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## Publikationer

**Cell culture co- and superinfection experiments suggest that transmission during captivity contributes to the presence of reptarenavirus S and L segment swarms in boid inclusion body disease-positive snakes**

Lintala, A., Szirovicza, L., Sander, W. J., Ekström, E. J., Kipar, A., Hetzel, U. & Hepojoki, J., 11 dec. 2024, I: Journal of General Virology. 2024, 12

**Convalescent plasma therapy for COVID-19 – Donor selection strategies and establishment of a plasma bank**

Kajova, M., Khawaja, T., Levonen, I., Pietilä, J.-P., Virtanen, J., Pakkanen, S. H., Välimaa, H., Nousiainen, A., Hepojoki, J., Sironen, T., Vierikko, A., Ihalainen, J., Vapalahti, O. & Kantele, A., dec. 2024, I: New Microbes and New Infections . 62, 9 s., 101525.

**SARS-CoV-2 NSP16 promotes IL-6 production by regulating the stabilization of HIF-1 $\alpha$**

Mou, X., Luo, F., Zhang, W., Cheng, Q., Hepojoki, J., Zhu, S., Liu, Y., Xiong, H., Guo, D., Yu, J., Chen, L., Li, Y., Hou, W. & Chen, S., dec. 2024, I: Cellular Signalling. 124, 13 s., 111387.

**Multifocal cutaneous neoplastic vascular proliferations in a rainbow boa (*Epicrates cenchria*) collection with boid inclusion body disease**

Ferreira, A. B., Fontequé, J. H., Withoef, J. A., Casagrande, R. A., da Costa, U. M., Imkamp, F., Göller, P., Baggio, F., Hepojoki, J., Hetzel, U. & Kipar, A., nov. 2024, I: PLoS One. 19, 11, 18 s., e0311015.

**Circulating mucosal-like IgA responses increase with severity of Puumala orthohantavirus-caused hemorrhagic fever with renal syndrome**

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**Ancestral allele of DNA polymerase gamma modifies antiviral tolerance**

Kang, Y., Hepojoki, J., Maldonado, R. S., Mito, T., Terzioglu, M., Manninen, T., Kant, R., Singh, S., Othman, A., Verma, R., Uusimaa, J., Wartiovaara, K., Kareinen, L., Zamboni, N., Nyman, T. A., Paetau, A., Kipar, A., Vapalahti, O. & Suomalainen, A., 3 apr. 2024, I: Nature. 628, s. 844–853 10 s.

**Whole Blood as a Sample Matrix in Homogeneous Time-Resolved Assay—Förster Resonance Energy Transfer-Based Antibody Detection**

Lintala, A., Vapalahti, O., Nousiainen, A., Kantele, A. & Hepojoki, J., apr. 2024, I: Diagnostics. 14, 7, 11 s., 720.

**Comparative analysis of human, rodent and snake deltavirus replication**

Khalfi, P., Denis, Z., McKellar, J., Merolla, G., Chavey, C., Ursic-Bedoya, J., Soppa, L., Szirovicza, L., Hetzel, U., Dufourt, J., Leyrat, C., Goldmann, N., Goto, K., Verrier, E., Baumert, T. F., Glebe, D., Cournaud, V., Gregoire, D., Hepojoki, J. & Majzoub, K., mars 2024, I: PLoS Pathogens. 20, 3, 30 s., e1012060.

### **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, I: *Microbiology Spectrum*. 12, 4, 18 s.

### **A Multiplex RT-PCR Method for the Detection of Reptarenavirus Infection**

Baggio, F., Hetzel, U., Praehauser, B., Dervas, E., Michalopoulou, E., Thiele, T., Kipar, A. & Hepojoki, J., dec. 2023, I: *Viruses (Basel)*. 15, 12, 21 s., 2313.

### **ICTV Virus Taxonomy Profile: Arenaviridae 2023**

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### **Image-based and machine learning-guided multiplexed serology test for SARS-CoV-2**

Pietiäinen, V., Polso, M., Migh, E., Guckelsberger, C., Harmati, M., Diosdi, A., Turunen, L., Hassinen, A., Potdar, S., Koponen, A., Sebestyén, E. G., Kovacs, F., Kriston, A., Hollandi, R., Burian, K., Terhes, G., Visnyovszki, A., Fodor, E., Lacza, Z. & Kantele, A. och 12 andra, Kolehmainen, P., Kakkola, L., Strandin, T., Levanov, L., Kallioniemi, O., Kemeny, L., Julkunen, I., Vapalahti, O., Buzas, K., Paavolainen, L., Horvath, P. & Hepojoki, J., 28 aug. 2023, I: *Cell Reports Methods*. 3, 8, 20 s., 100565.

### **The Relationship Between SARS-CoV-2 Neutralizing Antibody Titers and Avidity in Plasma Collected From Convalescent nonvaccinated and Vaccinated Blood Donors**

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### **Reptarenavirus S Segment RNA Levels Correlate with the Presence of Inclusion Bodies and the Number of L Segments in Snakes with Reptarenavirus Infection-Lessons Learned from a Large Breeding Colony**

Thiele, T., Baggio, F., Praehauser, B., Subira, A. R., Michalopoulou, E., Kipar, A., Hetzel, U. & Hepojoki, J., juni 2023, I: *Microbiology Spectrum*. 11, 3, 16 s., e0506522.

### **Risk of lymphoid malignancies increased after Puumala virus infection in Finland, 2009-2019: A retrospective register-based cohort study**

Kääriäinen, S., Ollgren, J., Dub, T., Laine, O., Sinisalo, M., Hepojoki, J., Strandin, T., Kekäläinen, E., Sane, J. & Lyytikäinen, O., juni 2023, I: *International Journal of Infectious Diseases*. 131, s. 1-6 6 s.

### **Intranasal administration of adenoviral vaccines expressing SARS-CoV-2 spike protein improves vaccine immunity in mouse models**

Freitag, T. L., Fagerlund, R., Karam, N. L., Leppänen, V.-M., Ugurlu, H., Kant, R., Mäkinen, P., Tawfek, A., Kumar Jha, S., Strandin, T., Leskinen, K., Hepojoki, J., Kesti, T., Kareinen, L., Kuivanen, S., Koivulehto, E., Sormunen, A., Laidinen, S., Khattab, A. & Saavalainen, P. och 7 andra, Meri, S., Kipar, A., Sironen, T., Vapalahti, O., Alitalo, K., Ylä-Herttuala, S. & Saksela, K., 11 maj 2023, I: *Vaccine*. 41, 20, s. 3233-3246 14 s.

### **SARS-CoV-2 and type 1 diabetes in children in Finland: an observational study**

Finnish Pediat Diabet Register, Knip, M., Parviainen, A., Turtinen, M., But, A., Härkönen, T., Hepojoki, J., Sironen, T., Iheozor-Ejiofor, R., Ugurlu, H., Saksela, K., Lempainen, J., Ilonen, J. & Vapalahti, O., apr. 2023, I: *The Lancet diabetes & endocrinology*. 11, 4, s. 251-260 10 s.

### **Intranasal trimeric shephabody 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. och 3 andra, Huiskonen, J. T., Rissanen, I. & Saksela, K., 24 mars 2023, I: *Nature Communications*. 14, 1, 12 s., 1637.

### **Puumala Hantavirus Infections Show Extensive Variation in Clinical Outcome**

Vaheri, A., Smura, T., Vauhkonen, H., Hepojoki, J., Sironen, T., Strandin, T., Tietäväinen, J., Outinen, T., Mäkelä, S., Pörsti, I. & Mustonen, J., mars 2023, I: *Viruses-Basel*. 15, 3, 9 s., 805.

### **2022 taxonomic update of phylum Negarnaviricota (Riboviria: Orthornavirae), including the large orders Bunyvirales and Mononegavirales**

Kuhn, J. H., Adkins, S., Alkhovsky, S., Avsic-Zupanc, T., Ayllon, M. A., Bahl, J., Balkema-Buschmann, A., Ballinger, M. J., Bandte, M., Beer, M., Bejerman, N., Bergeron, E., Biedenkopf, N., Bigarre, L., Blair, C. D., Blasdel, K. R., Bradfute, S. B., Briese, T., Brown, P. A. & Bruggmann, R. och 161 andra, Buchholz, U. J., Buchmeier, M. J., Bukreyev, A., Burt, F., Buettner, C., Calisher, C. H., Candresse, T., Carson, J., Casas, I., Chandran, K., Charrel, R. N., Chiaki, Y., Crane, A., Crane, M., Dacheux, L., Dal Bo, E., de la Torre, J. C., de Lamballerie, X., de Souza, W. M., de Swart, R. L., Dheilly, N. M., Di Paola, N., Di Serio, F., Dietzgen, R. G., Digiario, M., Drexler, J. F., Duprex, W. P., Duerrwald, R., Easton, A. J., Elbeaino, T., Ergunay, K., Feng, G., Feuvrier, C., Firth, A. E., Fooks, A. R., Formenty, P. B. H., Freitas-Astua, J., Gago-Zachert, S., Garcia, M. L., Garcia-Sastre, A., Garrison, A. R., Godwin, S. E., Gonzalez, J.-P. J., de Bellocq, J. G., Griffiths, A., Groschup, M. H., Gunther, S., Hammond, J., Hepojoki, J., Hierweger, M. M., Hongo, S., Horie, M., Horikawa, H., Hughes, H. R., Hume, A. J., Hyndman, T. H., Jiang, D., Jonson, G. B., Junglen, S., Kadono, F., Karlin, D. G., Klempa, B., Klingstrom, J., Koch, M. C., Kondo, H., Koonin, E., Krasova, J., Krupovic, M., Kubota, K., Kuzmin, I., Laenen, L., Lambert, A. J., Li, J., Li, J.-M., Liefrig, F., Lukashovich, I. S., Luo, D., Maes, P., Marklewitz, M., Marshall, S. H., Marzano, S.-Y. L., McCauley, J. W., Mirazimi, A., Mohr, P. G., Moody, N. J. G., Morita, Y., Morrison, R. N., Muhlberger, E., Naidu, R., Natsuaki, T., Navarro, J. A., Neriya, Y., Netesov, S., Neumann, G., Nowotny, N., Ochoa-Corona, F. M., Palacios, G., Pallandre, L., Pallas, V., Papa, A., Paraskevopoulou, S., Parrish, C. R., Pauvolid-Correa, A., Paweska, J. T., Perez, D. R., Pfaf, F., Plemper, R. K., Postler, T. S., Pozet, F., Radoshitzky, S. R., Ramos-Gonzalez, P. L., Rehanek, M., Resende, R. O., Reyes, C. A., Romanowski, V., Rubbenstroth, D., Rubino, L., Rumbou, A., Runstadler, J. A., Rupp, M., Sabanadzovic, S., Sasaya, T., Schmidt-Posthaus, H., Schwemmle, M., Seuberlich, T., Sharpe, S. R., Shi, M., Sironi, M., Smither, S., Song, J.-W., Spann, K. M., Spengler, J. R., Stenglein, M. D., Takada, A., Tesh, R. B., Tesikova, J., Thornburg, N. J., Tischler, N. D., Tomitaka, Y., Tomonaga, K., Tordo, N., Tsunekawa, K., Turina, M., Tzanetakis, I. E., Vaira, A. M., van den Hoogen, B., Vanmechelen, B., Vasilakis, N., Verbeek, M., von Bargen, S., Wada, J., Wahl, V., Walker, P. J., Whitfield, A. E., Williams, J., Wolf, Y., Yamasaki, J., Yanagisawa, H., Ye, G., Zhang, Y.-Z. & Okland, A. L., dec. 2022, I: *Archives of Virology*. 167, 12, s. 2857–2906 50 s.

### **Boid Inclusion Body Disease Is Also a Disease of Wild Boa Constrictors**

Alfaro-Alarcon, A., Hetzel, U., Smura, T., Baggio, F., Alberto Morales, J., Kipar, A. & Hepojoki, J., 26 okt. 2022, I: *Microbiology Spectrum*. 10, 5, 17 s., e0170522.

### **Persistent Reptarenavirus and Hartmanivirus Infection in Cultured Boid Cells**

Lintala, A., Szivovicza, L., Kipar, A., Hetzel, U. & Hepojoki, J., aug. 2022, I: *Microbiology Spectrum*. 10, 4, 18 s., e0158522.

### **Clinical and Serological Findings of COVID-19 Participants in the Region of Makkah, Saudi Arabia**

Alzahrani, O. R., Alanazi, A. D., Kareinen, L., Hawsawi, Y. M., Alhadrami, H. A., Khogeer, A. A., Alatwi, H. E., Alharbi, A. A., Sironen, T., Vapalahti, O., Hepojoki, J. & Zakham, F., juli 2022, I: *Diagnostics*. 12, 7, 11 s., 1725.

### **Neutralizing Antibody Titers in Hospitalized Patients with Acute Puumala Orthohantavirus Infection Do Not Associate with Disease Severity**

Iheozor-Ejiofor, R., Vapalahti, K., Sironen, T., Levanov, L., Hepojoki, J., Lundkvist, Å., Mäkelä, S., Vaheri, A., Mustonen, J., Plyusnin, A., Strandin, T. M. & Vapalahti, O., maj 2022, I: *Viruses (Basel)*. 14, 5, 15 s., 901.

### **New-onset type 1 diabetes in Finnish children during the COVID-19 pandemic**

Salmi, H., Heinonen, S., Hästbacka, J., Lääperi, M., Rautiainen, P., Miettinen, P. J., Vapalahti, O., Hepojoki, J. & Knip, M., maj 2022, I: *Archives of Disease in Childhood*. 107, 2, s. 180-185 6 s.

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### **2021 Taxonomic update of phylum Negarnaviricota (Riboviria: Orthornavirae), including the large orders Bunyvirales and Mononegavirales**

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#### **A subpopulation of arenavirus nucleoprotein localizes to mitochondria**

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#### **Hantavirus infection-induced B cell activation elevates free light chains levels in circulation**

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#### **COVID-19 mRNA vaccine induced antibody responses against three SARS-CoV-2 variants**

Jalkanen, P., Kolehmainen, P., Häkkinen, H. K., Huttunen, M., Tähtinen, P. A., Lundberg, R., Maljanen, S., Reinholm, A., Tauriainen, S., Pakkanen, S. H., Levonen, I., Nousiainen, A., Miller, T., Välimaa, H., Ivaska, L., Pasternack, A., Naves, R., Ritvos, O., Österlund, P. & Kuivanen, S. och 7 andra, Smura, T., Hepojoki, J., Vapalahti, O., Lempainen, J., Kakkola, L., Kantele, A. & Julkunen, I., 28 juni 2021, I: Nature Communications. 12, 1, 11 s., 3991.

#### **Kinetics of neutralizing antibodies of covid-19 patients tested using clinical d614g, b.1.1.7, and b.1.351 isolates in microneutralization assays**

Virtanen, J., Uusitalo, R., Korhonen, E. M., Aaltonen, K., Smura, T., Kuivanen, S., Pakkanen, S. H., Mero, S., Patjas, A., Riekkinen, M., Kantele, A., Nurmi, V., Hedman, K., Hepojoki, J., Sironen, T., Huhtamo, E. & Vapalahti, O., juni 2021, I: Viruses (Basel). 13, 6, 9 s., 996.

#### **A Generic, Scalable, and Rapid Time-Resolved Förster Resonance Energy Transfer-Based Assay for Antigen Detection—SARS-CoV-2 as a Proof of Concept**

Rusanen, J., Kareinen, L., Szivoczka, L., Ugurlu, H., Levanov, L., Jääskeläinen, A., Ahava, M. J., Kurkela, S., Saksela, K., Hedman, K., Vapalahti, O. & Hepojoki, J., 18 maj 2021, I: mBio. 12, 3, 11 s., e00902-21.

#### **Evaluation of three rapid lateral flow antigen detection tests for the diagnosis of SARS-CoV-2 infection**

Jääskeläinen, A. E., Ahava, M. J., Jokela, P., Szivoczka, L., Pohjala, S., Vapalahti, O., Lappalainen, M., Hepojoki, J. & Kurkela, S., apr. 2021, I: Journal of Clinical Virology. 137, 4 s., 104785.

#### **Experimental Reptarenavirus Infection of Boa constrictor and Python regius**

Hetzel, U., Korzyukov, Y., Keller, S., Szivoczka, L., Pesch, T., Vapalahti, O., Kipar, A. & Hepojoki, J. M., apr. 2021, I: Journal of Virology. 95, 7, 18 s., e01968-20.

#### **A 10-Minute "Mix and Read" Antibody Assay for SARS-CoV-2**

Rusanen, J., Kareinen, L., Levanov, L., Mero, S. M., Pakkanen, S. H., Kantele, A., Amanat, F., Krammer, F., Hedman, K., Vapalahti, O. & Hepojoki, J., feb. 2021, I: Viruses (Basel). 13, 2, 12 s., 143.

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

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### **Cytoplasmic tails of hantavirus glycoproteins interact with the nucleocapsid protein**

Hepojoki, J., Strandin, T., Wang, H., Vapalahti, O., Vaehri, A. & Lankinen, H., 2010, I: Journal of General Virology. 91, 9, s. 2341-2350 10 s.

### **Electron Cryotomography of Tula Hantavirus Suggests a Unique Assembly Paradigm for Enveloped Viruses**

Huiskonen, J. T., Hepojoki, J., Laurinmaki, P., Vaehri, A., Lankinen, H., Butcher, S. J. & Gruenewald, K., 2010, I: Journal of Virology. 84, 10, s. 4889-4897 9 s.

### **Interactions and Oligomerization of Hantavirus Glycoproteins**

Hepojoki, J., Strandin, T., Vaehri, A. & Lankinen, H., 2010, I: Journal of Virology. 84, s. 227-242 16 s.

### **Degradation and aggresome formation of the Gn tail of the apathogenic Tula hantavirus**

Wang, H., Strandin, T., Hepojoki, J., Lankinen, H. & Vaehri, A., 2009, I: Journal of General Virology. 90, 12, s. 2995-3001 7 s.

### **Hantaviruses and TNF-alpha act synergistically to induce ERK1/2 inactivation in Vero E6 cells**

Strandin, T., Hepojoki, J., Wang, H., Vaehri, A. & Lankinen, H., 2008, I: Virology Journal. 5, 110, 9 s

### **Improvement of binding of Puumala virus neutralization site resembling peptide with a second-generation phage library**

Heiskanen, T., Li, X.-D., Hepojoki, J., Gustafsson, E., Lundkvist, Å., Vaehri, A. & Lankinen, H., juni 2003, I: Protein Engineering. 16, 6, s. 443-450 8 s.

## **Aktiviteter**

### **8th European Meeting on Viral Zoonoses, St. Raphael, France**

Hepojoki, J. (!!Speaker)

22 okt. 2017 → 25 okt. 2017

### **Annual Finnish Virology Days, 2017, Jyväskylä, Finland**

Hepojoki, J. (!!Speaker)

14 mars 2017 → 15 mars 2017

### **Virus-cell interactions 2015, Seili, Finland**

Hepojoki, J. (!!Speaker)

17 aug. 2015 → 19 aug. 2015

### **Vetsuisse Faculty, University of Zürich**

Hepojoki, J. (Besökande forskare)

9 nov. 2014 → 5 dec. 2014

### **Virus-cell interactions 2014, Seili, Finland**

Hepojoki, J. (!!Speaker)

18 aug. 2014 → 20 aug. 2014

### **Saskia Keller**

Hepojoki, J. (Värd)

23 juni 2014 → 13 aug. 2014

### **7th European Meeting on Viral Zoonoses, St:Raphael, France**

Hepojoki, J. (!!Speaker)

24 maj 2014 → 27 maj 2014

### **University of Oxford**

Hepojoki, J. (Besökande forskare)

9 feb. 2014 → 10 feb. 2014

### **Annual Finnish Virology Days, 2014, Helsinki, Finland**

Hepojoki, J. (Talare: Presentation)

2014

### **IX International conference on HFRS, HPS & hantaviruses, 2013, Beijing, China**

Hepojoki, J. (Talare: Presentation)

2013

### **6th European Meeting on Viral Zoonoses, 2011, St. Raphaël, France**

Hepojoki, J. (Talare: Presentation)

2011

### **Annual Finnish Virology Days, 2011, Jyväskylä, Finland**

Hepojoki, J. (Talare: Presentation)

2011

### **The 10th Finnish Peptide Symposium, 2011, Tahkovuori, Finland**

Hepojoki, J. (Talare: Presentation)

2011

**Annual Finnish Virology Days, 2010, Turku, Finland**

Hepojoki, J. (Talare: Presentation)  
2010

**5th European Meeting on Viral Zoonoses, 2009, St. Raphaël, France**

Hepojoki, J. (Talare: Presentation)  
2009

**Max Planck Institute of Biochemistry**

Hepojoki, J. (Besökande forskare)  
2009

**Annual Finnish Virology Days / ESCV, Clinical Virology Annual Meeting, 2008, Saariselkä, Finland**

Hepojoki, J. (Talare: Presentation)  
2008

**Annual Finnish Virology Days, 2006, Tampere, Finland**

Hepojoki, J. (Talare: Presentation)  
2006

**GBF (Gesellschaft für Biotechnologische Forschung)**

Hepojoki, J. (Besökande forskare)  
10 juli 2005 → 22 juli 2005

**Nordic Viral Zoonoses Meeting, 2005, Öland, Sweden**

Hepojoki, J. (Talare: Presentation)  
2005

## Projekt

**BIGMAC: Bioinspired inorganic nanoparticles-based mRNA antiviral vaccines**

Hepojoki, J. (Projektledare), Ojha, R. K. (deltagare) & Timin, E. A. (deltagare)  
Suomen Akatemia Projektilaskutus  
01/09/2023 → 31/08/2027

**Erkon säätiö Hepojoki 2022-2027**

Hepojoki, J. (Projektledare), Sander, W. J. (deltagare), Szivoczka, L. (deltagare) & Timin, E. A. (deltagare)  
Jane ja Aatos Erkon säätiö  
01/09/2022 → 31/08/2027

**Juselius, Hepojoki 2022-2026**

Hepojoki, J. (Projektledare), Ekström, E. J. (deltagare), Sander, W. J. (deltagare) & Szivoczka, L. (deltagare)  
Sigrid Juséliuksen Säätiö @003701165704@  
01/09/2022 → 31/08/2026