Kramer, H., Happonen, L., Knee, K. M., Janz, J. M., Steyaert, J., Bulawa, C., Paavilainen, V. O., Huiskonen, J. T. & Yue, W. W., May 2022, In: *Nature Structural and Molecular Biology*. 29, p. 420–429 24 p.

### **Structure of a Cell Entry Defective Human Adenovirus Provides Insights into Precursor Proteins and Capsid Maturation: Cryo-EM structure of ts1 virion of an adenovirus**

Yu, X., Mullen, T. M., Abrishami, V., Huiskonen, J. T., Nemerow, G. R. & Reddy, V. S., 30 Jan 2022, In: *Journal of Molecular Biology*. 434, 2, 13 p., 167350.

### **Localized reconstruction in Scipion expedites the analysis of symmetry mismatches in cryo-EM data**

Abrishami, V., Ilca, S. L., Gómez-Blanco, J., Rissanen, I., de la Rosa-Trevín, J. M., Reddy, V. S., Carazo, J. M. & Huiskonen, J. T., Mar 2021, In: *Progress in Biophysics & Molecular Biology*. 160, p. 43-52 10 p.

### **Structural Basis for a Neutralizing Antibody Response Elicited by a Recombinant Hantaan Virus Gn Immunogen**

Rissanen, I., Krumm, S. A., Stass, R., Whitaker, A., Voss, J. E., Bruce, E. A., Rothenberger, S., Kunz, S., Burton, D. R., Huiskonen, J. T., Botten, J. W., Bowden, T. A. & Doores, K. J., 2021, In: *mBio*. 12, 4, 15 p., 02531.

### **Molecular rationale for antibody-mediated targeting of the hantavirus fusion glycoprotein**

Rissanen, I., Stass, R., Krumm, S. A., Seow, J., Hulswit, R. J. G., Paesen, G. C., Hepojoki, J., Vapalahti, O., Lundkvist, Å., Reynard, O., Volchkov, V., Doores, K. J., Huiskonen, J. T. & Bowden, T. A., 22 Dec 2020, In: *eLife*. 9, 23 p., 58242.

### **The Hantavirus Surface Glycoprotein Lattice and Its Fusion Control Mechanism**

Serris, A., Stass, R., Bignon, E. A., Muena, N. A., Manuguerra, J.-C., Jangra, R. K., Li, S., Chandran, K., Tischler, N. D., Huiskonen, J. T., Rey, F. A. & Guardado-Calvo, P., 15 Oct 2020, In: *Cell*. 183, 2, p. 442-456e16 31 p.

Assessment of Immunogenicity and Efficacy of a Zika Vaccine Using Modified Vaccinia Ankara Virus as Carriers.

López-Camacho, C., Kim, Y. C., Abbink, P., Larocca, R. A., Huiskonen, J. T., Barouch, D. H. & Reyes-Sandoval, A., 2 Nov 2019, In: *Pathogens*. 8, 4, 11 p., E216.

The structural basis of lipid scrambling and inactivation in the endoplasmic reticulum scramblase TMEM16K

Bushell, S. R., Pike, A. C. W., Falzone, M. E., Rorsman, N. J. G., Ta, C. M., Corey, R. A., Newport, T. D., Christianson, J. C., Scofano, L. F., Shintre, C. A., Tessitore, A., Chu, A., Wang, Q., Shrestha, L., Mukhopadhyay, S. M. M., Love, J. D., Burgess-Brown, N. A., Sitsapesan, R., Stansfeld, P. J., Huiskonen, J. T., & 3 others Tammaro, P., Accardi, A. & Carpenter, E. P., 2 Sept 2019, In: *Nature Communications*. 10, 16 p., 3956.

### **Structures of enveloped virions determined by cryogenic electron microscopy and tomography: Advances in Virus Research**

Stass, R., Ng, W. M., Kim, Y. C. & Huiskonen, J. T., 1 Aug 2019, *Complementary Strategies to Study Virus Structure and Function*. Rey, F. A. (ed.). Academic Press, Vol. 105. p. 35-71 37 p. (Advances in Virus Research).

### **Multiple liquid crystalline geometries of highly compacted nucleic acid in a dsRNA virus**

Ilca, S., Sun, X., El Omari, K., Kotecha, A., Haas, F. D., DiMaio, F., Grimes, J. M., Stuart, D. I., Poranen, M. M. & Huiskonen, J. T., 13 Jun 2019, In: *Nature*. 570, p. 252-+

Assessment of Immunogenicity and Neutralisation Efficacy of Viral-Vectored Vaccines Against Chikungunya Virus

Lopez-Camacho, C., Kim, Y. C., Blight, J., Moreli, M. L., Montoya-Diaz, E., Huiskonen, J. T., Kuehmerer, B. M. & Reyes-Sandoval, A., Apr 2019, In: *Viruses (Basel)*. 11, 4, 17 p., 322.

### **Assembly of complex viruses exemplified by a halophilic euryarchaeal virus**

De Colibus, L., Roine, E., Walter, T. S., Ilca, S. L., Wang, X., Wang, N., Roseman, A. M., Bamford, D., Huiskonen, J. T. & Stuart, D., 29 Mar 2019, In: *Nature Communications*. 10, 9 p., 1456.

### **The structure of a prokaryotic viral envelope protein expands the landscape of membrane fusion proteins**

El Omari, K., Li, S., Kotecha, A., Walter, T. S., Bignon, E., Harlos, K., Somerharju, P., Haas, F. D., Clare, D., Molin, M., Hurtado, F., Li, M., Grimes, J. M., Bamford, D. H., Tischler, N. D., Huiskonen, J. T., Stuart, D. I. & Roine, E., 19 Feb 2019, In: *Nature Communications*. 10, 11 p., 846.

Understanding the structure and role of DNA-PK in NHEJ: How X-ray diffraction and cryo-EM contribute in complementary ways.

Wu, Q., Liang, S., Ochi, T., Chirgadze, D. Y., Huiskonen, J. T. & Blundell, T. L., 20 Jan 2019, (E-pub ahead of print) In: *Progress in Biophysics & Molecular Biology*.

A Protective Monoclonal Antibody Targets a Site of Vulnerability on the Surface of Rift Valley Fever Virus

Allen, E. R., Krumm, S. A., Raghvani, J., Halldorsson, S., Elliott, A., Graham, V. A., Koudriakova, E., Harlos, K., Wright, D., Warimwe, G. M., Brennan, B., Huiskonen, J. T., Dowall, S. D., Elliott, R. M., Pybus, O. G., Burton, D. R., Hewson, R., Doores, K. J. & Bowden, T. A., 26 Dec 2018, In: *Cell Reports*. 25, 13, p. 3750-+ 13 p.

Characterization of a potent and highly unusual minimally enhancing antibody directed against dengue virus

Renner, M., Flanagan, A., Dejnirattisai, W., Puttikhunt, C., Kasinrerk, W., Supasa, P., Wongwiwat, W., Chawansuntati, K., Duangchinda, T., Cowper, A., Midgley, C. M., Malasit, P., Huiskonen, J. T., Mongkolsapaya, J., Screaton, G. R. & Grimes, J. M., Nov 2018, In: *Nature immunology*. 19, 11, p. 1248-+ 13 p.

### **Beyond structures of highly symmetric purified viral capsids by cryo-EM**

Stass, R., Ilca, S. L. & Huiskonen, J. T., Oct 2018, In: *Current Opinion in Structural Biology*. 52, p. 25-31 7 p.

**Structure of the Lassa virus glycan shield provides a model for immunological resistance**

Watanabe, Y., Raghvani, J., Allen, J. D., Seabright, G. E., Li, S., Moser, F., Huiskonen, J. T., Strecker, T., Bowden, T. A. & Crispin, M., 10 Jul 2018, In: Proceedings of the National Academy of Sciences of the United States of America. 115, 28, p. 7320-7325 6 p.

**Mycobacterium tuberculosis CarD, an essential global transcriptional regulator forms amyloid-like fibrils**

Kaur, G., Kaundal, S., Kapoor, S., Grimes, J. M., Huiskonen, J. T. & Thakur, K. G., 4 Jul 2018, In: Scientific Reports. 8, 13 p., 10124.

**Image processing for cryogenic transmission electron microscopy of symmetry-mismatched complexes**

Huiskonen, J. T., 27 Apr 2018, In: Bioscience Reports. 38, 2, 13 p., 20170203.

**Towards in cellulose virus crystallography**

Duyvesteyn, H. M. E., Ginn, H. M., Pietila, M. K., Wagner, A., Hattne, J., Grimes, J. M., Hirvonen, E., Evans, G., Parsy, M-L., Sauter, N. K., Brewster, A. S., Huiskonen, J. T., Stuart, D. I., Sutton, G. & Bamford, D. H., 28 Feb 2018, In: Scientific Reports. 8, 7 p., 3771.

**Shielding and activation of a viral membrane fusion protein**

Halldorsson, S., Li, S., Li, M., Harlos, K., Bowden, T. A. & Huiskonen, J. T., 24 Jan 2018, In: Nature Communications. 9, 1, 9 p., 349.

**Dual Role of a Viral Polymerase in Viral Genome Replication and Particle Self-Assembly**

Sun, X., Ilca, S. L., Huiskonen, J. T. & Poranen, M. M., 2018, In: mBio. 9, 5, 14 p., ARTN e01242-18.

**Unique architecture of thermophilic archaeal virus APBV1 and its genome packaging**

Ptchelkine, D., Gillum, A., Mochizuki, T., Lucas-Staat, S., Liu, Y., Krupovic, M., Phillips, S. E. V., Prangishvili, D. & Huiskonen, J. T., 10 Nov 2017, In: Nature Communications. 8, 6 p., 1436.

**Structural Transitions of the Conserved and Metastable Hantaviral Glycoprotein Envelope**

Rissanen, I., Stass, R., Zeltina, A., Li, S., Hepojoki, J., Harlos, K., Gilbert, R. J. C., Huiskonen, J. T. & Bowden, T. A., Nov 2017, In: Journal of Virology. 91, 21, 11 p., UNSP e00378-17.

**Structures of foot and mouth disease virus pentamers: Insight into capsid dissociation and unexpected pentamer reassociation**

Malik, N., Kotecha, A., Gold, S., Asfor, A., Ren, J., Huiskonen, J. T., Tuthill, T. J., Fry, E. E. & Stuart, D. I., Sept 2017, In: PLoS Pathogens. 13, 9, 14 p., 1006607.

**Virus found in a boreal lake links ssDNA and dsDNA viruses**

Laanto, E., Mantynen, S., De Colibus, L., Marjakangas, J., Gillum, A., Stuart, D. I., Ravantti, J. J., Huiskonen, J. T. & Sundberg, L-R., 1 Aug 2017, In: Proceedings of the National Academy of Sciences of the United States of America. 114, 31, p. 8378-8383 6 p.

**Building bridges between cellular and molecular structural biology**

Patwardhan, A., Brandt, R., Butcher, S. J., Collinson, L., Gault, D., Grunewald, K., Hecksel, C., Huiskonen, J. T., Iudin, A., Jones, M. L., Korir, P. K., Koster, A. J., Lagerstedt, I., Lawson, C. L., Mastrorarde, D., McCormick, M., Parkinson, H., Rosenthal, P. B., Saalfeld, S., Saibil, H. R., & 7 others Sarntivijai, S., Valero, I. S., Subramaniam, S., Swedlow, J. R., Tudose, I., Winn, M. & Kleywegt, G. J., 6 Jul 2017, In: eLife. 6, 11 p., 25835.

**Rules of engagement between alpha v beta 6 integrin and foot-and-mouth disease virus**

Kotecha, A., Wang, Q., Dong, X., Ilca, S. L., Ondiviela, M., Zihe, R., Seago, J., Charleston, B., Fry, E. E., Abrescia, N. G. A., Springer, T. A., Huiskonen, J. T. & Stuart, D. I., 23 May 2017, In: Nature Communications. 8, 8 p., 15408.

**Near-atomic structure of Japanese encephalitis virus reveals critical determinants of virulence and stability**

Wang, X., Li, S-H., Zhu, L., Nian, Q-G., Yuan, S., Gao, Q., Hu, Z., Ye, Q., Li, X-F., Xie, D-Y., Shaw, N., Wang, J., Walter, T. S., Huiskonen, J. T., Fry, E. E., Qin, C-F., Stuart, D. I. & Rao, Z., 26 Apr 2017, In: Nature Communications. 8, 9 p., 14.

### **Double-stranded RNA virus outer shell assembly by bona fide domain-swapping**

Sun, Z., El Omari, K., Sun, X., Ilca, S., Kotecha, A., Stuart, D., Poranen, M. M. & Huiskonen, J. T., Mar 2017, In: Nature Communications. 8, p. 14814

### **Molecular insights into lipid-assisted Ca<sup>2+</sup> regulation of the TRP channel Polycystin-2**

Wilkes, M., Madej, M. G., Kreuter, L., Rhinow, D., Heinz, V., De Sanctis, S., Ruppel, S., Richter, R. M., Joos, F., Grieben, M., Pike, A. C. W., Huiskonen, J. T., Carpenter, E. P., Kuhlbrandt, W., Witzgall, R. & Ziegler, C., Feb 2017, In: Nature Structural and Molecular Biology. 24, 2, p. 123-+ 10 p.

### **Structure of the polycystic kidney disease TRP channel Polycystin-2 (PC2)**

Grieben, M., Pike, A. C. W., Shintre, C. A., Venturi, E., El-Ajouz, S., Tessitore, A., Shrestha, L., Mukhopadhyay, S., Mahajan, P., Chalk, R., Burgess-Brown, N. A., Sitsapesan, R., Huiskonen, J. T. & Carpenter, E. P., Feb 2017, In: Nature Structural and Molecular Biology. 24, 2, p. 114-+ 12 p.

### **Structure of a phleboviral envelope glycoprotein reveals a consolidated model of membrane fusion**

Halldorsson, S., Behrens, A.-J., Harlos, K., Huiskonen, J. T., Elliott, R. M., Crispin, M., Brennan, B. & Bowden, T. A., 28 Jun 2016, In: Proceedings of the National Academy of Sciences of the United States of America. 113, 26, p. 7154-7159 6 p.

### **Editorial overview: Virus structure and assembly: Virions - from structure and physics to design principles**

Zlotnick, A. & Huiskonen, J. T., Jun 2016, In: Current opinion in virology. 18, p. VII-VIII 2 p.

### **A Molecular-Level Account of the Antigenic Hantaviral Surface**

Li, S., Rissanen, I., Zeltina, A., Hepojoki, J., Raghwani, J., Harlos, K., Pybus, O. G., Huiskonen, J. T. & Bowden, T. A., 3 May 2016, In: Cell Reports. 15, 5, p. 959-967 9 p.

### **Low pH and Anionic Lipid-dependent Fusion of Uukuniemi Phlebovirus to Liposomes**

Bitto, D., Halldorsson, S., Caputo, A. & Huiskonen, J. T., 18 Mar 2016, In: Journal of Biological Chemistry. 291, 12, p. 6412-6422 11 p.

### **Nucleocapsid assembly in pneumoviruses is regulated by conformational switching of the N protein**

Renner, M., Bertinelli, M., Leyrat, C., Paesen, G. C., de Oliveira, L. F. S., Huiskonen, J. T. & Grimes, J. M., 15 Feb 2016, In: eLife. 5, 12 p., 12627.

### **Acidic pH-Induced Conformations and LAMP1 Binding of the Lassa Virus Glycoprotein Spike**

Li, S., Sun, Z., Pryce, R., Parsy, M.-L., Fehling, S. K., Schlie, K., Siebert, C. A., Garten, W., Bowden, T. A., Strecker, T. & Huiskonen, J. T., Feb 2016, In: PLoS Pathogens. 12, 2, 18 p., 1005418.

### **Localized reconstruction of subunits from electron cryomicroscopy images of macromolecular complexes**

Ilca, S. L., Kotecha, A., Sun, X., Poranen, M. M., Stuart, D. I. & Huiskonen, J. T., 4 Nov 2015, In: Nature Communications. 6, 8 p., 8843.

### **Structure-based energetics of protein interfaces guides foot-and-mouth disease virus vaccine design**

Kotecha, A., Seago, J., Scott, K., Burman, A., Loureiro, S., Ren, J., Porta, C., Ginn, H. M., Jackson, T., Perez-Martin, E., Siebert, C. A., Paul, G., Huiskonen, J. T., Jones, I. M., Esnouf, R. M., Fry, E. E., Maree, F. F., Charleston, B. & Stuart, D. I., Oct 2015, In: Nature Structural and Molecular Biology. 22, 10, p. 788-794 7 p.

### **Structure of the bacteriophage phi6 nucleocapsid solved to 3.9 angstrom resolution using electron cryomicroscopy**

Sun, Z., Sun, X., Ilca, S., De Colibus, L., Stuart, D. I., Poranen, M. M. & Huiskonen, J. T., Jul 2015, In: The FEBS Journal. 282, S1, p. 51-52 2 p.

### **Determination of N-linked Glycosylation in Viral Glycoproteins by Negative Ion Mass Spectrometry and Ion Mobility**

Bitto, D., Harvey, D. J., Halldorsson, S., Doores, K. J., Pritchard, L. K., Huiskonen, J. T., Bowden, T. A. & Crispin, M., 2015, In: Methods in molecular biology. 1331, p. 93-121 29 p.

Averaging of Viral Envelope Glycoprotein Spikes from Electron Cryotomography Reconstructions using Jsubtomo  
Huiskonen, J. T., Parsy, M-L., Li, S., Bitto, D., Renner, M. & Bowden, T. A., Oct 2014, In: Journal of Visualized Experiments. 92, 11 p., 51714.

Uukuniemi Phlebovirus Assembly and Secretion Leave a Functional Imprint on the Virion Glycome  
Crispin, M., Harvey, D. J., Bitto, D., Halldorsson, S., Bonomelli, C., Edgeworth, M., Scrivens, J. H., Huiskonen, J. T. & Bowden, T. A., Sept 2014, In: Journal of Virology. 88, 17, p. 10244-10251 8 p.

Drastic changes in conformational dynamics of the antiterminator M2-1 regulate transcription efficiency in Pneumovirinae  
Leyrat, C., Renner, M., Harlos, K., Huiskonen, J. T. & Grimes, J. M., 19 May 2014, In: eLife. 3, 43 p., 02674.

Structural Plasticity of the Semliki Forest Virus Glycome upon Interspecies Transmission  
Crispin, M., Harvey, D. J., Bitto, D., Bonomelli, C., Edgeworth, M., Scrivens, J. H., Huiskonen, J. T. & Bowden, T. A., Mar 2014, In: Journal of Proteome Research. 13, 3, p. 1702-1712 11 p.

Structure and Self-Assembly of the Calcium Binding Matrix Protein of Human Metapneumovirus  
Leyrat, C., Renner, M., Harlos, K., Huiskonen, J. T. & Grimes, J. M., 7 Jan 2014, In: Structure. 22, 1, p. 136-148 13 p.

Crystal Structure of Venezuelan Hemorrhagic Fever Virus Fusion Glycoprotein Reveals a Class 1 Postfusion Architecture with Extensive Glycosylation  
Parsy, M-L., Harlos, K., Huiskonen, J. T. & Bowden, T. A., Dec 2013, In: Journal of Virology. 87, 23, p. 13070-13075 6 p.

Isolation and characterization of the positive-sense replicative intermediate of a negative-strand RNA virus  
York, A., Hengrung, N., Vreede, F. T., Huiskonen, J. T. & Fodor, E., 5 Nov 2013, In: Proceedings of the National Academy of Sciences of the United States of America. 110, 45, p. E4238-E4245 8 p.

The Structure of Herpesvirus Fusion Glycoprotein B-Bilayer Complex Reveals the Protein-Membrane and Lateral Protein-Protein Interaction  
Maurer, U. E., Zeev-Ben-Mordehai, T., Pandurangan, A. P., Cairns, T. M., Hannah, B. P., Whitbeck, J. C., Eisenberg, R. J., Cohen, G. H., Topf, M., Huiskonen, J. T. & Gruenewald, K., 6 Aug 2013, In: Structure. 21, 8, p. 1396-1405 10 p.

Orthobunyavirus Ultrastructure and the Curious Tripodal Glycoprotein Spike  
Bowden, T. A., Bitto, D., McLees, A., Yeromonahos, C., Elliott, R. M. & Huiskonen, J. T., May 2013, In: PLoS Pathogens. 9, 5, 10 p., 1003374.

### **Snapshot of virus evolution in hypersaline environments from the characterization of a membrane-containing Salisaeta icosahedral phage 1**

Aalto, A. P., Bitto, D., Ravantti, J., Bamford, D., Huiskonen, J. T. & Oksanen, H., 2012, In: Proceedings of the National Academy of Sciences of the United States of America. 109, 18, p. 7079-7084 6 p.

### **Cryo Electron Tomography of Herpes Simplex Virus during Axonal Transport and Secondary Envelopment in Primary Neurons**

Ibiricu, I., Huiskonen, J. T., Doehner, K., Bradke, F., Sodeik, B. & Gruenewald, K., Dec 2011, In: PLoS Pathogens. 7, 12, 11 p., 1002406.

### **Eisosome proteins assemble into a membrane scaffold**

Karotki, L., Huiskonen, J. T., Stefan, C. J., Ziolkowska, N. E., Roth, R., Surma, M. A., Krogan, N. J., Emr, S. D., Heuser, J., Gruenewald, K. & Walther, T. C., 28 Nov 2011, In: Journal of Cell Biology. 195, 5, p. 889-902 14 p.

### **Eisosome-driven plasma membrane organization is mediated by BAR domains**

Ziolkowska, N. E., Karotki, L., Rehman, M., Huiskonen, J. T. & Walther, T. C., Jul 2011, In: Nature Structural and Molecular Biology. 18, 7, p. 854-856 3 p.

**Electron cryotomography of measles virus reveals how matrix protein coats the ribonucleocapsid within intact virions**  
Liljeroos, L., Huiskonen, J. T., Ora, A., Susi, P. & Butcher, S. J., 2011, In: Proceedings of the National Academy of Sciences of the United States of America. 108, 44, p. 18085-18090 6 p.

**Electron Cryotomography of Tula Hantavirus Suggests a Unique Assembly Paradigm for Enveloped Viruses**  
Huiskonen, J. T., Hepojoki, J., Laurinmaki, P., Vaheri, A., Lankinen, H., Butcher, S. J. & Grunewald, K., 2010, In: Journal of Virology. 84, 10, p. 4889-4897 9 p.

**Efficient production of Rift Valley fever virus-like particles: the antiviral protein MxA can inhibit primary transcription of bunyaviruses**  
Habjan, M., Penski, N., Wagner, V., Spiegel, M., Överby, A. K., Kochs, G., Huiskonen, J. T. & Weber, F., 2009, In: Virology. 385, p. 400-408 9 p.

**Electron cryo-microscopy and single-particle averaging of Rift Valley fever virus: evidence for G<sub>N</sub>-G<sub>C</sub> glycoprotein heterodimers**  
Huiskonen, J. T., Överby, A. K., Weber, F. & Grunewald, K., 2009, In: Journal of Virology. 83, 18, p. 3762-3769 8 p.

**Insights into bunyavirus architecture from electron cryotomography of Uukuniemi virus**  
Överby, A. K., Pettersson, R. F., Grunewald, K. & Huiskonen, J. T., 2008, In: Proceedings of the National Academy of Sciences of the United States of America. 105, 7, p. 2375-2379 5 p.

**Electron cryomicroscopy comparison of the architectures of the enveloped bacteriophages [phi]6 and [phi]8**  
Jääliñoja, H. T., Huiskonen, J. T. & Butcher, S. J., 2007, In: Structure. 15, p. 157-167 11 p.

**Membrane-containing viruses with icosahedrally symmetric capsids**  
Huiskonen, J. T. & Butcher, S. J., 2007, In: Current Opinion in Structural Biology. 17, p. 229-236 8 p.

**Structure of a hexameric RNA packaging motor in a viral polymerase complex**  
Huiskonen, J. T., Jääliñoja, H. T., Briggs, J. A. G., Fuller, S. D. & Butcher, S. J., 2007, In: Journal of Structural Biology. 158, p. 156-164 9 p.

**Tale of two spikes in bacteriophage PRD1**  
Huiskonen, J. T., Manole, V. & Butcher, S. J., 2007, In: Proceedings of the National Academy of Sciences of the United States of America. 104, 16, p. 6666-6671 6 p.

**Structure of the bacteriophage phi6 nucleocapsid suggests a mechanism for sequential RNA packaging**  
Huiskonen, J. T., Haas, F. D., Bubeck, D., Bamford, D. H., Fuller, S. D. & Butcher, S. J., 2006, In: Structure. 14, p. 1039-1048 10 p.

**Classification and three-dimensional reconstruction of unevenly distributed or symmetry mismatched features of icosahedral particles**  
Briggs, J. A. G., Huiskonen, J. T., Fernando, K. V., Gilbert, R. J. C., Scotti, P., Butcher, S. J. & Fuller, S. D., 2005, In: Journal of Structural Biology. 150, p. 332-339 8 p.

**Membrane proteins modulate the bilayer curvature in the bacterial virus Bam35**  
Laurinmäki, P. A., Huiskonen, J. T., Bamford, D. H. & Butcher, S. J., 2005, In: Structure. 13, 12, p. 1819-1828 10 p.

**Structure and assembly of membrane-containing dsDNA bacteriophages**  
Huiskonen, J. T., 2005, Helsinki: University of Helsinki, Institute of Biotechnology etc. 59 p.

**The structure of the bacteriophage PRD1 spike sheds light on the evolution of viral capsid architecture**  
Merckel, M. C., Huiskonen, J. T., Bamford, D. H., Goldman, A. & Tuma, R., 2005, In: Molecular Cell. 18, 2, p. 161-170 10 p.



**The PM2 virion has a novel organization with an internal membrane and pentameric receptor binding spikes**

Huiskonen, J. T., Kivelä, H. M., Bamford, D. H. & Butcher, S. J., 2004, In: Nature Structural and Molecular Biology. 11, p. 850-856 7 p.

**Probing the ability of the coat and vertex protein of the membrane-containing bacteriophage PRD1 to display a meningococcal epitope**

Huiskonen, J. T., Laakkonen, L., Toropainen, M., Sarvas, M., Bamford, D. H. & Bamford, J. K. H., 2003, In: Virology. 310, 2, p. 267-279 13 p.

**Minor proteins, mobile arms and membrane-capsid interactions in the bacteriophage PRD1 capsid**

San Martin, C., Huiskonen, J. T., Bamford, J. K. H., Butcher, S. J., Fuller, S. D., Bamford, D. H. & Burnett, R. M., 2002, In: Nature Structural and Molecular Biology. 9, 10, p. 756-763 8 p.

## Activities

**Towards structures of endogenous complexes by cryo-EM**

Juha Huiskonen (Keynote speaker)  
17 Oct 2021

**Towards Cryo-EM Structures of Endogenous Complexes**

Juha Huiskonen (Speaker)  
22 Jan 2020

**Advances of Cryo-EM in Understanding Macromolecular Structure and Function**

Juha Huiskonen (Speaker)  
29 Nov 2019

**Exploring the glycoprotein surface of bunyaviruses**

Juha Huiskonen (Keynote speaker)  
1 Oct 2019

**HiLIFE Symposium: Exploring Cellular Complexity by Cryo-EM**

Juha Huiskonen (Chair)  
28 Feb 2019

**Activation of a viral membrane fusion protein**

Juha Huiskonen (Invited speaker)  
11 Dec 2018

**Viral dsRNA genome organisation revealed by cryoEM**

Juha Huiskonen (Invited speaker)  
11 Dec 2018

**Shielding and Activation of a Viral Membrane Fusion Protein**

Juha Huiskonen (Invited speaker)  
25 Jun 2018

**EMBO Workshop Membrane Fusion in Health and Disease**

Juha Huiskonen (Scientific Committee Member)  
24 Jun 2018

**Shielding and activation of viral membrane fusion proteins**

Juha Huiskonen (Invited speaker)

27 Feb 2018

### **Shielding and Activation of a Viral Membrane Fusion Protein**

Juha Huiskonen (Invited speaker)

19 Feb 2018

### **Insight into viral class II membrane fusion activation by a combined structural biology approach**

Juha Huiskonen (Invited speaker)

20 Nov 2017

### **Insight into Rift Valley fever virus membrane fusion activation by a combined structural biology approach**

Juha Huiskonen (Invited speaker)

8 Sept 2017

### **Cryo-EM Structure of the TRP channel PC2 involved in Polycystic Kidney Disease**

Juha Huiskonen (Keynote speaker)

7 Jun 2017

### **Current opinion in virology (Journal)**

Juha Huiskonen (Editor) & Adam Zlotnick (Editor)

Jun 2016

## **Projects**

### **A plasmid goes viral: Understanding the origin and evolution of viruses by studying a newly discovered virus-like element**

Huiskonen, J., Castro, B., Eshriew, E. K., Jayachandran, R. B. & Song, X.

VolkswagenStiftung

01/01/2021 → 31/12/2023

### **EndoGap: Architecture of Endogenous Gap Junctions**

Huiskonen, J. & Eshriew, E. K.

Sigrid Juseliuksen Säätiö

01/05/2019 → 31/12/2023

### **BIZEB: Bio-Imaging of Zoonotic and Emerging Bunyaviruses**

Huiskonen, J.

European Commission / Horizon 2020

01/04/2015 → 31/03/2020

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

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

25/02/2011 → 31/12/2016

### **ResponseHD: Chaperonin response to protein misfolding in neurodegenerative disease**

Huiskonen, J., Castro, B., Ghanem, M. & Kumpula, E. T.

Academy of Finland

01/09/2022 → 31/08/2026

### **ConnexinCode: Cracking the Connexin code – rules of engagement between Gap junction forming proteins**

Huiskonen, J. & Eshriew, E. K.

Sigrid Juseliuksen Säätiö

01/05/2022 → 30/04/2025

**iCoin: Inhibitors of SARS-CoV-2 infection**

Huiskonen, J., Castro, B., Hannula, L., Kant, R., Kumpula, E. T. & Rissanen, I.  
SUOMEN AKATEMIA Vähäkylä Leena  
01/01/2020 → 31/12/2022

**Mechanism of antagonist**

Huiskonen, J. & Castro, B.  
Syöpäsäätiö sr Cancerstiftelsen sr  
01/01/2024 → 31/12/2025

**CellCargo: Molecular mechanisms in cellular cargo trafficking complexes**

Huiskonen, J., Green, M., Lu, X., Nordlin, K. P., Sah Teli, S. K. & Song, X.  
Jane ja Aatos Erkon säätiö  
01/09/2021 → 31/08/2024

**SEMMA: Structures of Endogenous Macromolecular Complexes**

Huiskonen, J., Eshriew, E. K. & Kumpula, E. T.  
Suomen Akatemia Projektilaskutus  
01/09/2018 → 31/08/2022

**University profiling funding 7 InterEarth RESET**

Airavaara, M., Heiskanen, J., Huiskonen, J., Hyvärinen, M., Kulmala, M., Kulmala, M., Mervaala, E., Mäkelä, J., Primmer, C., Räsänen, A., Sironen, T., Toivonen, R., Aalto, P., Ahonen, L., Alakukku, L., Auvinen, P., Betz-Heinemann, A., Citterico, M., Ecke, F., El Wali, M., Eronen, J. T., Fuentenebro Alonso, P., Gammal, J., Green, S., Heikinheimo, A., Heinonen, M., Heinonen, S., Holopainen, M., Hyytiäinen, K., Kaartinen, T., Karhu, K., Kaukonen, M., Kerminen, V., Kiljunen, S., Kolari, P., Korpela, K., Lajunen, A., Lampilahti, J., Lehto, K., Lewandowska, A., Lindroos, M., Lintunen, A., Luomanen, P., Mietola, R., Mühleip, A. W., Nordström, M. C., Norkko, J., Omija Korpela, J. A., Paasonen, P., Pietikäinen, J., Pihlatie, M., Poupart, T. A., Raivonen, M., Ruohomäki, A. I., Ryhti, K., Sadeghibagherabadi, A., Sandström, V., Siven, M., Syrjä, P., Taira, T., Tani, S., Tanskanen, T. T., Tatti, N., Thomas, D. N., Tiira, T., Toppinen, A., Uimari, P., Uusitalo, J. A., Vainio, A., Varjosalo, M., Vartiainen, M., Veikkolainen, T. & Zaidan, M. A.  
Academy of Finland, Suomen Akatemia Projektilaskutus  
01/01/2023 → 31/12/2028