

Publications 2013 onwards where Structural Biology Finland (FINStruct) and Instruct Centre Finland services and expertise have been utilized

2021

1. Eesmaa A, Yu L-Y, Göös H, Nöges K, Kovaleva V, Hellman M, Zimmermann R, Jung M, Permi P, Varjosalo M, Lindholm P, Saarma M. 2021. The cytoprotective protein MANF promotes neuronal survival independently from its role as a GRP78 cofactor. *J. Biol. Chem*, in press.
2. Flatt, J.W., Domanska, A., Seppälä, A.L., Butcher, S.J. 2021. Identification of a conserved virion-stabilizing network inside the interprotomer pocket of enteroviruses. *Comms Biol*. accepted
3. Georgakis N, Poudel N, Vlachakis D, Papageorgiou AC, Labrou NE. 2021. Phi class glutathione transferases as molecular targets towards multiple-herbicide resistance: Inhibition analysis and pharmacophore design. *Plant Physiol Biochem* 158:342-352.
4. Gludovac E, Schuetzenberger K, Resch M, Tillmann K, Petroczi K, Vondra S, Vokal S, Schosserer M, Virgolini N, Pollheimer J, Salminen TA, Jilma B, Borth N, Boehm T. 2021. Human diamine oxidase cellular binding and internalization in vitro and rapid clearance in vivo are not mediated by N-glycans but by heparan sulfate proteoglycan interactions. *Glycobiology*. cwa090. Epub ahead of print.
5. Kurkela J, Fredman J, Salminen TA, Tyystjärvi T. 2021. Revealing secrets of the enigmatic omega subunit of bacterial RNA polymerase. *Mol Microbiol*. 115:1-11.
6. Mustonen V, Muruganandam G, Loris R, Kursula P, Ruskamo S. 2021. Crystal and solution structure of NDRG1, a membrane-binding protein linked to myelination and tumour suppression. *FEBS J*. 2020. Epub ahead of print.
7. Myllykoski M, Sutinen A, Koski MK, Kallio JP, Raasakka A, Myllyharju J, Wierenga RK, Koivunen P. 2021. Structure of transmembrane prolyl 4-hydroxylase reveals unique organization of EF and dioxygenase domains. *J Biol Chem*. Epub ahead of print.
8. Papageorgiou AC, Poudel N, Matsson J. 2021. Protein analysis with X-ray crystallography. *Methods Mol. Biol*. 2178:377-404.
9. Platis M, Vlachakis D, Foudah AI, Muharram MM, Alqarni MH, Papageorgiou AC, Labrou NE. 2021. The interaction of *Schistosoma japonicum* glutathione transferase with Cibacron blue 3GA and its fragments. *Med Chem* (in press)
10. Sowa ST, Moilanen A, Biterova E, Saaranen MJ, Lehtiö L, Ruddock LW. High-resolution crystal structure of human pERp1, a saposin-like protein involved in IgA, IgM and integrin maturation in the endoplasmic reticulum. *J Mol Biol*. 2021. Epub ahead of print.
11. Schwarzer S, Rodriguez-Franco M, Oksanen HM, Quax TEF. 2021. Growth phase dependent cell shape of Haloarcula. *Microorganisms*. 9:231.
12. Tittes C, Schwarzer S, Pfeiffer F, Dyall-Smith M, Rodriguez-Franco M, Oksanen HM, Quax TEF. 2021. Cellular and genomic properties of Haloferax gibbonsii LR2-5, the host of euryarchaeal virus HFTV1. *Front. Microbiol*. In Press
13. Wazir S, Maksimainen MM, Alanen HI, Galera-Prat A, Lehtiö L. 2021. Activity-based screening assay for mono-ADP-ribosylhydrolases. *SLAS Discov*. 26:67-76.

2020

1. Asthana P, Singh D, Pedersen JS, Hynönen MJ, Sulu R, Murthy VA, Laitaoja M, Jänis J, Riley LW, Venkatesan R. 2020. Structural insights on the substrate-binding proteins of the Mycobacterium tuberculosis mammalian-cell-entry (Mce) 1 and 4 complexes. *BioRxiv*. doi: <https://doi.org/10.1101/2020.09.29.317909>

2. Ashok Y, Maksimainen MM, Kallio T, Kilpeläinen P, Lehtiö L. 2020. FMN-dependent oligomerization of putative lactate oxidase from *Pediococcus acidilactici*. *PLoS One*. 15:e0223870.
3. Ashok Y, Miettinen M, Oliveira DKH, Tamirat MZ, Näreoja K, Tiwari A, Hottiger MO, Johnson MS, Lehtiö L, Pulliainen AT. 2020. Discovery of compounds inhibiting the ADP-ribosyltransferase activity of pertussis toxin. *ACS Infect Dis*. 6:588-602.
4. Barrass SV, Butcher SJ. Advances in high-throughput methods for the identification of virus receptors. 2020. *Med Microbiol Immunol*. 209:309-323.
5. Barylski J, Enault F, Dutilh BE, Schuller MBP, Edwards RA, Gillis A, Klumpp J, Knezevic P, Krupovic M, Kuhn JH, Lavigne R, Oksanen HM, Sullivan MB, Jang HB, Simmonds P, Aiewsakun P, Wittmann J, Tolstoy I, Brister JR, Kropinski AM, Adriaenssens EM. 2020. Analysis of spounaviruses as a case study for the overdue reclassification of tailed phages. *Syst Biol*. 69:110-123.
6. Bendes AA, Kursula P, Kursula I. 2020. Structure of an atypical homodimeric actin capping protein from the malaria parasite. *BioRxiv*. doi: <https://doi.org/10.1101/2020.08.16.253187>
7. Beyer HM, Mikula KM, Li M, Wlodawer A, Iwai H. 2020. The crystal structure of the naturally split gp41-1 intein guides the engineering of orthogonal split inteins from cis-splicing inteins. *FEBS J*. 287:1886-1898.
8. Beyer HM, Virtanen SI, Aranko AS, Mikula KM, Lountos GT, Wlodawer A, Ollila OHS, Iwai H. 2020. The convergence of the hedgehog/intein fold in different protein splicing mechanisms. *Int J Mol Sci*. 21:8367.
9. Carvalho DMD, Lahtinen, MH, Lawoko M, Mikkonen KS. 2020. Enrichment and identification of lignin-carbohydrate complexes in softwood extract, *ACS Sustainable Chem. Eng*. 8:11795–11804
10. Ciragan A, Backlund SM, Mikula KM, Beyer HM, Ollila OHS, Iwai H. 2020. NMR structure and dynamics of TonB investigated by scar-less segmental isotopic labeling using a salt-inducible split intein. *Front. Chem*. 8:136.
11. Cuellar J, Åstrand M, Elovaara H, Pietikäinen A, Sirén S, Liljeblad A, Guédez G, Salminen TA, Hytönen J. 2020. Structural and biomolecular analyses of *Borrelia burgdorferi* BmpD reveal a substrate-binding protein of an ABC-type nucleoside transporter family. *Infect Immun*. 88:e00962-19.
12. De S, Pollari M, Varjosalo M, Mäkinen K. 2020. Association of host protein VARICOSE with HCPro within a multiprotein complex is crucial for RNA silencing suppression, translation, encapsidation and systemic spread of potato virus A infection. *PLoS Pathog*. 16:e1008956.
13. Demina TA, Oksanen HM. 2020. Pleomorphic archaeal viruses: the family Pleolipoviridae is expanding by seven new species. *Arch Virol*. 165:2723-2731.
14. Flatt, J.W., Domanska, A., Seppälä, A.L., Butcher, S.J. 2020. Identification of a conserved virion-stabilizing network inside the interprotomer pocket of enteroviruses. *BioRxiv*: doi: <https://doi.org/10.1101/2020.07.06.189373>
15. Georgakis N, Poudel N, Papageorgiou AC, Labrou NE. 2020. Comparative structural and functional analysis of phi class glutathione transferases involved in multiple-herbicide resistance of grass weeds and crops. *Plant Physiol Biochem*. 149:266-276.
16. Harrus D, Harduin-Lepers A, Glumoff T. 2020. Unliganded and CMP-Neu5Ac bound structures of human α -2,6-sialyltransferase ST6Gal I at high resolution. *J Struct Biol*. 212:107628
17. Heliste J, Chheda H, Paatero I, Salminen TA, Akimov Y, Paavola J, Elenius K, Aittokallio T. 2020. Genetic and functional implications of an exonic TRIM55 variant in heart failure. *J Mol Cell Cardiol*. 138:222-233.
18. Hongisto H, Dewing JM, Christensen DR, Scott J, Cree AJ, Nättinen J, Määttä J, Jylhä A, Aapola U, Uusitalo H, Kaarniranta K, Ratnayaka JA, Skottman H, Lotery AJ. 2020. In vitro stem cell modelling demonstrates a proof-of-concept for excess functional mutant TIMP3 as the cause of Sorsby fundus dystrophy. *J Pathol*. 252:138-150.

19. Jaakkonen A, Volkmann G, Iwai H. 2020. An off-the-shelf approach for the production of Fc fusion proteins by protein trans-splicing towards generating a lectin body in vitro. *Int. J. Mol. Sci.* 21: 4011.
20. Jiang M, Österlund P, Poranen MM, Julkunen I. 2020. In vitro production of synthetic viral RNAs and their delivery into mammalian cells and the application of viral RNAs in the study of innate interferon responses. *Methods.* 183:21-29.
21. Johansson MM, Bélurier E, Papageorgiou AC, Sundin AP, Rahkila J, Kallonen T, Nilsson UJ, Maatsola S, Nyholm TKM, Käpylä J, Corander J, Leino R, Finne J, Teneberg S, Haataja S. 2020. The binding mechanism of the virulence factor *Streptococcus suis* adhesin P subtype to globotetraosylceramide is associated with systemic disease. *J. Biol. Chem.* 295: 14305-14324
22. Johansson MM, Bélurier E, Papageorgiou AC, Sundin AP, Rahkila J, Kallonen T, Nilsson UJ, Maatsola S, Nyholm TKM, Käpylä J, Corander J, Leino R, Finne J, Teneberg S, Haataja S. 2020. The binding mechanism of the virulence factor *Streptococcus suis* adhesin P subtype to globotetraosylceramide is associated with systemic disease. *bioRxiv* 2020.05.29.122762; doi: <https://doi.org/10.1101/2020.05.29.122762>
23. Johansson NG, Turku A, Vidilaseris K, Dreano L, Khattab A, Ayuso Pérez D, Wilkinson A, Zhang Y, Tamminen M, Grazhdankin E, Kiriazis A, Fishwick CWG, Meri S, Yli-Kauhala J, Goldman A, Boije Af Gennäs G, Xhaard H. 2020. Discovery of membrane-bound pyrophosphatase inhibitors derived from an isoxazole fragment. *ACS Med Chem Lett.* 11:605-610.
24. Kalke K, Lehtinen J, Gnjatovic J, Lund LM, Nyman MC, Paavilainen H, Orpana J, Lasanen T, Frejborg F, Levanova AA, Vuorinen T, Poranen MM, Hukkanen V. 2020. Herpes simplex virus type 1 clinical isolates respond to UL29-targeted siRNA swarm treatment independent of their acyclovir sensitivity. *Viruses.* 12:1434.
25. Karki S, Shkumatov AV, Bae S, Kim H, Ko J, Kajander T. 2020. Structural basis of SALM3 dimerization and synaptic adhesion complex formation with PTP σ . *Sci Rep.* 10:11557.
26. Kukkurainen S, Azizi L, Zhang P, Jacquier MC, Baikoghli M, von Essen M, Tuukkanen A, Laitaoja M, Liu X, Rahikainen R, Orłowski A, Jänis J, Määttä JAE, Varjosalo M, Vattulainen I, Róg T, Svergun D, Cheng RH, Wu J, Hytönen VP, Wehrle-Haller B. 2020. The F1 loop of the talin head domain acts as a gatekeeper in integrin activation and clustering. *J Cell Sci.* 133:jcs239202.
27. Leppänen VM, Brouillard P, Korhonen EA, Sipilä T, Jha SK, Revencu N, Labarque V, Fastré E, Schlögel M, Ravoet M, Singer A, Luzzatto C, Angelone D, Cricchiutti G, D'Elia A, Kuurne J, Elamaa H, Koh GY, Saharinen P, Vikkula M, Alitalo K. 2020. Characterization of *ANGPT2* mutations associated with primary lymphedema. *Sci Transl Med.* 12:eaax8013.
28. Levanova AA, Kalke KM, Lund LM, Sipari N, Sadeghi M, Nyman MC, Paavilainen H, Hukkanen V, Poranen MM. 2020. Enzymatically synthesized 2'-fluoro-modified Dicer-substrate siRNA swarms against herpes simplex virus demonstrate enhanced antiviral efficacy and low cytotoxicity. *Antiviral Res.* 182:104916.
29. Laurinmäki, P., Shakeel, S., Ekström, J., Mohammadi, P., Hultmark, D., Butcher, S.J. (2020) Structure of Nora virus at 2.7 Å resolution and implications for receptor binding, capsid stability and taxonomy. *Scientific Reports* 10:19675 <https://doi.org/10.1038/s41598-020-76613-1>
30. Mahato AK, Kopra J, Renko JM, Visnapuu T, Korhonen I, Pulkkinen N, Bernal MM, Domanskyi A, Ronken E, Piepponen TP, Voutilainen MH, Tuominen RK, Karelson M, Sidorova YA, Saarma M. 2020. Glial cell line-derived neurotrophic factor receptor Rearranged during transfection agonist supports dopamine neurons in Vitro and enhances dopamine release In Vivo. *Mov Disord.* 35:245-255.
31. Mattila ALK, Jiggins CD, Opedal ØH, Montejo-Kovacevich G, de Castro É, McMillan WO, Bacquet C, Saastamoinen M. 2020. High evolutionary potential in the chemical defenses of an aposematic *Heliconius* butterfly, *bioRxiv* 2020.01.14.905950

32. Mofikoya OO, Mäkinen M, Jänis J. 2020. Chemical fingerprinting of conifer needle essential oils and solvent extracts by ultrahigh-resolution fourier transform ion cyclotron resonance mass spectrometry. *ACS Omega*. 5:10543-10552.
33. Myllykoski M, Sutinen A, Koski MK, Kallio JP, Raasakka A, Myllyharju J, Wierenga R, Koivunen P. 2020. Structure of transmembrane prolyl 4-hydroxylase reveals unique organization of EF and dioxygenase domains. *BioRxiv*. doi: <https://doi.org/10.1101/2020.10.25.354423>
34. Mäntynen S, Laanto E, Sundberg LR, Poranen MM, Oksanen HM, ICTV Report Consortium. 2020. ICTV Virus Taxonomy Profile: Finnlakeviridae. *J Gen Virol*. 101:894-895.
35. Nguyen GTT, Sutinen A, Raasakka A, Muruganandam G, Loris R, Kursula P. 2020. Structure of the complete dimeric human GDAP1 core domain provides insights into ligand binding and clustering of disease mutations. *BioRxiv*. doi: <https://doi.org/10.1101/2020.11.13.381293>
36. Nji Wandji B, Siitonen V, Dinis P, Vukic V, Salminen TA, Metsä-Ketelä M. 2020. Evolution-guided engineering of non-heme iron enzymes involved in nogalamycin biosynthesis. *FEBS J*. 287:2998-3011.
37. Oeemig JS, Beyer HM, Aranko AS, Mutanen J, Iwai H. 2020. Substrate specificities of inteins investigated by QuickDrop-cassette mutagenesis. *FEBS Lett*. 594:3338-3355.
38. Orengo C, Velankar S, Wodak S, Zoete V, Bonvin AMJJ, Elofsson A, Feenstra KA, Gerloff DL, Hamelryck T, Hancock JM, Helmer-Citterich M, Hospital A, Orozco M, Perrakis A, Rarey M, Soares C, Sussman JL, Thornton JM, Tuffery P, Tusnady G, Wierenga R, Salminen T, Schneider B. 2020. A community proposal to integrate structural bioinformatics activities in ELIXIR (3D-Bioinfo Community). *F1000Res*. 9:ELIXIR-278.
39. Papageorgiou AC, Mohsin I. 2020. The SARS-CoV-2 spike glycoprotein as a drug and vaccine target: structural insights into its complexes with ACE2 and antibodies. *Cells* 9: 2343.
40. Premetis G, Marugas P, Fanos G, Vlachakis D, Chronopoulou EG, Perperopoulou F, Dubey KK, Shukla P, Foudah AI, Muharram MM, Aldwsari MF, Papageorgiou AC, Labrou NE. 2020. The interaction of the microtubule targeting anticancer drug colchicine with human glutathione transferases. *Curr Pharm Des* 26: 5205-5212
41. Saari H, Turunen T, Löhmus A, Turunen M, Jalasvuori M, Butcher SJ, Ylä-Herttuala S, Viitala T, Cerullo V, Siljander PRM, Yliperttula M. 2020. Extracellular vesicles provide a capsid-free vector for oncolytic adenoviral DNA delivery. *J Extracell Vesicles*. 9:1747206.
42. Sah-Teli SK, Hynönen MJ, Sulu R, Dalwani S, Schmitz W, Wierenga RK, Venkatesan R. 2020. Insights into the stability and substrate specificity of the *E. coli* aerobic β -oxidation trifunctional enzyme complex. *J Struct Biol*. 210:107494.
43. Seifert M, van Nies P, Papini FS, Arnold JJ, Poranen MM, Cameron CE, Depken M, Dulin D. 2020. Temperature controlled high-throughput magnetic tweezers show striking difference in activation energies of replicating viral RNA-dependent RNA polymerases. *Nucleic Acids Res*. 48:5591-5602.
44. Seifert M, van Nies P, Papini FS, Arnold JJ, Poranen MM, Cameron CE, Depken M, Dulin D. 2020. Temperature controlled high-throughput magnetic tweezers show striking difference in activation energies of replicating viral RNA-dependent RNA polymerases. *bioRxiv* 2020.01.15.906032
45. Sridhar S, Schmitz W, Hiltunen JK, Venkatesan R, Bergmann U, Kiema TR, Wierenga RK. 2020. Crystallographic binding studies of rat peroxisomal multifunctional enzyme type 1 with 3-ketodecanoyl-CoA: capturing active and inactive states of its hydratase and dehydrogenase catalytic sites. *Acta Crystallogr D Struct Biol*. 76:1256-1269.
46. Sirén S, Dahlström KM, Puttreddy R, Rissanen K, Salminen TA, Scheinin M, Li XG, Liljeblad A. 2020. *Candida antarctica* lipase A-based enantioselective recognition of a highly strained 4-dibenzocyclooctynol (DIBO) used for PET imaging. *Molecules*. 25:879.

47. Sowa ST, Vela-Rodríguez C, Galera-Prat A, Cázares-Olivera M, Prunskaitė-Hyyryläinen R, Ignatev A, Lehtiö L. 2020. A FRET-based high-throughput screening platform for the discovery of chemical probes targeting the scaffolding functions of human tankyrases. *Sci Rep.* 10:12357.
48. Storey D, McNally A, Åstrand M, Sa-Pessoa Graca Santos J, Rodriguez-Escudero I, Elmore B, Palacios L, Marshall H, Hogley L, Molina M, Cid VJ, Salminen TA, Bengoechea JA. 2020. Klebsiella pneumoniae type VI secretion system-mediated microbial competition is PhoPQ controlled and reactive oxygen species dependent. *PLoS Pathog.* 16:e1007969.
49. Thapa R, Nissinen T, Turhanen P, Määttä J, Vepsäläinen J, Lehto V-P, Riikonen J. 2020. Bisphosphonate modified mesoporous silicon for scandium adsorption. *Microporous and Mesoporous Materials* 296:109980
50. Tittes C, Schwarzer S, Pfeiffer F, Dyll-Smith M, Rodriguez-Franco M, Oksanen HM, Quax TEF. 2020. Cellular and genomic properties of Haloferax gibbonsii LR2-5, the host of euryarchaeal virus HFTV1. *bioRxiv.* 2020.10.26.354720
51. Tuusa J, Koski MK, Ruskamo S, Tasanen K. 2020. The intracellular domain of BP180/collagen XVII is intrinsically disordered and partially folds in an anionic membrane lipid-mimicking environment. *Amino Acids.* 52:619-627.
52. Vakal S, Jalkanen S, Dahlström KM, Salminen TA. 2020. Human copper-containing amine oxidases in drug design and development. *Molecules.* 25:1293.
53. Valanne S, Järvelä-Stölting M, Harjula SE, Myllymäki H, Salminen TS, Rämetsä M. 2020. Osa-containing brahma complex regulates innate immunity and the expression of metabolic genes in *Drosophila*. *J Immunol.* 204:2143-2155.
54. Viisanen H, Nuotio U, Kambur O, Mahato AK, Jokinen V, Lilius T, Li W, Santos HA, Karelson M, Rauhala P, Kalso E, & Sidorova YA. 2020. Novel RET agonist for the treatment of experimental neuropathies. *Molecular Pain.* 16:1744806920950866.
55. Virtanen SI, Kiirikki AM, Mikula KM, Iwai H, Ollila OHS. 2020. Heterogeneous dynamics in partially disordered proteins. *Phys. Chem. Chem. Phys.* 22:21185-21196.
56. Wang L, Borghei M, Ishfaq A, Lahtinen P, Ago M, Papageorgiou AC, Lundahl M, Johansson LS, Kallio T, Rojas OJ. 2020. Mesoporous carbon microfibers for electroactive materials derived from lignin-containing nanocellulose *ACS Sustain Chem Eng* 8 (23): 8549-8561.
57. Wazir S, Maksimainen MM, Lehtiö L. Multiple crystal forms of human MacroD2. 2020. *Acta Crystallogr F Struct Biol Commun.* 76477-482.
58. Zhang P, Azizi L, Kukkurainen S, Gao T, Baikoghli M, Jacquier MC, Sun Y, Määttä JAE, Cheng RH, Wehrle-Haller B, Hytönen VP, Wu J. 2020. Crystal structure of the FERM-folded talin head reveals the determinants for integrin binding. *Proc Natl Acad Sci U S A.* 117:32402-32412.

2019

1. Abdelkreem E, Harijan RK, Yamaguchi S, Wierenga RK, Fukao T. 2019. Mutation update on ACAT1 variants associated with mitochondrial acetoacetyl-CoA thiolase (T2) deficiency. *Hum Mutat.* 40:1641-1663.
2. Abdelnabi R, Geraets JA, Ma Y, Mirabelli C, Flatt JW, Domanska A, Delang L, Jochmans D, Jayaprakash V, Sinha BN, Leyssen P, Butcher SJ, Neyts J. 2019. A novel druggable interprotomer pocket in the capsid of rhino- and enteroviruses. *PLoS Biology* 17(6):e3000281
3. Agrawal N, Lehtonen SI, Uusi-Mäkelä M, Jain P, Viitala S, Määttä JAE, Kähkönen N, Azizi L, Riihimäki TA, Kulomaa MS, Johnson MS, Hytönen VP, Airene TT. 2019. Molecular features of steroid-binding antidins and their use for assaying serum progesterone. *PLoS One.* 14:e0212339.
4. Agustin MB, Penttilä PA, Lahtinen M, Mikkonen KS. 2019. Rapid and direct preparation of lignin nanoparticles from alkaline pulping liquor by mild ultrasonication. *ACS Sustainable Chem. Eng.* 7:19925–19934

5. Ashok Y, Maksimainen MM, Kallio T, Kilpeläinen P, Lehtiö L. 2019. FMN-dependent oligomerization of putative lactate oxidase from *Pediococcus acidilactici*. *BioRxiv*. doi: <https://doi.org/10.1101/790964>
6. Ashok Y, Miettinen M, Oliveira DKH, Tamirat MZ, Näreoja K, Tiwari A, Hottiger MO, Johnson MS, Lehtiö L, Pulliainen AT. 2019. Discovery of compounds inhibiting the ADP-ribosyltransferase activity of pertussis toxin. *BioRxiv*. doi: <https://doi.org/10.1101/637801>
7. Beyer HM, Mikula KM, Kudling TV, Iwai H. 2019. Crystal structures of CDC21-1 inteins from hyperthermophilic archaea reveal the selection mechanism for the highly conserved homing endonuclease insertion site. *Extremophiles*. 23:669-679.
8. Biterova EI, Isupov MN, Keegan RM, Lebedev AA, Sohail AA, Liaqat I, Alanen HI, Ruddock LW. 2019. The crystal structure of human microsomal triglyceride transfer protein. *Proc Natl Acad Sci U S A*. 116:17251-17260.
9. Brennecke P, Rasina D, Aubi O, Herzog K, Landskron J, Cautain B, Vicente F, Quintana J, Mestres J, Stechmann B, Ellinger B, Brea J, Kolanowski JL, Pilarski R, Orzaez M, Pineda-Lucena A, Laraia L, Nami F, Zielenkiewicz P, Paruch K, Hansen E, von Kries JP, Neuenschwander M, Specker E, Bartunek P, Simova S, Leśnikowski Z, Krauss S, Lehtiö L, Bilitewski U, Brönstrup M, Taskén K, Jirgensons A, Lickert H, Clausen MH, Andersen JH, Vicent MJ, Genilloud O, Martinez A, Nazaré M, Fecke W, Gribbon P. 2019. EU-OPENSREEN: A novel collaborative approach to facilitate chemical biology. *SLAS Discov*. 24:398-413.
10. Chakraborty AA, Laukka T, Myllykoski M, Ringel AE, Booker MA, Tolstorukov MY, Meng YJ, Meier SR, Jennings RB, Creech AL, Herbert ZT, McBrayer SK, Olenchock BA, Jaffe JD, Haigis MC, Beroukhim R, Signoretti S, Koivunen P, Kaelin WG Jr. 2019. Histone demethylase KDM6A directly senses oxygen to control chromatin and cell fate. *Science*. 363:1217-1222.
11. Chiarini V, Tossavainen H, Sharma V, Colotti G. 2019. NMR structure of a non-conjugatable, ADP-ribosylation associated, ubiquitin-like domain from *Tetrahymena thermophila* polyubiquitin locus. *Biochim Biophys Acta Gen Subj*. 1863:749-759.
12. Chronopoulou EG, Vlachakis D, Papageorgiou AC, Ataya FS, Labrou NE. 2019. Structure-based design and application of an engineered glutathione transferase for the development of an optical biosensor for pesticides determination. *Biochim Biophys Acta Gen Subj*. 1863:565-576.
13. De Colibus L, Roine E, Walter TS, Ilca SL, Wang X, Wang N, Roseman AM, Bamford D, Huiskonen JT, Stuart DI. 2019. Assembly of complex viruses exemplified by a halophilic euryarchaeal virus. *Nat Commun*. 10:1456.
14. Domanska A, Flatt JW, Jukonen JJJ, Geraets JA, Butcher SJ. 2019. A 2.8-Å resolution cryo-EM structure of human parechovirus 3 in complex with Fab from a neutralizing antibody. *J. Virol*. 93(4): e01597-18.
15. El Omari K, Li S, Kotecha A, Walter TS, Bignon EA, Harlos K, Somerharju P, De Haas F, Clare DK, Molin M, Hurtado F, Li M, Grimes JM, Bamford DH, Tischler ND, Huiskonen JT, Stuart DI, Roine E. 2019. The structure of a prokaryotic viral envelope protein expands the landscape of membrane fusion proteins. *Nat Commun*. 10:846.
16. Eskelin K, Poranen MM, Oksanen HM. 2019. Asymmetrical flow field-flow fractionation on virus and virus-like particle applications. *Microorganisms*. 7:e555.
17. Flatt JW, Butcher SJ. Adenovirus flow in host cell networks. 2019. *Open Biol*. 9:190012.
18. Freidin M, Kraatari M, Skarp S, Määttä J, Kettunen J, Niinimäki J, Karppinen J, Williams F, Männikkö M. 2019. Genome-wide meta-analysis identifies genetic locus on chromosome 9 associated with Modic changes. *J Med Genet*. 56:420-426.
19. Gering C, Koivisto JT, Parraga J, Leppiniemi J, Vuornos K, Hytönen VP, Miettinen S, Kellomäki M. 2019. Design of modular gellan gum hydrogel functionalized with avidin and biotinylated adhesive ligands for cell culture applications. *PLoS One*. 14:e0221931.

20. Guédez G, Pothipongsa A, Sirén S, Liljelblad A, Jantaro S, Incharoensakdi A, Salminen TA. 2019. Crystal structure of dimeric Synechococcus spermidine synthase with bound polyamine substrate and product. *Biochem J.* 476:1009-1020.
21. Haka J, Niemi MH, Mattila P, Jänis J, Takkinen K, Rouvinen J. 2019. Development of hypoallergenic variants of the major horse allergen Equ c 1 for immunotherapy by rational structure based engineering. *Sci Rep.* 9:20148.
22. Hankaniemi MM, Stone VM, Andrejeff T, Heinimäki S, Sioofy-Khojine AB, Marjomäki V, Hyöty H, Blazevic V, Flodström-Tullberg M, Hytönen VP, Laitinen OH. 2019. Formalin treatment increases the stability and immunogenicity of coxsackievirus B1 VLP vaccine. *Antiviral Res.* 171:104595.
23. Heinimäki S, Hankaniemi MM, Sioofy-Khojine AB, Laitinen OH, Hyöty H, Hytönen VP, Vesikari T, Blazevic V. 2019. Combination of three virus-derived nanoparticles as a vaccine against enteric pathogens; enterovirus, norovirus and rotavirus. *Vaccine.* 37:7509-7518
24. Ilca SL, Sun X, El Omari K, Kotecha A, de Haas F, DiMaio F, Grimes JM, Stuart DI, Poranen MM, Huiskonen JT. 2019. Multiple liquid crystalline geometries of highly compacted nucleic acid in a dsRNA virus. *Nature.* 570(7760):252-256.
25. Jiang M, Österlund P, Westenius V, Guo D, Poranen MM, Bamford DH, Julkunen I. 2019. Efficient inhibition of avian and seasonal influenza A viruses by a virus-specific dicer-substrate small interfering RNA swarm in human monocyte-derived macrophages and dendritic Cells. *J Virol.* 93:e01916-18.
26. Karki S, Maksimainen MM, Lehtiö L, Kajander T. 2019. Inhibitor screening assay for neurexin-LRRTM adhesion protein interaction involved in synaptic maintenance and neurological disorder. *Anal Biochem.* 587:113463.
27. Kiema TR, Thapa CJ, Laitaoja M, Schmitz W, Maksimainen MM, Fukao T, Rouvinen J, Jänis J, Wierenga RK. 2019. The peroxisomal zebrafish SCP2-thiolase (type-1) is a weak transient dimer as revealed by crystal structures and native mass spectrometry. *Biochem J.* 476:307-332.
28. Kinnebrew M, Iverson EJ, Patel BB, Pusapati GV, Kong JH, Johnson KA, Luchetti G, Eckert KM, McDonald JG, Covey DF, Siebold C, Radhakrishnan A, Rohatgi R. 2019. Cholesterol accessibility at the ciliary membrane controls hedgehog signaling. *Elife.* 8:e50051.
29. Kotila T, Wioland H, Enkavi G, Kogan K, Vattulainen I, Jégou A, Romet-Lemonne G, Lappalainen P. 2019. Mechanism of synergistic actin filament pointed end depolymerization by cyclase-associated protein and cofilin. *Nat Commun.* 10:5320.
30. Laajala M, Hankaniemi MM, Määttä JAE, Hytönen VP, Laitinen OH, Marjomäki V. 2019. Host cell calpains can cleave structural proteins from the enterovirus polyprotein. *Viruses.* 11:1106.
31. Li DC, Papageorgiou AC. 2019. Cellulases from thermophilic fungi: Recent insights and biotechnological potential. In: *Fungi in Extreme Environments: Ecological Role and Biotechnological Significance*. Eds: Tiquia-Arahiro SM, Grube M. Springer International Publishing pp. 395-417.
32. Lopes de Carvalho L, Bligt-Lindén E, Ramaiah A, Johnson MS, Salminen TA. 2019. Evolution and functional classification of mammalian copper amine oxidases. *Mol Phylogenet Evol.* 139:106571.
33. Lyytinen OL, Starkova D, Poranen MM. 2019. Microbial production of lipid-protein vesicles using enveloped bacteriophage phi6. *Microb Cell Fact.* 18:29.
34. Mattila A, Andsten RM, Jumppanen M, Assante M, Jokela J, Wahlsten M, Mikula KM, Sigindere C, Kwak DH, Gugger M, Koskela H, Sivonen K, Liu X, Yli-Kauhaluoma J, Iwai H, Fewer DP. 2019. Biosynthesis of the bis-prenylated alkaloids muscoride A and B. *ACS Chem Biol.* 14: 2683-2690.
35. Mäntynen S, Sundberg LR, Oksanen HM, Poranen MM. 2019. Half a century of research on membrane-containing bacteriophages: bringing new concepts to modern virology. *Viruses* 11: e76.
36. Mennesson M, Rydgren E, Lipina T, Sokolowska E, Kuleskaya N, Morello F, Ivakine E, Voikar V, Risbrough V, Partanen J, Hovatta I. 2019. Kainate receptor auxiliary subunit NETO2 is required for normal fear expression and extinction. *Neuropsychopharmacology.* 44:1855-1866.
37. Mikula KM, Kolodziejczyk R, Goldman A. 2019. Structure of the UspA1 protein fragment from *Moraxella catarrhalis* responsible for C3d binding. *J Struct Biol.* 208:77-85.

38. Minard G, Tikhonov G, Ovaskainen O, Saastamoinen M. 2019. The microbiome of the *Melitaea cinxia* butterfly shows marked variation but is only little explained by the traits of the butterfly or its host plant. *Environ Microbiol.* 21:4253-4269.
39. Mizuno CM, Prajapati B, Lucas-Staat S, Sime-Ngando T, Forterre P, Bamford DH, Prangishvili D, Krupovic M, Oksanen HM. 2019. Novel haloarchaeal viruses from Lake Retba infecting *Haloferax* and *Halorubrum* species. *Environ Microbiol.* 21:2129-2147.
40. Mollerup F, Aumala V, Parikka K, Mathieu Y, Brumer H, Tenkanen M, Master E. 2019. A family AA5_2 carbohydrate oxidase from *Penicillium rubens* displays functional overlap across the AA5 family. *PLoS One.* 14:e0216546.
41. Mönnttinen HAM, Ravantti JJ, Poranen MM. 2019. Structural comparison strengthens the higher-order classification of proteases related to chymotrypsin. *PLoS One.* 14(5):e0216659.
42. Mohsin I, Poudel N, Li DC, Papageorgiou AC. 2019. Crystal Structure of a GH3 β -Glucosidase from the Thermophilic Fungus *Chaetomium thermophilum*. *Int J Mol Sci.* 20:5962.
43. Ojanen MJT, Uusi-Mäkelä MIE, Harjula SE, Saralahti AK, Oksanen KE, Kähkönen N, Määttä JAE, Hytönen VP, Pesu M, Rämetsä M. 2019. Intelectin 3 is dispensable for resistance against a mycobacterial infection in zebrafish (*Danio rerio*). *Sci Rep.* 9:995
44. Oksanen HM, and Abrescia NGA. 2019. Membrane-containing icosahedral bacteriophage PRD1: the dawn of viral lineages. In: *Advances in Experimental Medicine and Biology - 'Physical Virology - Virus Structure and Mechanics'*. Ed: Greber, U. Springer. 1140:85-109.
45. Papageorgiou, AC. 2019. X-ray crystallography in structure-function characterization of therapeutic enzymes. *Adv. Exper. Med. Biol.* 1148, 81-103.
46. Pooch F, Slieden M, Knudsen KD, Nyström B, Tenhu H, Winnik FM. 2019. Poly(2-isopropyl-2-oxazoline)-b-poly(lactide) (PiPOx-b-PLA) nanoparticles in water: interblock van der Waals attraction opposes amphiphilic phase separation. *Macromolecules.* 52:1317-1326.
47. Raasakka A, Ruskamo S, Kowal J, Han H, Baumann A, Myllykoski M, Fasano A, Rossano R, Riccio P, Bürck J, Ulrich AS, Stahlberg H, Kursula P. 2019. Molecular structure and function of myelin protein PO in membrane stacking. *Sci Rep.* 9:642.
48. Rehan S, Shahid S, Salminen TA, Jaakola VP, Paavilainen VO. 2019. Current progress on equilibrative nucleoside transporter function and inhibitor design. *SLAS Discov.* 24:953-968
49. Richardson D, Itkonen J, Nievas J, Urtti A, Casteleijn MG. 2019. Accelerated pharmaceutical protein development with integrated cell free expression, purification, and bioconjugation. *Sci Rep.* 8:11967.
50. Ruokolainen V, Domanska A, Laajala M, Pelliccia M, Butcher SJ, Marjomäki V. 2019. Extracellular albumin and endosomal ions prime enterovirus particles for uncoating that can be prevented by fatty acid saturation. *J. Virol.* 93:e00599-19.
51. Sah-Teli SK, Hynönen MJ, Schmitz W, Geraets JA, Seitsonen J, Pedersen JS, Butcher SJ, Wierenga RK, Venkatesan R. 2019. Complementary substrate specificity and distinct quaternary assembly of the *Escherichia coli* aerobic and anaerobic β -oxidation trifunctional enzyme complexes. *Biochem J.* 476:1975-1994.
52. Salminen TS, Cannino G, Oliveira MT, Lillsunde P, Jacobs HT, Kaguni LS. 2019. Lethal Interaction of Nuclear and Mitochondrial Genotypes in *Drosophila melanogaster*. *G3 (Bethesda).* 9:2225-2234.
53. Santos-Pérez I, Charro D, Gil-Carton D, Azkargorta M, Elortza F, Bamford DH, Oksanen HM, Abrescia NGA. 2019. Structural basis for assembly of vertical single β -barrel viruses. *Nat Commun.* 10:1184.
54. Siddiqui FA, Alam C, Rosenqvist P, Ora M, Sabt A, Manoharan GB, Bindu L, Okutachi S, Catillon M, Taylor T, Abdelhafez OM, Lönnberg H, Stephen AG, Papageorgiou AC, Virta P, Abankwa D. 2019. aPDE6D inhibitors with a new design principle selectively block K-Ras Activity. *ACS Omega.* 5:832-842.
55. Sjöstedt N, Salminen TA, Kidron H. 2019. Endogenous, cholesterol-activated ATP-dependent transport in membrane vesicles from *Spodoptera frugiperda* cells. *Eur J Pharm Sci.* 137:104963.
56. Szigetvari PD, Muruganandam G, Kallio JP, Hallin EI, Fossbakk A, Loris R, Kursula I, Møller LB, Knappskog PM, Kursula P, Haavik J. 2019. The quaternary structure of human tyrosine hydroxylase:

- effects of dystonia-associated missense variants on oligomeric state and enzyme activity. *J Neurochem.* 148:291-306.
57. Takkinen K, Rouvinen J. 2019. Allergeenien ja IgE-vasta-aineiden rakennetutkimuksesta uuden sukupolven allergiarokotteiden kehitykseen. *Dosis* 2/2019
 58. Thangaraj S, Arola H, Tullila A, Nevanen T, Rouvinen J & Jänis J. 2019. Quantitation of thyroid hormone binding to anti-thyroxine antibody Fab fragment by native mass spectrometry. *ACS Omega* 4:18718-18724.
 59. Thangaraj SK, James S, Rouvinen J, Jänis J. 2019. Thermokinetic analysis of protein subunit exchange by variable-temperature native mass spectrometry. *Biochemistry.* 58:5025-5029.
 60. Thangaraj SK, Voutilainen S, Andberg M, Koivula A, Jänis J, Rouvinen J. 2019. Bioconjugation with aminoalkylhydrazine for efficient mass spectrometry-based detection of small carbonyl compounds. *ACS Omega.* 4:13447-13453.
 61. Theoharaki C, Chronopoulou E, Vlachakis D, Ataya FS, Giannopoulos P, Maurikou S, Skopelidou K, Papageorgiou AC, Labrou NE. 2019. Delineation of the functional and structural properties of the glutathione transferase family from the plant pathogen *Erwinia carotovora*. *Funct. Integr. Gen.* 19:1-12.
 62. Valanne S, Salminen TS, Järvelä-Stölting M, Vesala L, Rämetsä M. 2019. Immune-inducible non-coding RNA molecule lincRNA-IBIN connects immunity and metabolism in *Drosophila melanogaster*. *PLoS Pathog.* 15:e1007504.
 63. Valoppi F, Lahtinen MH, Bhattarai M, Kirjoranta SJ, Juntti VK, Peltonen LJ, Kilpeläinen PO, Mikkonen KS. 2019. Centrifugal fractionation of softwood extracts improves the biorefinery workflow and yields functional emulsifiers. *Green Chem.* 21: 4691-4705.
 64. Vidilaseris K, Johansson NG, Turku A, Kiriazis A, Boije Af Gennäs G, Yli-Kauhaluoma J, Xhaard H, Goldman A. 2019. Screening for *Thermotoga maritima* membrane-bound pyrophosphatase inhibitors. *J Vis Exp.* 153.
 65. Vidilaseris K, Kiriazis A, Turku A, Khattab A, Johansson NG, Leino TO, Kiuru PS, Boije Af Gennäs G, Meri S, Yli-Kauhaluoma J, Xhaard H, Goldman A. 2019. Asymmetry in catalysis by *Thermotoga maritima* membrane-bound pyrophosphatase demonstrated by a nonphosphorus allosteric inhibitor. *Sci Adv.* 5:eaav7574.
 66. Wang L, Ago M, Borghei M, Ishaq A, Papageorgiou AC, Lundahl M, Rojas OM. 2019. Conductive carbon microfibers derived from wet-spun lignin/nanocellulose hydrogels. *ACS Sustain. Chem. Eng.* 7(6):6013-6022.
 67. Wang L, Lundahl MJ, Greca LG, Papageorgiou AC, Borghei M, Rojas OJ. 2019. Effects of non-solvents and electrolytes on the formation and properties of cellulose I filaments. *Sci Rep.* 9:16691.
 68. Wang L, Yan Z, Vihinen H, Eriksson O, Wang W, Soliymani R, Lu Y, Xue Y, Jokitalo E, Li J, Zhao H. 2019. FAM92A1 is a BAR domain protein required for mitochondrial ultrastructure and function. *J Cell Biol.* 218:97-111.
 69. Wolthers KC, Susi P, Jochmans D, Koskinen J, Landt O, Sanchez N, Palm K, Neyts J, Butcher SJ. 2019. Progress in human picornavirus research: New findings from the AIROPico consortium. *Antiviral Res.* 161:100-107.
 70. Åstrand M, Cuellar J, Hytönen J, Salminen TA. 2019. Predicting the ligand-binding properties of *Borrelia burgdorferi* s.s. Bmp proteins in light of the conserved features of related *Borrelia* proteins. *J Theor Biol.* 462:97-108.

2018

1. Adriaenssens EM, Wittmann J, Kuhn JH, Turner D, Sullivan MB, Dutilh BE, Jang HB, van Zyl LJ, Klumpp J, Lobočka M, Moreno Switt AI, Rumnieks J, Edwards RA, Uchiyama J, Alfenas-Zerbini P, Petty NK, Kropinski AM, Barylski J, Gillis A, Clokie MRC, Prangishvili D, Lavigne R, Aziz RK, Duffy S, Krupovic M, Poranen MM, Knezevic P, Enault F, Tong Y, Oksanen HM, Rodney Brister J. 2018. Taxonomy of prokaryotic viruses: 2017 update from the ICTV Bacterial and Archaeal Viruses Subcommittee. *Arch Virol.* 163:1125-1129.

2. Antenucci L, Hytönen VP, Yläne J. 2018. Phosphorylated immunoreceptor tyrosine-based activation motifs and integrin cytoplasmic domains activate spleen tyrosine kinase via distinct mechanisms. *J Biol Chem.* 293:4591-4602.
3. Antila CJM, Rraklli V, Blomster HA, Dahlström KM, Salminen TA, Holmberg J, Sistonen L, Cecilia Sahlgren C. 2018. Sumoylation of Notch1 represses its target gene expression during cell stress. *Cell Death Differ.* 25:600-615.
4. Atanasova NS, Demina TA, Krishnam Rajan Shanthi SV, Oksanen HM, and Bamford DH. 2018. Extremely halophilic pleomorphic archaeal virus HRPV9 extends the diversity of pleolipoviruses with integrases. *Res Microbiol.* 169:500-504
5. Atanasova NS, Heiniö CHE, Demina T, Bamford DH, Oksanen HM. 2018. The unexplored diversity of pleolipoviruses: the surprising case of two viruses with identical major structural modules. *Genes* 9:131
6. Azinas S, Bano F, Torca I, Bamford DH, Schwartz GA, Esnaola J, Oksanen HM, Richter RP, Abrescia NG. 2018. Membrane-containing virus particles exhibit the mechanics of a composite material for genome protection. *Nanoscale* 10:7769-7779.
7. Biterova E, Esmaeeli M, Alanen HI, Saaranen M, Ruddock LW. 2018. Structures of Angptl3 and Angptl4, modulators of triglyceride levels and coronary artery disease. *Sci Rep.* 8:6752.
8. Biterova E, Ignatyev A, Uusimaa J, Hinttala R, Ruddock LW. 2018. Structural analysis of human NHLRC2, mutations of which are associated with FINCA disease. *PLoS One* 13:e0202391.
9. Brockmann SJ, Freischmidt A, Oeckl P, Müller K, Ponna SK, Helferich AM, Paone C, Reinders J, Kojer K, Orth M, Jokela M, Auranen M, Udd B, Hermann A, Danzer KM, Lichtner P, Walther P, Ludolph AC, Andersen PM, Otto M, Kursula P, Just S, Weishaupt JH. 2018. CHCHD10 mutations p.R15L and p.G66V cause motoneuron disease by haploinsufficiency. *Hum Mol Genet.* 27:706-715.
10. Carvalho LL, Elovaara H, de Ruyck J, Vergoten G, Jalkanen S, Guédez G, Salminen TA. 2018. Mapping the interaction site and effect of the Siglec-9 inflammatory biomarker on human primary amine oxidase. *Sci Rep.* 8:2086.
11. Chronopoulou EG, Papageorgiou AC, Ataya F, Nianiou-Obeidat I, Madesis P, Labrou NE. 2018. Expanding the plant GSTome through directed evolution: DNA shuffling for the generation of new synthetic enzymes with engineered catalytic and binding properties. *Front Plant Sci.* 9:1737.
12. Domanska A, Flatt JW, Jukonen JJJ, Geraets JA, Butcher SJ. 2018. A 2.8-Å resolution cryo-EM structure of human parechovirus 3 in complex with Fab from a neutralizing antibody. *BioRxiv* doi: <https://doi.org/10.1101/410217>
13. Duyvesteyn HME, Ginn HM, Pietilä MK, Wagner A, Hattne J, Grimes JM, Hirvonen E, Evans G, Parsy M-L, Sauter NK, Brewster AS, Huiskonen JT, Stuart DI, Sutton G, Dennis H, Bamford DH. 2018. Towards in cellulo virus crystallography. *Sci. Rep.* 8:3771.
14. Eskelin K, Poranen MM. 2018. Controlled disassembly and purification of functional viral subassemblies using asymmetrical flow field-flow fractionation (AF4). *Viruses* 10:579
15. Edqvist J, Blomqvist K, Nieuwland J, Salminen TA. 2018. Plant lipid transfer proteins: are we finally closing in on these enigmatic proteins. *J Lipid Res.* 59:1374-1382
16. Gludovacz E, Maresch D, Lopes de Carvalho L, Puxbaum V, Baier LJ, Sützl L, Guédez G, Grünwald-Gruber C, Ulm B, Pils S, Ristl R, Altmann F, Jilma B, Salminen TA, Borth N, Boehm T. 2018. Oligomannosidic glycans at Asn-110 are essential for secretion of human diamine oxidase. *J Biol Chem.* 293:1070-1087.
17. Haataja S, Verma P, Fu O, Papageorgiou AC, Pöysti S, Pieters RJ, Nilsson UJ, Finne J. 2018. Rationally designed chemically modified glycodendrimer inhibits *Streptococcus suis* adhesin SadP at picomolar concentrations. *Chemistry* 24:1905-1912.

18. Hackenberg C, Hakanpää J, Cai F, Antonyuk S, Eigner C, Meissner S, Laitaoja M, Jänis J, Kerfeld CA, Dittmann E, Lamzin VS. 2018. Structural and functional insights into the unique CBS-CP12 fusion protein family in cyanobacteria. *Proc Natl Acad Sci U S A*. 115:7141-7146.
19. Haikarainen T, Maksimainen M, Obaji E, Lehtiö L. 2018. Development of a screening assay for mono-ADP-ribosyl hydrolyzing macrodomains using AlphaScreen technology. *SLAS Disc*. 23:255-263.
20. Haining AWM, Rahikainen R, Cortes E, Lachowski D, Rice A, von Essen M, Hytönen VP, Del Río Hernández A. 2018. Mechanotransduction in talin through the interaction of the R8 domain with DLC1. *PLoS Biol*. 16:e2005599.
21. Harrus D, Khoder-Agha F, Peltoniemi M, Hassinen A, Ruddock L, Kellokumpu S, Glumoff T. 2018. The dimeric structure of wild-type human glycosyltransferase B4GalT1. *PLoS One*. 3:e0205571.
22. Hepojoki J, Hepojoki S, Smura T, Szirovicza L, Dervas E, Prähauser B, Nufer L, Schraner EM, Vapalahti O, Kipar A, Hetzel U. 2018. Characterization of Haartman Institute snake virus-1 (HISV-1) and HISV-like viruses-The representatives of genus hartmanivirus, family Arenaviridae. *PLoS Pathog*. 14:e1007415.
23. iNEXT Consortium. 2018. iNEXT: a European facility network to stimulate translational structural biology. *FEBS Lett*. 592:1909-1917.
24. Karki S, Paudel P, Sele C, Skhumatov AV, Kajander T. 2018. The structure of SALM5 suggests a dimeric assembly for the presynaptic RPTP ligand recognition. *Protein Eng Des Sel*. 31:147-157.
25. Kaur I, Ruskamo S, Koivunen J, Heljasvaara R, Lackman JJ, Izzi V, Petäjä-Repo UE, Kursula P, Pihlajaniemi T. 2018. The N-terminal domain of unknown function (DUF959) in collagen XVIII is intrinsically disordered and highly O-glycosylated. *Biochem J*. 475:3577-3593.
26. King AWT, Mäkelä V, Kedzior SA, Laaksonen T, Partl GJ, Heikkinen S, Koskela H, Heikkinen HA, Holding AJ, Cranston ED, Kilpeläinen I. 2018. Liquid-state NMR analysis of nanocelluloses. *Biomacromolecules*. 19:2708-2720.
27. Koskela MM, Dahlström KM, Goñi G, Lehtimäki N, Nurmi M, Velazquez-Campoy A, Hanke G, Bölter B, Salminen TA, Medina M, Mulo P. 2018. Arabidopsis FNRL protein is an NADPH-dependent chloroplast oxidoreductase resembling bacterial ferredoxin-NADP⁺ reductases. *Physiol Plant*. 162(2):177-190.
28. Kotila T, Kogan K, Enkavi G, Guo S, Vattulainen I, Goode BL, Lappalainen P. 2018. Structural basis of actin monomer re-charging by cyclase-associated protein. *Nat Commun*. 9:1892.
29. Laitinen OH, Svedin E, Kapell S, Hankaniemi MM, Larsson PG, Domsgen E, Stone VM, Määttä JAE, Hyöty H, Hytönen VP, Flodström-Tullberg M. 2018. New coxsackievirus 2A^{pro} and 3C^{pro} protease antibodies for virus detection and discovery of pathogenic mechanisms. *J Virol Methods*. 255:29-37.
30. Lampi M, Oksanen HM, Meier F, Moldenhauer E, Poranen MM, Bamford DH, and Eskelin K. 2018. Asymmetrical flow field-flow fractionation in purification of an enveloped bacteriophage ϕ 6. *J Chrom B*. 1095: 251-257.
31. Laulumaa S, Nieminen T, Raasakka A, Krokengen OC, Safaryan A, Hallin EI, Brysbaert G, Lensink MF, Ruskamo S, Vattulainen I, Kursula P. 2018. Structure and dynamics of a human myelin protein P2 portal region mutant indicate opening of the β barrel in fatty acid binding proteins. *BMC Struct Biol*. 18:8.
32. Leigh B, Breitbart M, Oksanen HM, Bamford DH, Dishaw L. 2018. Genome sequence of PM2-like phage Cr39582 induced from *Pseudoalteromonas* sp. isolated from the gut of *Ciona robusta*. *Genome Announc*. 6:e00368-18.
33. Levanova A, Poranen MM. 2018. Application of steric exclusion chromatography on monoliths for separation and purification of RNA molecules. *J Chrom A*. 1574:50-59.

34. Li DC, Papageorgiou AC. 2018. Cellulases from thermophilic fungus: Structural and functional insights. In 'Fungi in extreme environments: Ecological and biotechnological significance', Springer Publishers, ed. S. Tiquia-Arashiro
35. Luhtanen AM, Eronen-Rasimus E, Oksanen HM, Tison J-L, Delille B, Dieckmann G, Rintala J-M, Bamford DH. 2018. The first known virus isolates from Antarctic sea ice have complex infection patterns. *FEMS Microbiol Ecol.* 94:fiy028.
36. Medarametla P, Gatta V, Kajander T, Laitinen T, Tammela P, Poso A. 2018. Structure-based virtual screening of LsrK kinase inhibitors to target quorum sensing. *ChemMedChem.* 2018 13:2400-2407.
37. Millerioux Y, Mazet M, Bouyssou G, Allmann S, Kiema TR, Bertiaux E, Fouillen, L, Thapa C, Biran M, Plazolles N, Dittrich-Domergue F, Cruzols A, Wierenga RK, Rotureau B, Moreau P, Bringaud F. 2018. De novo biosynthesis of sterols and fatty acids in the *Trypanosoma brucei* procyclic form: carbon source preferences and metabolic flux redistributions. *PLoS Pathog.* 14:e1007116.
38. Mikula KM, Krumwiede L, Plückthun A, Iwai H. 2018. Segmental isotopic labeling by asparaginyl endopeptidase-mediated protein ligation. *J Biomol NMR.* 71:225-235.
39. Murthy AV, Sulu R, Koski MK, Tu H, Anantharajan J, Sah-Teli SK, Myllyharju J, Wierenga RK. 2018. Structural enzymology binding studies of the peptide-substrate-binding domain of human collagen prolyl 4-hydroxylase (type-II): High affinity peptides have a PxGP sequence motif. *Protein Sci.* 27:1692-1703.
40. Murthy S, Desantis J, Verheugd P, Maksimainen MM, Venkannagari H, Massari S, Ashok Y, Obaji E, Nkizinkiko Y, Lüscher B, Tabarrini O, Lehtiö L. 2018. 4-(Phenoxy) and 4-(benzyloxy)benzamides as potent and selective inhibitors of mono-ADP-ribosyltransferase PARP10/ARTD10. *Eur J Med Chem.* 156:93-102.
41. Myllykoski M, Eichel MA, Jung RB, Kelm S, Werner HB, Kursula P. 2018. High-affinity heterotetramer formation between the large myelin-associated glycoprotein and the dynein light chain DYNLL1. *J Neurochem.* 147:764-783.
42. Nguyen VD, Biterova E, Salin M, Wierenga RK, Ruddock LW. 2018. Crystal structure of human anterior gradient protein 3. *Acta Crystallogr F Struct Biol Commun.* 74(Pt 7):425-430.
43. Niehl A, Soininen M, Poranen MM, Heinlein M. 2018. Synthetic biology approach for plant protection using dsRNA. *Plant Biotechnol J.* 16(9): 1679-1687.
44. Nkizinkiko Y, Desantis J, Koivunen J, Haikarainen T, Murthy S, Sancineto L, Massari S, Ianni F, Obaji E, Loza MI, Pihlajaniemi T, Brea J, Tabarrini O, Lehtiö L. 2018. 2-Phenylquinazolinones as dual-activity tankyrase-kinase inhibitors. *Sci. Rep.* 8:1680.
45. Norppa AJ, Kauppala TM, Heikkinen HA, Verma B, Iwai H, Frilander MJ. 2018. Mutations in the U11/U12-65K protein associated with isolated growth hormone deficiency lead to structural destabilization and impaired binding of U12 snRNA. *RNA.* 24:396-409.
46. Obaji E, Haikarainen T, Lehtiö L. 2018. Structural basis for DNA break recognition by ARTD2/PARP2. *Nucleic Acids Res.* 46:12154-12165.
47. Oeemig JS, Ollila OHS, Iwai H. 2018. NMR structure of the C-terminal domain of TonB protein from *Pseudomonas aeruginosa*. *PeerJ* 6:e5412.
48. Ojanen MJT, Uusi-Mäkelä MIE, Harjula SE, Saralahti AK, Oksanen KE, Kähkönen N, Määttä JAE, Hytönen VP, Pesu M, Rämetsä M. 2018. Intelectin 3 is dispensable for resistance against a mycobacterial infection in zebrafish (*Danio rerio*). *Sci Rep.* 9:995
49. Ollila OHS, Heikkinen HA, Iwai H. 2018. Rotational dynamics of proteins from spin relaxation times and molecular dynamics simulations. *J. Phys. Chem.* 122: 6559-6569.
50. Penttinen L, Rutanen C, Jänis J, Rouvinen J, Hakulinen N. 2018. Unraveling substrate specificity and catalytic promiscuity of *Aspergillus oryzae* catechol oxidase. *Chembiochem.* 19:2348-2352.

51. Penttinen L, Rutanen C, Saloheimo M, Kruus K, Rouvinen J, Hakulinen N. 2018. A new crystal form of *Aspergillus oryzae* catechol oxidase and evaluation of copper site structures in coupled binuclear copper enzymes. *PLoS One*. 13:e0196691.
52. Pietilä MK, van Hemert MJ, Ahola T. 2018. Purification of highly active alphavirus replication complexes demonstrates altered fractionation of multiple cellular membranes. *J Virol*. 92:e01852-17.
53. Ponna SK, Myllykoski M, Kursula P. 2018. Crystallographic home-source X-ray data for the atomic-resolution experimental phasing of the Shank3 SH3 domain structure from pseudomerohedrally twinned crystals. *Data Brief*. 20:1912-1916.
54. Ponna SK, Ruskamo S, Myllykoski M, Keller C, Boeckers TM, Kursula P. 2018. Structural basis for PDZ domain interactions in the post-synaptic density scaffolding protein Shank3. *J Neurochem*. 145:449-463.
55. Pulkkinen L. 2018. Kryoelektronimikroskopia mullistaa molekyylibiologian. *Natura* 1/18:30-33
56. Rahman MM, Andberg M, Koivula A, Rouvinen J, Hakulinen N. 2018. The crystal structure of D-xylonate dehydratase reveals functional features of enzymes from the Ilv/ED dehydratase family. *Sci Rep*. 8:865
57. Saarinen NVV, Laiho JE, Richardson SJ, Zeissler M, Stone VM, Marjomäki V, Kantoluoto T, Horwitz MS, Sioofy-Khojine A, Honkimaa A, Hankaniemi MM, Flodström-Tullberg M, Hyöty H, Hytönen VP, Laitinen OH. 2018. A novel rat CVB1-VP1 monoclonal antibody 3A6 detects a broad range of enteroviruses. *Sci Rep*. 8:33.
58. Salminen TA, Eklund DM, Joly V, Blomqvist K, Matton DP, Edqvist J. 2018. Deciphering the evolution and development of the cuticle by studying lipid transfer proteins in mosses and liverworts. *Plants* 7:6.
59. Shakeel, S., Evans, J.D., Hazelbaker, M., Kao, C. C., Vaughan, R.C., Butcher, S.J. 2018. Intrinsically-disordered N-termini in human parechovirus 1 capsid proteins bind encapsidated RNA. *Sci Rep*. 8:5820.
60. Shao D, Tapio K, Auer S, Toppari JJ, Hytönen VP, Ahlskog M. 2018. Surface characteristics control the attachment and functionality of (chimeric) avidin. *Langmuir*. 34:15335-15342.
61. Shiraishi Y, Natsume M, Kofuku Y, Imai S, Nakata K, Mizukoshi T, Ueda T, Iwai H, Shimada I. 2018. Phosphorylation-induced conformation of β 2-adrenoceptor related to arrestin recruitment revealed by NMR. *Nat Commun*. 9:194.
62. Sipilä KH, Drushinin K, Rappu P, Jokinen J, Salminen TA, Salo AM, Käpylä J, Myllyharju J, Heino J. 2018. Proline hydroxylation in collagen supports integrin binding by two distinct mechanisms. *J Biol Chem*. 293:7645-7658.
63. Stone VM, Hankaniemi MM, Svedin E, Sioofy-Khojine A, Oikarinen S, Hyöty H, Laitinen OH, Hytönen VP, Flodström-Tullberg M. 2018. A coxsackievirus B vaccine protects against virus-induced diabetes in an experimental mouse model of type 1 diabetes. *Diabetologia*. 61:476-481.
64. Sun X, Ilca SL, Huiskonen JT, Poranen MM. 2018. Dual role of a viral polymerase in viral genome replication and particle self-assembly. *mBio*. 9: e01242-18.
65. Tapio K, Shao D, Auer S, Tuppurainen J, Ahlskog M, Hytönen VP, Toppari JJ. 2018. A DNA-nanoparticle actuator enabling optical monitoring of nanoscale movements induced by an electric field. *Nanoscale*. 10:19297-19309.
66. Tossavainen H, Raulinaitis V, Kauppinen L, Pentikäinen U, Maaheimo H, Permi P. 2018. Structural and functional insights into lysostaphin-substrate interaction. *Front Mol Biosci*. 5:60.
67. Yang D, Viitasuo M, Pooch F, Tenhua H, Hietala S. 2018. Poly(N-acryloylglycinamide) microgels as nanocatalyst platform. *Polym. Chem*. 9: 517-524.

68. Zhang Y, Jumppanen M, Maksimainen MM, Auno S, Awol Z, Ghemtio L, Venkannagari H, Lehtiö L, Yli-Kauhaluoma J, Xhaard H, Boije Af Gennäs G. 2018. Adenosine analogs bearing phosphate isosteres as human MDO1 ligands. *Bioorg Med Chem.* 26:1588-1597.

2017

1. Adriaenssens EM, Krupovic M, Knezevic P, Ackermann HW, Barylski J, Brister JR, Clokie MR, Duffy S, Dutilh BE, Edwards RA, Enault F, Jang HB, Klumpp J, Kropinski AM, Lavigne R, Poranen MM, Prangishvili D, Rumnieks J, Sullivan MB, Wittmann J, Oksanen HM, Gillis A, Kuhn JH. 2017. Taxonomy of prokaryotic viruses: 2016 update from the ICTV bacterial and archaeal viruses subcommittee. *Arch Virol.*162:1153-1157
2. Agrawal N, Määttä JAE, Kulomaa MS, Hytönen VP, Johnson MS, Airenne TT. 2017. Structural characterization of core-bradavidin in complex with biotin. *PLoS One.* 2:e0176086.
3. Ahlstrand T, Tuominen H, Beklen A, Torittu A, Oscarsson J, Sormunen R, Pöllänen MT, Permi P, Ihalin R. 2017. A novel intrinsically disordered outer membrane lipoprotein of *Aggregatibacter actinomycetemcomitans* binds various cytokines and plays a role in biofilm response to interleukin-1 β and interleukin-8. *Virulence* 8:115-134.
4. Anastasina M, Domanska A, Palm K, Butcher S. 2017. Human picornaviruses associated with neurological diseases and their neutralization by antibodies. *J Gen Virol.* 98:1145-1158.
5. Anumala UR, Waaler J, Nkizinkiko Y, Ignatev A, Lazarow K, Lindemann P, Olsen PA, Murthy S, Obaji E, Majouga AG, Leonov S, von Kries JP, Lehtiö L, Krauss S, Nazaré M. 2017. Discovery of a novel series of tankyrase inhibitors by a hybridization approach. *J Med Chem.* 60:10013-10025.
6. Iwaï H, Aranko AS. 2017. Protein ligation by HINT domains, in *Chemical Ligation: Tools for Biomolecule Synthesis and Modification* (eds L. D. D'Andrea and A. Romanelli), John Wiley & Sons, Inc., Hoboken, NJ, USA. p. 421-445.
7. Iwaï H, Mikula KM, Oeemig JS, Zhou D, Li M, Wlodawer A. 2017. Structural basis for the persistence of homing endonucleases in transcription factor IIB inteins. *J Mol Biol.* 429:3942-3956
8. Axarli I, Muleta AW, Chronopoulou EG, Papageorgiou AC, Labrou NE. 2017. Directed evolution of glutathione transferases towards a selective glutathione-binding site and improved oxidative stability. *Bioch Biophys Acta Gen Sub* 1861:3416-3428
9. Auer S, Azizi L, Faschinger F, Blazevic V, Vesikari T, Gruber HJ, Hytönen VP. 2017. Stable immobilisation of His-tagged proteins on BLI biosensor surface using cobalt. *Sensors and Actuators B: Chemical.* 243:104-113.
10. Bamford DH, Pietilä MK, Roine E, Atanasova NS, Dienstbier A, Oksanen HM and ICTV Report Consortium. 2017. ICTV Virus Taxonomy Profile: Pleolipoviridae. *J. Gen. Virol.* 98:2916-2917.
11. Carvalho LL, Salminen TA, Dahlström KM. 2017. Slr0006-like proteins: A TsaC/TsaC2/YciO subfamily exclusive to cyanobacteria. *Mol Phylogenet Evol.* 109:1-10.
12. Chatzikonstantinou M, Vlachakis D, Papageorgiou L, Papageorgiou AC, Labrou NE. 2017. The glutathione transferase family of *Chlamydomonas reinhardtii*: identification and characterization of novel sigma class-like enzymes. *Algal Research* 24, 237–250.
13. Coloma SE, Dienstbier A, Bamford DH, Sivonen K, Roine E, Hiltunen T. 2017. Newly isolated *Nodularia* phage influences cyanobacterial community dynamics. *Environ Microbiol.* 19:273-286.
14. Chu Y, Tu T, Penttinen L, Xue X, Wang X, Yi Z, Gong L, Rouvinen J, Luo H, Hakulinen N, Yao B, Su X. 2017. Insights into the roles of non-catalytic residues in the active site of a GH10 xylanase with activity on cellulose. *J Biol Chem.* 292:19315-19327.
15. Demina TA, Pietilä MK, Svirskaitė J, Ravantti JJ, Atanasova NS, Bamford DH, Oksanen HM. 2017. HCIV-1 and other tailless icosahedral internal membrane-containing viruses of the family Sphaerolipoviridae. *Viruses.* 9:e32

16. Eskelin K, Lampi M, Meier F, Moldenhauer E, Bamford DH, Oksanen HM. 2017. Halophilic viruses with varying biochemical and biophysical properties are amenable to purification with asymmetric flow field flow fractionation. *Extremophiles* 21:1119-1132
17. Haikarainen T, Schlesinger M, Obaji E, Fernández Villamil SH, Lehtiö L. 2017. Structural and biochemical characterization of poly-ADP-ribose polymerase from *Trypanosoma brucei*. *Sci Rep.* 7:3642.
18. Han H, Kursula P. 2017. Crystallographic anomalous diffraction data for the experimental phasing of two myelin proteins, gliomedin and periaxin. *Data Brief.* 11:552-556.
19. Hanhijärvi KJ, Ziedaite G, Bamford DH, Hægström E, Poranen MM. 2017. Single-molecule measurements of viral ssRNA packaging. *RNA* 23:119-129.
20. Hankaniemi MM, Laitinen OH, Stone VM, Sioofy-Khojine A, Määttä JAE, Larsson PG, Marjomäki V, Hyöty H, Flodström-Tullberg M, Hytönen VP. 2017. Optimized production and purification of Coxsackievirus B1 vaccine and its preclinical evaluation in a mouse model. *Vaccine.* 35:3718-3725.
21. Harijan RK, Kiema TR, Syed SM, Qadir I, Mazet M, Bringaud F, Michels PAM, Wierenga RK. 2017. Crystallographic substrate binding studies of *Leishmania mexicana* SCP2-thiolase (type-2): unique features of oxyanion hole-1. *Protein Eng Des Sel.* 30: 225–233.
22. Kalliokoski S, Piqueras VO, Frías R, Sulic AM, Määttä JA, Kähkönen N, Viiri K, Huhtala H, Pasternack A, Laurila K, Sblattero D, Korponay-Szabó IR, Mäki M, Caja S, Kaukinen K, Lindfors K. 2017. Transglutaminase 2-specific coeliac disease autoantibodies induce morphological changes and signs of inflammation in the small-bowel mucosa of mice. *Amino Acids.* 49:529-540.
23. Kasaragod P, Midekessa GB, Sridhar S, Schmitz W, Kiema TR, Hiltunen JK, Wierenga RK. 2017. Structural enzymology comparisons of multifunctional enzyme, type-1 (MFE1): the flexibility of its dehydrogenase part. *FEBS Open Bio.* 7:1830-1842.
24. Kellici TF, Mavromoustakos T, Jendrossek D, Papageorgiou AC. 2017. Crystal structure analysis, covalent docking and molecular dynamics calculations reveal a conformational switch in PhaZ7 PHB depolymerase. *Proteins* 85:1351-1361.
25. Karelehto, E., van der Sanden, S., Geraets, J.A., Domanska, A., van der Linden, L., Hoogendoorn, D., Koen, G., van Eijk, H., Shakeel, S., Beaumont, T., de Jong, M., Pajkrt, D., Butcher, S.J., Wolthers, K.C. 2017. Strain-dependent neutralization reveals antigenic variation of human parechovirus 3. *Sci Rep* 7:12075
26. Kolodziejczyk R, Mikula KM, Kotila T, Postis VLG, Jokiranta TS, Goldman A, Meri T. 2017. Crystal structure of a tripartite complex between C3dg, C-terminal domains of factor H and OspE of *Borrelia burgdorferi*. *PLoS One.* 12:e0188127.
27. Koski, M.K., Anantharajan, J., Kursula, P., Dhavala, P., Murthy, A.V., Bergmann, U., Myllyharju, J., Wierenga, R.K. 2017. Assembly of the elongated collagen prolyl 4-hydroxylase $\alpha(2)\beta(2)$ heterotetramer around a central $\alpha(2)$ dimer. *Biochem J.* 474:751-769.
28. Laitaoja M, Isoniemi S, Valjakka J, Mandity M & Jänis J. 2017. Deciphering metal ion preference and primary coordination sphere robustness of a designed zinc finger with high-resolution mass spectrometry. *Protein Sci.* 26:198.
29. Leppänen VM, Saharinen P, Alitalo K. Structural basis of Tie2 activation and Tie2/Tie1 heterodimerization. 2017. *Proc Natl Acad Sci U S A.* 114:4376-4381.
30. Minato Y, Ueda T, Machiyama A, Iwai H, Shimada I. 2017. Dynamic domain arrangement of CheA-CheY complex regulates bacterial chemotaxis, as revealed by NMR. *Sci Rep.* 7:16462.
31. Mikula, K. M., Tascón, I., Tommila, J. J., Iwai, H. 2017. Segmental isotopic labeling of a single-domain globular protein without any refolding step by an asparaginyl endopeptidase. *FEBS Lett.* 591:1285–1294.

32. Muruganandam G, Raasakka A, Myllykoski M, Kursula I, Kursula P. 2017. Structural similarities and functional differences clarify evolutionary relationships between tRNA healing enzymes and the myelin enzyme CNPase. *BMC Biochem.* 18:7.
33. Myllykoski M, Baumann A, Hensley K, Kursula P. 2017. Collapsin response mediator protein 2: high-resolution crystal structure sheds light on small-molecule binding, post-translational modifications, and conformational flexibility. *Amino Acids.* 49:747-759.
34. Myllykoski M, Kursula P. 2017. Structural aspects of nucleotide ligand binding by a bacterial 2H phosphoesterase. *PLoS One.* 12:e0170355.
35. Nathubhai A, Haikarainen T, Koivunen J, Murthy S, Koumanov F, Lloyd MD, Holman GD, Pihlajaniemi T, Tosh D, Lehtiö L, Threadgill MD. 2017. Highly potent and isoform-selective dual-site-binding tankyrase/Wnt signaling inhibitors that increase cellular glucose uptake and have anti-proliferative activity. *J. Med. Chem.* 60:814-820.
36. Oksanen HM, ICTV Report Consortium. 2017. ICTV Virus Taxonomy Profile: Corticoviridae. *J Gen Virol.* 98:888-889.
37. Otrusínová O, Demo G, Padrta P, Jaseňáková Z, Pekárová B, Gelová Z, Szmitkowska A, Kadeřávek P, Jansen S, Zachrdla M, Klumpler T, Marek J, Hritz J, Janda L, Iwaï H, Wimmerová M, Hejátko J, Žídek L. 2017. Conformational dynamics are a key factor in signaling mediated by the receiver domain of a sensor histidine kinase from *Arabidopsis thaliana*. *J. Biol. Chem.* 292: 17525-17540.
38. Papageorgiou AC, Chen J, Li DC. 2017. Crystal structure and biological implications of a glycoside hydrolase family 55 β -1,3-glucanase from *Chaetomium thermophilum*. *Biochim Biophys Acta.* 1865:1030-1038.
39. Patrikainen MS, Tolvanen MEE, Aspatwar A, Barker HR, Ortutay C, Jänis J, Laitaoja M, Hytönen VP, Azizi L, Manandhar P, Jáger E, Vullo D, Kukkurainen S, Hilvo M, Supuran CT, Parkkila S. 2017. Identification and characterization of a novel zebrafish (*Danio rerio*) pentraxin-carbonic anhydrase. *PeerJ.* 5:e4128.
40. Perveen, S., Rashid, N., Tang, X.-F., Imanaka, T. Papageorgiou, A. C. 2017. Anthranilate phosphoribosyltransferase from the hyperthermophilic archaeon *Thermococcus kodakarensis* shows maximum activity with zinc and forms a unique dimeric structure *FEBS Open Bio.* 7:1217-1230
41. Pietilä MK, Albuлесcu IC, Hemert MJV, Ahola T. 2017. Polyprotein processing as a determinant for in vitro activity of Semliki Forest virus replicase. *Viruses.* 9:10.
42. Piirainen H, Taura J, Kursula P, Ciruela F, Jaakola VP. 2017. Calcium modulates calmodulin/ α -actinin 1 interaction with and agonist-dependent internalization of the adenosine A(2A) receptor. *Biochim Biophys Acta.* 1864:674-686.
43. Ponna SK, Myllykoski M, Boeckers TM, Kursula P. 2017. Structure of an unconventional SH3 domain from the postsynaptic density protein Shank3 at ultrahigh resolution. *Biochem Biophys Res Commun.* 490:806-812.
44. Pothipongsa A, Jantaro S, Salminen TA, Incharoensakdi A. 2017. Molecular characterization and homology modeling of spermidine synthase from *Synechococcus* sp. PCC 7942. *World Journal of Microbiology and Biotechnology.* 33:72.
45. Prangishvili D, Bamford DH, Forterre P, Iranzo J, Koonin EV, Krupovic M. 2017. The enigmatic archaeal virosphere. *Nat Rev Microbiol.* 15:724-739.
46. Raasakka A, Ruskamo S, Kowal J, Barker R, Baumann A, Martel A, Tuusa J, Myllykoski M, Bürck J, Ulrich AS, Stahlberg H, Kursula P. 2017. Membrane association landscape of myelin basic protein portrays formation of the myelin major dense line. *Sci Rep.* 7:4974.
47. Rahman MM, Andberg M, Thangaraj SK, Parkkinen T, Penttilä M, Jänis J, Koivula A, Rouvinen J, Hakulinen N. 2017. The crystal structure of a bacterial l-arabinonate dehydratase contains a [2Fe-2S] cluster. *ACS Chem Biol* 12:1919-1927.

48. Raulinaitis V, Tossavainen H, Aitio O, Juuti JT, Hiramatsu K, Kontinen V, Permi P. 2017. Identification and structural characterization of LytU, a unique peptidoglycan endopeptidase from the lysostaphin family. *Sci Rep.* 7:6020.
49. Raulinaitis V, Tossavainen H, Aitio O, Seppälä R, Permi P. 2017. ¹H, ¹³C and ¹⁵N resonance assignments of the new lysostaphin family endopeptidase catalytic domain from *Staphylococcus aureus*. *Biomol NMR Assign* 11:69-73.
50. Ruskamo S, Nieminen T, Kristiansen CK, Vatne GH, Baumann A, Hallin EI, Raasakka A, Joensuu P, Bergmann U, Vattulainen I, Kursula P. 2017. Molecular mechanisms of Charcot-Marie-Tooth neuropathy linked to mutations in human myelin protein P2. *Sci Rep.* 7:6510.
51. Russo G, Witos J, Rantamäki AH, Wiedmer SK. 2017. Cholesterol affects the interaction between an ionic liquid and phospholipid vesicles. A study by differential scanning calorimetry and nanoplasmonic sensing. *Biochim Biophys Acta.* 1859:2361-2372.
52. Sahlgrén C, Meinander A, Zhang H, Cheng F, Preis M, Xu C, Salminen TA, Toivola D, Abankwa D, Rosling A, Karaman DŞ, Salo-Ahen OMH, Österbacka R, Eriksson JE, Willför S, Petre I, Peltonen J, Leino R, Johnson M, Rosenholm J, Sandler N. 2017. Tailored approaches in drug development and diagnostics: from molecular design to biological model systems. *Adv Healthc Mater.* 6: 1700258.
53. Samasil K, Lopes de Carvalho L, Mäenpää P, Salminen TA, Incharoensakdi A. 2017. Biochemical characterization and homology modeling of polyamine oxidase from cyanobacterium *Synechocystis* sp. PCC 6803. *Plant Physiol Biochem.* 119:159-169.
54. Santos-Pérez I, Oksanen HM, Bamford DH, Goñi FM, Reguera D, Abrescia NG. 2017. Membrane-assisted viral DNA ejection. *Biochim Biophys Acta.* 1861:664-672.
55. Skopelitou K, Muleta AW, Papageorgiou AC, Pavli O, Flemetakis E, Skaracis G.N, Labrou NE. 2017. Characterization and functional analysis of a recombinant Tau-class glutathione transferase GmGSTU2-2 from *Glycine max*. *Intern J. Biol. Macromol.* 94:802-812
56. Shakeel S, Dykeman EC, White SJ, Ora A, Cockburn JJB, Butcher SJ, Stockley PG, Twarock R. 2017. Genomic RNA folding mediates assembly of human parechovirus. *Nat Commun.* 8:5.
57. Sinclair RM, Ravantti JJ, Bamford DH. 2017. Nucleic and amino acid sequences support structure-based viral classification. *J Virol.* 91:e02275-16.
58. Snaidero N, Velte C, Myllykoski M, Raasakka A, Ignatev A, Werner HB, Erwig MS, Möbius W, Kursula P, Nave KA, Simons M. 2017. Antagonistic functions of MBP and CNP establish cytosolic channels in CNS myelin. *Cell Rep.* 18:314-323.
59. Sun Z, El Omari K, Sun X, Ilca SL, Kotecha A, Stuart DI, Poranen MM, Huiskonen JT. 2017. Double-stranded RNA virus outer shell assembly by bona fide domain-swapping. *Nat Commun.* 8:14814
60. Szambowska A, Tessmer I, Prus P, Schlott B, Pospiech H, Grosse F. 2017. Cdc45-induced loading of human RPA onto single-stranded DNA. *Nucleic Acids Res.* 45:3217-3230.
61. Tuusa J, Raasakka A, Ruskamo S, Kursula P. 2017. Myelin-derived and putative molecular mimic peptides share structural properties in aqueous and membrane-like environments. *Mult. Scler. Demyelinating Disord.* 2:4.
62. Wierenga RK, Ringe D. 2017. The EMBO biocatalysis conference "The biochemistry and chemistry of biocatalysis: from understanding to design". *Protein Eng Des Sel.* 30:141.

2016

1. Andberg M, Aro-Kärkkäinen N, Carlson P, Oja M, Bozonnet S, Toivari M, Hakulinen N, O'Donohue M, Penttilä M & Koivula A. (2016). Characterization and mutagenesis of two novel iron-sulphur cluster pentonate dehydratases. *Appl. Microbiol. Biotechnol.* 100:7549-7563.
2. Atanasova NS, Bamford DH, Oksanen HM. (2016). Virus-host interplay in high salt environments. *Environmental microbiology reports. Environ Microbiol Rep.* 8(4):431-44.

3. Axarli, I., Muleta, A.W., Vlachakis, D., Kossida, S., Kotzia, G., Maltezos, A., Dhavala, P., Papageorgiou, A.C & Labrou, N.E. (2016). Directed evolution of tau class glutathione transferases reveals a site that regulates catalytic efficiency and masks cooperativity. *Biochem. J.* 473, 559-570
4. Batchu KC, Hänninen S, Jha SK, Jeltsch M, Somerharju P. (2016). Factors regulating the substrate specificity of cytosolic phospholipase A2-alpha in vitro. *BBA-Mol Cell Biol L.* 1861(11):1597–604.
5. Blazevits, O., Mideksa, Y.G., Solman, M., Ligabue, A., Ariotti, N., Nakhaeizadeh, H., Eyad Fansa, E., Papageorgiou, A.C., Wittinghofer, A., Ahmadian, R.M., Parton, R.G. & Abankwa, D. (2016). Galectin-1 dimers can scaffold Raf-effectors to increase H-ras nanoclustering. *Sci. Reports* 6:24165
6. Bosma M, Gerling M, Pasto J, Georgiadi A, Graham E, Shilkova O, Iwata Y, Almer S, Söderman J, Toftgård R, Wermeling F, Boström EA, Boström PA. (2016). FNDC4 acts as an anti-inflammatory factor on macrophages and improves colitis in mice. *Nat Commun.* 7:11314.
7. Ciragan, A., Aranko, A.S., Tascon, I. & Iwai, H. (2016) Salt-inducible protein splicing in cis and trans by inteins from extremely halophilic archaea as a novel protein-engineering tool. *J. Mol. Bio* 428:4573-4588.
8. Dashkevich A, Raissadati A, Syrjälä SO, Zarkada G, Keränen MAI, Tuuminen R, et al. (2016). Ischemia-Reperfusion Injury Enhances Lymphatic Endothelial VEGFR3 and Rejection in Cardiac Allografts: Lymphatic Endothelial VEGFR3 Controls Rejection. *Am J Transplant.* 16(4):1160–72.
9. Demina TA, Atanasova NS, Pietilä MK, Oksanen HM, Bamford DH. (2016). Vesicle-like virion of *Haloarcula hispanica* pleomorphic virus 3 preserves high infectivity in saturated salt. *Virology* 499:40-51.
10. Demina TA, Pietilä MK, Svirskaitė J, Ravantti JJ, Atanasova NS, Bamford DH, Oksanen HM. (2016). Archaeal virus HCIV-1 highlights conserved elements in icosahedral membrane-containing DNA viruses from extreme environments. *mBio* 19;7(4). pii: e00699-16.
11. Elovaara H, Parkash V, Fair-Mäkelä R, Salo-Ahen OM, Guédez G, Bligt-Lindén E, Grönholm J, Jalkanen S, Salminen TA. (2016) Multivalent Interactions of Human Primary Amine Oxidase with the V and C22 Domains of Sialic Acid-Binding Immunoglobulin-Like Lectin-9 Regulate Its Binding and Amine Oxidase Activity. *PLoS One.* 2 11(11):e0166935
12. Eskelin K, Lampi M, Meier F, Moldenhauer E, Bamford DH, Oksanen HM. (2016). Asymmetric flow field flow fractionation methods for virus purification. *J Chromatogr A.* 1469:108-119.
13. Haikarainen T, Lehtiö L. (2016). Proximal ADP-ribose Hydrolysis in Trypanosomatids is Catalyzed by a Macrodomain. *Sci. Rep.* 6:24213.
14. Haikarainen T, Waaler J, Ignatev A, Nkizinkiko Y, Venkannagari H, Obaji, E, Krauss S, Lehtiö L. (2016). Development and structural analysis of adenosine site binding tankyrase inhibitors. *Bioorg. Med. Chem. Lett.* 26:328-333.
15. Hanhijärvi KJ, Ziedaite G, Hæggström E, Bamford DH. (2016). Temperature and pH dependence of DNA ejection from archaeal lemon-shaped virus His1. *Eur Biophys J.* 45(5):435-42.
16. Harijan RK, Mazet M, Kiema TR, Bouyssou G, Alexson SE, Bergmann U, Moreau P, Michels PA, Bringaud F, Wierenga RK. (2016). The SCP2-thiolase-like protein (SLP) of *Trypanosoma brucei* is an enzyme involved in lipid metabolism. *Proteins*, 84, 1075-1096.
17. Harju K, Koskela H, Kremp A, Suikkanen S, de la Iglesia P, Miles CO, Krock B, Vanninen P. (2016). Identification of gymnodimine D and presence of gymnodimine variants in the dinoflagellate *Alexandrium ostenfeldii* from the Baltic Sea. *Toxicon*, 112 pp. 68–76
18. Hulmi JJ, Hentilä J, DeRuisseau KC, Oliveira BM, Papaioannou KG, Autio R, Kujala UM, Ritvos O, Kainulainen H, Korkmaz A, Atalay M. (2016). Effects of muscular dystrophy, exercise and blocking activin receptor IIB ligands on the unfolded protein response and oxidative stress. *Free Radic Biol Med.* 99:308-322.
19. Ivanov KI, Eskelin K, Bašić M, De S, Löhmus A, Varjosalo M, Mäkinen K. (2016). Molecular insights into the function of the viral RNA silencing suppressor HCPro. *Plant. J.* 85(1):30-45.

20. Jin, C., Viidanoja, J., Li, M., Zhang, Y., Ikonen, E., Root, A., Romanczyk, M., Manheim, J., Dziekonski, E., Kenttämää, H. I. (2016). Comparison of Atmospheric Pressure Chemical Ionization and Field Ionization Mass Spectrometry for the Analysis of Large Saturated Hydrocarbons. *Anal. Chem.* 88 (21), 10592-10598. DOI: 10.1021/acs.analchem.6b02789
21. Johns SC, Yin X, Jeltsch M, Bishop JR, Schuksz M, El Ghazal R, Wilcox-Adelman SA, Alitalo K, Fuster MM. (2016). Functional Importance of a Proteoglycan Co-Receptor in Pathologic Lymphangiogenesis. *Circ Res.* 119:210–21.
22. Jokipii-Lukkari S, Kastaniotis A, Parkash V, Sundström R, Leiva-Eriksson N, Nymalm Y, Blokhina O, Kukkola E, Fagerstedt KV, Salminen TA, Läärä E, Bülow L, Ohlmeier S, Hiltunen JK, Kallio PT Häggman H (2016). Dual targeted poplar ferredoxin NADP+ oxidoreductase interacts with hemoglobin 1. *Plant Science.* 247: 38–149.
23. Krause M, Kiema T-R, Neubauer P, Wierenga RK. (2016). Crystal structures of two monomeric TIM variants identified via a directed evolution protocol selecting for L-arabinose isomerase activity. *Acta Crystallographic F72*, 490-499.
24. Laitaoja M, Tossavainen H, Pihlajamaa T, Valjakka J, Viiri K, Lohi O, Permi P, Jänis J (2016). Redox-dependent disulfide bond formation in SAP30L corepressor protein: Implications for structure and function. *Protein Sci.* 25 572-586.
25. Lehtonen SI, Tullila A, Agrawal N, Kukkurainen S, Kähkönen N, Koskinen M, Nevanen TK, Johnson MS, Airenne TT, Kulomaa MS, Riihimäki TA, Hytönen VP. (2016). Artificial Avidin-Based Receptors for a Panel of Small Molecules. *ACS Chem Biol.* 11(1):211-21.
26. Leonhard WN, Kunnen SJ, Plugge AJ, Pasternack A, Jianu SB, Veraar K, El Bouazzaoui F, Hoogaars WM, Ten Dijke P, Breuning MH, De Heer E, Ritvos O, Peters DJ. (2016). Inhibition of Activin Signaling Slows Progression of Polycystic Kidney Disease. *J Am Soc Nephrol.* 27(12):3589-3599.
27. Leon-Velarde CG, Happonen L, Pajunen M, Leskinen K, Kropinski AM, Mattinen L, Rajtor M, Zur J, Smith D, Chen S, Nawaz A, Johnson RP, Odumeru JA, Griffiths MW, Skurnik M. (2016). *Yersinia enterocolitica*-specific infection by bacteriophages TG1 and ϕ R1-RT is dependent on temperature-regulated expression of the phage host receptor OmpF. *Appl Environ Microbiol.* 82(17):5340-53.
28. Li KM, Wilkinson C, Kellosalo J, Tsai JY, Kajander T, Jeuken LJ, Sun YJ, Goldman A. (2016). Membrane pyrophosphatases from *Thermotoga maritima* and *Vigna radiata* suggest a conserved coupling mechanism. *Nat Commun.* 7:13596.
29. Lundahl MJ, Cunha AG, Rojo E, Papageorgiou AC, Rautkari L, Arboleda JC, Rojas OJ. (2016). Strength and Water Interactions of Cellulose I Filaments Wet-Spun from Cellulose Nanofibril Hydrogels. *Sci. Rep.* 6:30695
30. Meriläinen G, Koski MK, Wierenga RK. (2016). The extended structure of the periplasmic region of CdsD, a structural protein of the type III secretion system of *Chlamydia trachomatis*. *Protein Sci.* 25:987-998.
31. Myllykoski M, Seidel L, Muruganandam G, Raasakka A, Torda AE, Kursula P. (2016). Structural and functional evolution of 2',3'-cyclic nucleotide 3'-phosphodiesterase. *Brain Res.* 1641(Pt A):64-78.
32. Nathubhai, A., Wood, P.J., Haikarainen, T., Hayward, P.C., Muñoz-Descalzo, S., Thompson, A.S., Lloyd, M.D., Lehtiö, L. & Threadgill, M.D. (2016). Structure-activity relationships of 2-arylquinazolin-4-ones as highly selective and potent inhibitors of the tankyrases. *Eur. J. Med. Chem.* 20:316-327.
33. Nissinen TA, Degerman J, Räsänen M, Poikonen AR, Koskinen S, Mervaala E, Pasternack A, Ritvos O, Kivelä R, Hulmi JJ. (2016). Systemic blockade of ACVR2B ligands prevents chemotherapy-induced muscle wasting by restoring muscle protein synthesis without affecting oxidative capacity or atrogenes. *Sci Rep.* 6:32695.
34. Obaji, E., Haikarainen, T. & Lehtiö, L. (2016). Characterization of the DNA dependent activation of human ARTD2/PARP2. *Sci. Rep.* 6:34487.

35. Omairi S, Matsakas A, Degens H, Kretz O, Hansson KA, Solbrå AV, Bruusgaard JC, Joch B, Sartori R, Giallourou N, Mitchell R, Collins-Hooper H, Foster K, Pasternack A, Ritvos O, Sandri M, Narkar V, Swann JR, Huber TB, Patel K. (2016). Enhanced exercise and regenerative capacity in a mouse model that violates size constraints of oxidative muscle fibres. *Elife*. 5. pii: e16940.
36. Orentaite, I., Poranen, M. M., Oksanen, H. M., Daugelavicius, R. & Bamford, D. H. (2016). K2 killer toxin-induced physiological changes in the yeast *Saccharomyces cerevisiae*. *FEMS Yeast Research*. 16(2), 1-8.
37. Paatero A, Rosti K, Shkumatov AV, Sele C, Brunello C, Kysenius K, Singha P, Jokinen V, Huttunen H, Kajander T. (2016). Crystal Structure of an Engineered LRRTM2 Synaptic Adhesion Molecule and a Model for Neurexin Binding. *Biochemistry*. 55(6):914-26.
38. Paveliev M, Fenrich KK, Kislin M, Kuja-Panula J, Kuleskiy E, Varjosalo M, Kajander T, Mugantseva E, Ahonen-Bishopp A, Khiroug L, Kuleskaya N, Rougon G, Rauvala H. (2016). HB-GAM (pleiotrophin) reverses inhibition of neural regeneration by the CNS extracellular matrix. *Sci Rep*. 6:33916.
39. Perveen, S., Rashid, N. & Papageorgiou, A.C. (2016). Crystal structure of a phosphoribosyl anthranilate isomerase from the hyperthermophilic archaeon *Thermococcus kodakaraensis*. *Acta Cryst F* 72, 804-812
40. Pietilä MK, Roine E, Sencilo A, Bamford DH, Oksanen HM. (2016). Pleolipoviridae, a newly proposed family comprising archaeal pleomorphic viruses with single-stranded or double-stranded DNA genomes. *Arch. Virol*. 161(1):249-56.
41. Rahman MM, Andberg M, Koivula A, Rouvinen J & Hakulinen N. (2016). Crystallization and X-ray diffraction analysis of an L-arabinonate dehydratase from *Rhizobium leguminosarum* bv. *trifolii* and a D-xylonate dehydratase from *Caulobacter crescentus*. *Acta Cryst. F* 72:604-608.
42. Richard JP, Amyes TL, Malabanan MM, Zhai X, Kim KJ, Reinhardt CJ, Wierenga RK, Drake EJ, Gulick AM. (2016). Structure-Function Studies on Hydrophobic Residues that Clamp a Basic Glutamate Side Chain During Catalysis by triosephosphate isomerase. *Biochemistry*, 55, 3036-3047.
43. Salminen TA, Blomqvist K, Edqvist J. (2016) Lipid transfer proteins: classification, nomenclature, structure, and function. *Planta*. 244(5):971-997.
44. Schlesinger, M., Vilchez Larrea, S.C., Haikarainen, T., Narwal, M., Venkannagari, H., Flawiá, M.M., Lehtiö, L. & Fernández Villamil, S.H. (2016). Disrupted ADP-ribose metabolism with nuclear Poly (ADP-ribose) accumulation leads to different cell death pathways in presence of hydrogen peroxide in procyclic *Trypanosoma brucei*. *Parasit. Vectors* 9:173.
45. Shakeel S., Westerhuis B.M., Domanska, A., Konig, R.I., Matadeen, R., Koster, A.J., Bakker, A.Q., Beaumont, T., Wolthers, K.C., Butcher, S.J. (2016). Multiple capsid-stabilizing interactions revealed in a high-resolution structure of an emerging picornavirus causing neonatal sepsis. *Nature Communications* 7:11387. doi: 10.1038/ncomms11387.
46. Svirskaitė J, Oksanen HM, Daugelavičius R, Bamford DH. (2016). Monitoring physiological changes in haloarchaeal cell during virus release. *Viruses*. 8(3). pii: E59.
47. Tossavainen, H., Aitio, O., Hellman, M., Saksela, K., Permi, P. (2016). Structural Basis of the High Affinity Interaction between the Alphavirus Nonstructural Protein-3 (nsP3) and the SH3 Domain of Amphiphysin-2. *J. Biol. Chem*. 291, 16307– 16317, DOI: 10.1074/jbc.M116.732412
48. Venkannagari, H., Verheugd, P., Koivunen, J., Haikarainen, T., Obaji, E., Narwal, M., Pihlajaniemi, T., Lüscher, B. & Lehtiö, L. 2016. Chemical probe rescues cells from ARTD10/PARP10 induced apoptosis and sensitizes cancer cells to DNA damage. *Cell Chem. Biol*. 23:1251-1260

2015

1. Atanasova NS, Bamford DH, Oksanen HM. 2015. Haloarchaeal virus morphotypes. *Biochimie*. 118:333-343.

2. Atanasova NS, Demina TA, Buivydas A, Bamford DH, and Oksanen HM. 2015. Archaeal viruses multiply: temporal screening in a solar saltern. *Viruses*. 7: 1902-1926.
3. Atanasova NS, Oksanen HM, and Bamford DH. 2015. Haloviruses of archaea, bacteria, and eukaryotes. *Curr. Opin. Microbiol.* 25:40-48.
4. Atanasova NS, Senčilo A, Pietilä MK, Roine E, Oksanen HM, and Bamford DH. 2015. Comparison of lipid-containing bacterial and archaeal viruses. *Adv. Virus Res.* 92:1-61.
5. Batchu KC, Hokynar K, Jeltsch M, Mattonet K, Somerharju P. Substrate Efflux Propensity Is the Key Determinant of Ca²⁺-independent Phospholipase A-β (iPLAβ)-mediated Glycerophospholipid Hydrolysis. *J Biol Chem.* 2015 Apr 17;290(16):10093–103.
6. Bhargav SP, Vahokoski J, Kallio JP, Torda AE, Kursula P, Kursula I. Two independently folding units of Plasmodium profilin suggest evolution via gene fusion. *Cell Mol Life Sci.* 2015 Nov;72(21):4193-203
7. Bhattacharjee A, Reuter S, Trojnar E, Kolodziejczyk R, Seeberger H, Hyvärinen S, Uzonyi B, Szilágyi Á, Prohászka Z, Goldman A, Józsi M, Jokiranta TS. The major autoantibody epitope on factor H in atypical hemolytic uremic syndrome is structurally different from its homologous site in factor H-related protein 1, supporting a novel model for induction of autoimmunity in this disease. *J Biol Chem.* 2015 Apr 10;290(15):9500-10.
8. Chukhlieb M, Raasakka A, Ruskamo S, Kursula P. The N-terminal cytoplasmic domain of neuregulin 1 type III is intrinsically disordered. *Amino Acids.* 2015 Aug;47(8):1567-77.
9. Dahlström KM, Salminen TA. (2015) 3D model for Cancerous Inhibitor of Protein Phosphatase 2A armadillo domain unveils highly conserved protein-protein interaction characteristics. *Journal of Theoretical Biology.* 386:78-88.
10. Gil-Carton D, Jaakkola ST, Charro D, Peralta B, Castaño-Díez, Oksanen HM, Bamford DH, Abrescia NGA. 2015. Insight into the assembly of viruses with vertical single β-barrel major capsid proteins. *Structure.* 23:1866-1877.
11. Guerrero, F., Ciragan, A., Iwaï, H. (2015) Tandem SUMO fusion vectors for improving soluble protein expression and purification. *Protein Expression Purif.* 116, 42–49.
12. Guryanov, S., Liljeroos, L. Kasaragod, P., Kajander, T., Butcher, S.J. (2015) Crystal structure of the measles virus nucleoprotein core in complex with an N-terminal region of phosphoprotein. *J. Virol.* 90:2849-57. doi: 10.1128/JVI.02865-15
13. Haka J, Niemi MH, Iljin K, Reddy VS, Takkinen K & Laukkanen M-L: Isolation of Mal d 1 and Api g 1 - specific recombinant antibodies from mouse IgG Fab fragment libraries – Mal d 1-specific antibody exhibits cross-reactivity against Bet v 1. *BMC Biotechnology* 15 (2015) 34.
14. Hong C, Pietilä MK, Fu C, Schmid MF, Bamford DH, and Chiu W. 2015. Lemon-shaped halo archaeal virus His1 with uniform tail but variable capsid structure. *Proc. Natl. Acad. Sci USA* 112:2449-54.
15. Juntunen K, Mäkinen S, Isoniemi S, Valtakari L, Pelzer A, Jänis J, Paloheimo M: A new subtilase-like protease deriving from *Fusarium equiseti* with high potential for industrial applications. *Appl. Biochem. Biotechnol.* 118 (2015) 62-69.
16. Kainulainen H, Papaioannou KG, Silvennoinen M, Autio R, Saarela J, Oliveira BM, Nyqvist M, Pasternack A, t Hoen PAC, Kujala UM, Ritvos O, Hulmi JJ. 2015. Myostatin/activin blocking combined with exercise reconditions skeletal muscle expression profile of mdx mice. *Mol Cell Endocrinol* 399:131-142.
17. Karttunen J, Mäntynen S, Ihalainen TO, Bamford JKH and Oksanen HM. 2015. Non-structural proteins P17 and P33 are involved in the assembly of the internal membrane-containing virus PRD1. *Virology.* 482: 225-233.
18. Koho T, Ihalainen TO, Stark M, Uusi-Kerttula H, Wieneke R, Rahikainen R, Blazevic V, Marjomäki V, Tampé R, Kulomaa MS, Hytönen VP. 2015. His-tagged norovirus-like particles: A versatile platform for cellular delivery and surface display. *Eur J Pharm Biopharm.* Oct;96:22-31

19. Krause, M., Neubauer, P., Wierenga, R.K. (2015) Structure based directed evolution of a monomeric triosephosphate isomerase: towards a pentose sugar isomerase. *PEDS*, 28, 187-197.
20. Kumpan, K., Nathubhai, A., Zhang, C., Wood, P.J., Lloyd, M.D., Thompson, A.S., Haikarainen, T., Lehtiö, L. & Threadgill, M.D. (2015) Structure-based design, synthesis and evaluation in vitro of aryl-naphthyridinones, arylpyridopyrimidinones and their tetrahydro derivatives as inhibitors of the tankyrases. *Bioorg Med Chem.* 23:3013-3032.
21. Labrou NE, Papageorgiou AC, Pavli O, Flemetakis E. 2015. Plant GSTome: Structure and functional role in xenome network and plant stress response. *Curr. Opin. Biotechn.* 32, 186-194 (COVER)
22. Laitaoja M, Tossavainen H, Pihlajamaa T, Valjakka J, Viiri K, Lohi O, Permi P & Jänis J:2016. Redox-dependent disulfide bond formation in SAP30L corepressor protein: Implications for structure and function. *Protein Sci.* 26: 572-586.
23. Lehtonen SI, Taskinen B, Ojala E, Kukkurainen S, Rahikainen R, Riihimäki TA, Laitinen OH, Kulomaa MS, Hytönen VP. 2015. Efficient preparation of shuffled DNA libraries through recombination (Gateway) cloning. *Protein Eng Des Sel.* Jan;28(1):23-8.
24. Lim R, Muljadi R, Koulaeva E, Vosdoganes P, Chan ST, Acharya R, Gurusinghe S, Ritvos O, Pasternack A, Wallace EM. 2015. Activin A contributes to the development of hyperoxia-induced lung injury in neonatal mice. *Pediatr Res.* Jun;77(6):749-56.
25. Liu Y, Wang J, Liu Y, Wang Y, Zhang Z, Oksanen HM, Bamford DH and Chen X. 2015. Identification and characterization of SNJ2, the first temperate pleolipovirus integrating into the genome of the SNJ1-lysogenic archaeal strain. *Mol. Microbiol.* 98: 1002-1020.
26. Liu, L., Budnjo, A., Jokela, J., Haug, B. E., Fewer, D. P, Wahlsten, M., Rouhiainen, L., Permi, P., Fossen, T., Sivonen, K. (2015) Pseudoaeruginosins, Nonribosomal Peptides in *Nodularia spumigena*. *ACS Chem. Biol.* 10 (3), 725-733. DOI: 10.1021/cb5004306
27. Llobet E, Martínez-Moliner V, Moranta D, Dahlström KM, Regueiro V, Tomás A, Cano V, Pérez-Gutiérrez C, Fernández-Carrasco H, Insua JL, Salminen TA, Garmendia J, Bengoechea JA (2015) Deciphering tissue-induced *Klebsiella pneumoniae* lipid A structure. *Proceedings of the National Academy of Sciences of the United States of America.* 112(46):E6369-78.
28. Mäntynen S, Laanto E, Kohvakka A, Poranen MM, Bamford JK, Ravantti JJ. 2015. New enveloped dsRNA phage from freshwater habitat. *J Gen Virol.* 96:1180-9.
29. Martikainen, M., Salorinne, K., Lahtinen, T., Malola, S., Permi, P., Häkkinen, H., Marjomaki, V. (2015) Hydrophobic Pocket Targeting Probes for Enteroviruses. *Nanoscale* 7, 17457– 17467, DOI: 10.1039/C5NR04139B
30. Mattila SP, Oksanen HM, and Bamford JKH. (2015). Probing of protein interactions in the membrane-containing virus PRD1. *J. Gen. Virol.* 96: 453-462.
31. Niemi MH, Rytönen-Nissinen M, Miettinen I, Jänis J, Virtanen T, Rouvinen J (2015). Dimerization of lipocalin allergens. *Sci. Rep.* 5 13841.
32. Nkizinkiko, Y., Suneel Kumar, B.V., Jeankumar, V.U., Haikarainen, T., Koivunen, J., Madhuri, C., Yogeeswari, P., Venkannagari, H., Obaji, E., Pihlajaniemi, T., Sriram, D. & Lehtiö, L. (2015) Discovery of potent and selective nonplanar tankyrase inhibiting nicotinamide mimics. *Bioorg. Med. Chem.* 23:4139-4149.
33. Onwukwe, G. U., Kursula, P., Koski, M.K., Schmitz, W., and Wierenga, R.K. (2015) Human $\Delta 3$, $\Delta 2$ -enoyl-CoA isomerase, type-2: a structural enzymology study on the catalytic role of its ACBP-domain and helix-10. *FEBS Journal*, 282, 746-768.
34. Onwukwe, G.U., Koski, M.K., Pihko, P., Schmitz, W., and Wierenga, R.K. (2015) Structures of yeast peroxisomal $\Delta 3, \Delta 2$ -enoyl-CoA isomerase complexed with acyl-CoA substrate analogues: the importance of hydrogen bond networks for the reactivity of the catalytic base and the oxyanion hole. *Acta Crystallographica D* 71, 2178-2191.

35. Paine, H.A., Nathubhai, A., Woon, E.C., Sunderland, P.T., Wood, P.J., Mahon, M.F., Lloyd, M.D., Thompson, A.S., Haikarainen, T., Narwal, M., Lehtiö, L. & Threadgill, M.D. (2015) Exploration of the nicotinamide-binding site of the tankyrases, identifying 3-arylisoquinolin-1-ones as potent and selective inhibitors in vitro. *Bioorg. Med. Chem.* 23:5891-5908.
36. Papageorgiou AC, Li DC. (2015). Expression, purification and crystallization of a family 55 b-1,3-glucanase from *Chaetomium thermophilum*. *Acta Cryst F* 71, 680-683
37. Pawlowski A, Moilanen AM, Rissanen IA, Määttä JA, Hytönen VP, Ihalainen JA, Bamford JK. (2015). The Minor Capsid Protein VP11 of Thermophilic Bacteriophage P23-77 Facilitates Virus Assembly by Using Lipid-Protein Interactions. *J Virol.* Aug;89(15):7593-603.
38. Piirainen H, Hellman M, Tossavainen H, Permi P, Kursula P, Jaakola VP. (2015). Human adenosine A2A receptor binds calmodulin with high affinity in a calcium-dependent manner. *Biophys J.* 108(4):903-17.
39. Piirainen H, Hellman M, Tossavainen H, Permi P, Kursula P, Jaakola VP (2015) Human adenosine A2A receptor binds calmodulin with high affinity in a calcium-dependent manner. *Biophys. J.* 108, 903–917
40. Poranen MM, Bamford DH, Oksanen HM. (2015). Membrane-containing bacteriophages. In: eLS. John Wiley & Sons, Ltd: Chichester. DOI: 10.1002/9780470015902.a0000779.pub3
41. Poudel N., Pfannstiel J., Simon O., Walter N., Papageorgiou A.C. & Jendrossek D. *Pseudomonas aeruginosa* Isohexenyl Glutaconyl-CoA Hydratase (AtuE) Is Upregulated in Citronellate-grown Cells and Belongs to the Crotonase Family (2015). *Appl Environ Microbiol.* 81, 6558-6566
42. Quemin ERJ, Pietilä MK, Oksanen HM, Forterre P, Rijpstra WIC, Schouten S, Bamford DH, Prangishvili D, Krupovic M. 2015. *Sulfolobus* spindle-shaped virus 1 contains glycosylated capsid proteins, a cellular chromatin protein and host-derived lipids. *J Virol.* 15: 11681-91.
43. Raasakka A, Myllykoski M, Laulumaa S, Lehtimäki M, Härtlein M, Moulin M, Kursula I, Kursula P. Determinants of ligand binding and catalytic activity in the myelin enzyme 2',3'-cyclic nucleotide 3'-phosphodiesterase. *Sci Rep.* 2015 Nov 13;5:16520.
44. Ray S, Steven RT, Green FM, Höök F, Taskinen B, Hytönen VP, Shard AG. (2015). Neutralized chimeric avidin binding at a reference biosensor surface. *Langmuir.* Feb 17;31(6):1921-30.
45. Rosti K, Goldman A, Kajander T. (2015). Solution structure and biophysical characterization of the multifaceted signalling effector protein growth arrest specific-1. *BMC Biochem.* Feb 28;16:8.
46. Roukens MG, Peterson-Maduro J, Padberg Y, Jeltsch M, Leppänen V-M, Bos FL, et al. (2015). Functional Dissection of the CCBE1 Protein A Crucial Requirement for the Collagen Repeat Domain. *Circ Res.* 116(10):1660–9.
47. Auer S, Koho T, Uusi-Kerttula H, Vesikari T, Blazevic V, Hytönen VP. (2015). Rapid and sensitive detection of norovirus antibodies in human serum with a biolayer interferometry biosensor. *Sensors and Actuators B: Chemical.* Jun;507-514.
48. Sencilo A, Luhtanen A-M, Saarijärvi M, Bamford DH, Roine E. (2015). Cold-active bacteriophages from the Baltic Sea ice have diverse genomes and virus-host interactions. *Environ Microbiol.* 17:3628-41.
49. Seppälä, J., Tossavainen, H., Rodic, N., Permi, P., Pentikäinen, U., Ylännä, J. (2015). Flexible structure of peptide-bound filamin A mechanosensor domain pair 20-21. *PLoS One*, 10(8) doi: 10.1371/journal.pone.0136969
50. Shakeel S., Westerhuis B.M., Ora, A., Koen, G., Bakker, A.Q., Claassen, Y., Wagner, K., Beaumont, T., Wolthers, K.C., Butcher, S.J. (2015) Structural basis of human parechovirus neutralization by human monoclonal antibodies. *J. Virol.* 89:9571-80
51. Shishido, T. K., Humisto, A., Jokela, J., Liu, L., Wahlsten, M., Tamrakar, A., Fewer, D. P., Permi, P., Andreote, A. P. D., Fiore, M. F., Sivonen, K. (2015) Antifungal Compounds from Cyanobacteria. *Mar. Drugs* 13, 2124-2140.

52. Skopelitou, K., Muleta, A.W., Papageorgiou, A.C., Chronopoulou, E. & Labrou, N.E. (2015). Catalytic features and crystal structure of a tau class glutathione transferase from Glycine max specifically upregulated in response to soybean mosaic virus infections. *Biochim. Biophys. Acta* 1855, 166-177
53. Sonkar, K. S., Pachauri, M., Kumar, A., Shukla, A., Patel, M., Jagannadham, M. V. (2015). Heme-peroxidase from medicinal plant *Artocarpus lakoocha*: Purification, characterization and wound healing studies. *Biocatal. Agricult. Biotechn.* 4, 180-190
54. Soronen J, Haridas PAN, Sädevirta S, Mysore R, Quagliarini F, Pasternack A, Metso J, Perttilä J, Leivonen M, Jaser N, Smas C, Wabitsch M, Ehnholm C, Ritvos O, Jauhiainen M, Olkkonen VM, Yki-Järvinen H. (2015). Regulation of angiopoietin-like proteins (ANGPTLs) 3, and 8 by insulin in vivo and in cultured cells. *J Clin Endocrinol Metab*, 100:E1299-1307.
55. Taberman H, Andberg M, Koivula A, Hakulinen N, Penttilä M, Rouvinen J & Parkkinen T. (2015). Structure and function of *Caulobacter crescentus* aldose-aldose oxidoreductase. *Biochem. J.* 472:297-307.
56. Tamminen JA, Yin M, Rönty M, Sutinen E, Pasternack A, Ritvos O, Myllärniemi M, Koli K. (2015). Overexpression of activin-A and -B in malignant mesothelioma - attenuated Smad3 signaling responses and ERK activation promote cell migration and invasive growth. *Exp Cell Res.* Mar 1;332(1):102-15.
57. Tamminen K, Balboa D, Toivonen S, Pakarinen MP, Wiener Z, Alitalo K, Otonkoski T. (2015). Intestinal Commitment and Maturation of Human Pluripotent Stem Cells Is Independent of Exogenous FGF4 and R-spondin1. *PLoS One.* Jul 31;10(7):e0134551.
58. Tossavainen, H., Hellman, M., Piirainen, H. Jaakola, V. P., Permi, P. (2015) HN, N, C α , C β and C' assignments of the intrinsically disordered C-terminus of human adenosine A2A receptor. *Biomol NMR Assign* 9: 403. doi:10.1007/s12104-015-9618-y
59. Tossavainen, H., Seppälä, J., Sethi, R., Pihlajamaa, T., Permi, P. (2015) HN, NH, C α , C β , and methyl group assignments of filamin multidomain fragments IgFLNc4–5 and IgFLNa3–5. *Biomol NMR Assign* 9: 47. doi:10.1007/s12104-014-9542-6
60. Vegh, R. B., Bloch, D. A., Bommarius, A. S., Verkhovsky, M., Pletnev, S., Iwaï, H., Bochenkova, A. V., Solntsev, K. M. (2015) Hidden Photoinduced Reactivity of the Blue Fluorescent Protein mKalama1. *Phys. Chem. Chem. Phys.*, 17(19):12472-12485.

2014

1. Anbazhagan, P., Harijan, R.K., Kiema, T.R., Janardan, N., Murthy, M.R.N., Michels, P.A.M., Juffer, A.H., Wierenga, R.K., (2014) Phylogenetic relationships and classification of thiolases and thiolase-like proteins of *Mycobacterium tuberculosis* and *Mycobacterium smegmatis*. *Tuberculosis*, 94, 405-412.
2. Aranko, A. S., Oeemig, J. S., Zhou, D., Kajander, T., Wlodawer, A., Iwaï, H. (2014) Structure-based engineering and comparison of novel split inteins for protein ligation. *Mol. Biosyst.* 10 (5), 1023 - 1034
3. Aranko, A. S., Wlodawer, A., Iwaï, H. (2014) Nature's recipe for splitting inteins. *Protein Eng. Des. Sel.* 27(8), 263–271.
4. Barrier E, Braz Fernandes FM, Bujan M, Feiters MC, Froideval A, Ghijsen J, Hase T, Hough MA, Jergel M, Jimenez I, Kajander T, Kikas A, Kokkinidis M, Kover L, Larsen HB, Lawson DM, Lawniczak-Jablonska K, Mariani C, Mikulik P, Monnier J, Morera S, McGuinness C, Müller-Buschbaum P, Meedom Nielson M, Pietsch U, Tromp M, Simon M, Stangl J, Zanotti G. The benefit of the European User Community from transnational access to national radiation facilities. *J Synchrotron Radiat.* 2014 May;21(Pt 3):638-9.
5. Blikstad C, Dahlström KM, Salminen TA, Widersten M. (2014) Substrate Scope and Selectivity in Offspring to an Enzyme Subjected to Directed Evolution. *FEBS Journal.* 281(10):2387-98.

6. Dumont E, Jokipii-Lukkari S, Parkash V, Vuosku J, Sundström R, Nymalm Y, Sutela S, Taskinen K, Kallio PT, Salminen TA, Häggman H. (2014) Evolution, Three-Dimensional Model and Localization of Truncated Hemoglobin PttTrHb of Hybrid Aspen. *PLoS One*. 9(2):e88573.
7. Edstam MM, Laurila M, Höglund A, Raman A, Dahlström KM, Salminen TA, Edqvist J, Blomqvist K (2014) Characterization of the GPI-anchored lipid transfer proteins in the moss *Physcomitrella patens*. *Plant Physiology and Biochemistry*. 75:55-69.
8. Fukao, T., Akiba, K., Goto M., Kuwayama, N., Morita, M., Hori, T., Aoyama, Y., Venkatesan, R., Wierenga, R., Moriyama, Y., Hashimoto, T, Usuda, N., Murayama, K., Ohtake, A., Hasegawa, Y., Shigematsu, Y., and Hasegawa, Y. (2014) The first case in Asia of 2-methyl-3-hydroxybutyryl-CoA dehydrogenase deficiency (HSD10 disease) with atypical presentation. *Journal of Human Genetics*, 59, 609-614.
9. Haikarainen, T., Frioux, C., Zhnag, L.-Q., Li, D.-C. & Papageorgiou, A.C. (2014) Crystal structure and biochemical characterization of a manganese superoxide dismutase from *Chaetomium thermophilum*. *Biochim. Biophys. Acta* 1844, 422-429
10. Haikarainen, T., Narwal, M., Joensuu, P. & Lehtiö, L. (2014) Evaluation and Structural Basis for the inhibition of Tankyrases by PARP Inhibitors. *ACS Med. Chem. Lett.* 20:12-22.
11. Hellman, M., Piirainen, H., Jaakola, V. P., Permi, P. (2014) Bridge over troubled proline: assignment of intrinsically disordered proteins using (HCA)CON(CAN)H and (HCA)N(CA)CO(N)H experiments concomitantly with HNCO and i(HCA)CO(CA)NH. *J. Biomol. NMR* 58: 49. doi:10.1007/s10858-013-9804-0
12. Hong C, Oksanen HM, Liu X, Jakana J, Bamford DH, and Chiu W. 2014. A structural model of the genome packaging process in a membrane-containing double stranded DNA virus. *PLoS Biol.* 12:e1002024.
13. Jeltsch M, Jha SK, Tvorogov D, Anisimov A, Leppänen V-M, Holopainen T, et al. CCBE1 Enhances Lymphangiogenesis via A Disintegrin and Metalloprotease With Thrombospondin Motifs-3-Mediated Vascular Endothelial Growth Factor-C Activation. *Circulation*. 2014 May 13;129(19):1962–71.
14. Kiema, T.R, Harijan, R.K., Strozyk, M., Fukao, T., Alexson, S., and Wierenga, R.K. (2014) The crystal structure of human mitochondrial 3-ketoacyl-CoA thiolase (T1): insight into the reaction mechanism of its thiolase and thioesterase activities. *Acta Crystallographica*, D70, 3212-3225.
15. Köhler M, Karner A, Leitner M, Hytönen VP, Kulomaa M, Hinterdorfer P, Ebner A. 2014. pH-dependent deformations of the energy landscape of avidin-like proteins investigated by single molecule force spectroscopy. *Molecules*. Aug 18;19(8):12531-46.
16. Koho T, Koivunen MR, Oikarinen S, Kummola L, Mäkinen S, Mähönen AJ, Sioofy-Khojine A, Marjomäki V, Kazmertsuk A, Junttila I, Kulomaa MS, Hyöty H, Hytönen VP, Laitinen OH. 2014. Coxsackievirus B3 VLPs purified by ion exchange chromatography elicit strong immune responses in mice. *Antiviral Res.* Apr;104:93-101.
17. Kokkola T, Suuronen T, Molnár F, Määttä JA, Salminen A, Jarho EM, Lahtela-Kakkonen M. 2014. AROS has a context-dependent effect on SIRT1. *FEBS Lett.* 2014 May 2;588(9):1523-8.
18. Krupovic M, Bamford DH, Koonin EV. 2014. Conservation of major and minor jelly-roll capsid proteins in Polinton (Maverick) transposons suggests that they are bona fide viruses. *Biol. Direct.* 9:6
19. Kukkurainen S, Määttä JA, Saeger J, Valjakka J, Vogel V, Hytönen VP. 2014. The talin-integrin interface under mechanical stress. *Mol Biosyst.* Dec;10(12):3217-28.
20. Kurppa K, Hytönen VP, Nakari-Setälä T, Kulomaa MS, Linder MB. 2014. Molecular engineering of avidin and hydrophobin for functional self-assembling interfaces. *Colloids Surf B Biointerfaces*. Aug 1;120:102-9.

21. Kursula P. Crystallographic snapshots of initial steps in the collapse of the calmodulin central helix. *Acta Crystallogr D Biol Crystallogr.* 2014 Jan;70(Pt 1):24-30.
22. Lehtimäki N, Koskela MM, Dahlström KM, Pakula E, Lintala M, Scholz M, Hippler M, Hanke GT, Rokka A, Battchikova N, Salminen TA, Mulo P. (2014) Posttranslational Modifications of ferredoxin-NADP+ oxidoreductase in Arabidopsis Chloroplasts. *Plant Physiology.* 166(4):1764-76.
23. Liu, L., Jokela, J., Herfindal, L., Wahlsten, M., Sinkkonen, J., Permi, P., Fewer, D. P., Døskeland, S. O., Sivonen, K. (2014) 4-Methylproline Guided Natural Product Discovery: Co-Occurrence of 4-Hydroxy- and 4-Methylprolines in Nostoweipeptins and Nostopeptolides. *ACS Chem. Biol.* 9 (11), 2646-2655 DOI: 10.1021/cb500436p
24. Liu, L., Jokela, J., Wahlsten, M., Nowruzi, B., Permi, P., Zhang, Y. Z., Xhaard, H., Fewer D.P., Sivonen K. (2014) Nostosins, Trypsin Inhibitors Isolated from the Terrestrial Cyanobacterium Nostoc sp. Strain FSN. *J. Nat. Prod.* 77 (8), 1784-1790 DOI: 10.1021/np500106w
25. Luhtanen A-M, Eronen-Rasmus E, Kaartokallio H, Rintala J-M, Autio R, and Roine E. 2014. Isolation and characterization of phage-host systems from the Baltic Sea ice. *Extremophiles.* 18: 121-130.
26. Magarkar A, Mele N, Abdel-Rahman N, Butcher S, Torkkeli M, Serimaa R, Paananen A, Linder M, Bunker A. (2014) Hydrophobin film structure for HFBI and HFBII and mechanism for accelerated film formation. *PLOS Computational Biology* 10.1371/journal.pcbi.1003745
27. Meriläinen, G., and Wierenga, R.K. (2014) Crystallization and preliminary X-ray diffraction studies of the C-terminal domain of Chlamidia trachomatis CdsD. *Acta Cryst.* F70, 1431-1433.
28. Mönttinen HAM, Ravantti JJ, Stuart DI, and Poranen MM. 2014. Automated structural comparisons clarify the phylogeny of the right-hand-shape polymerases. *Mol Biol Evol.* 31:2741-52.
29. Myllärniemi M, Tikkanen J, Hulmi JJ, Pasternack AH, Sutinen E, Rönty M, Leppäranta O, Kinnula V, Ma H, Ritvos O, Koli K. 2014. Upregulation of activin-B and follistatin in pulmonary fibrosis - a translational study using human biopsies and a specific inhibitor in mouse fibrosis models. *BMC Pulm Med* 14:170.
30. Näreoja T, Ebner A, Gruber HJ, Taskinen B, Kienberger F, Hänninen PE, Hytönen VP, Hinterdorfer P, Härmä H. 2014. Kinetics of bioconjugate nanoparticle label binding in a sandwich-type immunoassay. *Anal Bioanal Chem.* Jan;406(2):493-503.
31. Niemi MH, Rytönen-Nissinen M, Jänis J, Virtanen T & Rouvinen J: Structural aspects of dog allergies: the crystal structure of a dog dander allergen Can f 4. *Mol. Immunol.* 61(2014) 7-15.
32. Papageorgiou, A.C. & Matsson, J. (2014) Protein structure validation and analysis with X-ray crystallography. *Methods Mol. Biol.* 1129:397-421
33. Peterhoff, D., Beer, B., Rajendra, C., Kumpula, E-P., Kapetaniou, E., Guldán, H., Wierenga, R.K., Sterner, R., Babinger, P. (2014) A comprehensive analysis of the geranylgeranylglyceryl phosphate synthase enzyme family identifies novel members and reveals mechanisms of substrate specificity and quaternary structure organization. *Molecular Microbiology*, 92, 885-899.
34. Pietilä MK, Demina TA, Atanasova NS, Oksanen HM, and Bamford DH. 2014. Archaeal viruses and bacteriophages: comparisons and contrasts. *Trends in Microbiol.* 22:334-344.
35. Pinon P, Pärssinen J, Vazquez P, Bachmann M, Rahikainen R, Jacquier MC, Azizi L, Määttä JA, Bastmeyer M, Hytönen VP, Wehrle-Haller B. 2014. Talin-bound NPLY motif recruits integrin-signaling adapters to regulate cell spreading and mechanosensing. *J Cell Biol.* Apr 28;205(2):265-81.
36. Raasakka A, Kursula P. The myelin membrane-associated enzyme 2',3'-cyclic nucleotide 3'-phosphodiesterase: on a highway to structure and function. *Neurosci Bull.* 2014 Dec;30(6):956-66.
37. Rangl M, Leitner M, Riihimäki T, Lehtonen S, Hytönen VP, Gruber HJ, Kulomaa M, Hinterdorfer P, Ebner A. 2014. Investigating the binding behaviour of two avidin-based testosterone binders using molecular recognition force spectroscopy. *J Mol Recognit.* Feb;27(2):92-7.
38. Relizani K, Mouisel E, Giannesini B, Hourdé C, Patel K, Gonzales SM, Jülich K, Vignaud A, Piétri-Rouxel F, Fortin D, Garcia L, Blot S, Ritvos O, Bendahan D, Ferry A, Ventura-Clapier R, Schuelke M,

- Amthor H. 2014. Blockade of ActRIIB signalling triggers muscle fatigability and metabolic myopathy. *Mol Ther* 22:1423-1433.
39. Repo H, Kuokkanen E, Oksanen E, Goldman A, Heikinheimo P. Is the bovine lysosomal phospholipase B-like protein an amidase? *Proteins*. 2014 Feb;82(2):300-11.
 40. Ruskamo S, Yadav RP, Sharma S, Lehtimäki M, Laulumaa S, Aggarwal S, Simons M, Bürck J, Ulrich AS, Juffer AH, Kursula I, Kursula P. Atomic resolution view into the structure-function relationships of the human myelin peripheral membrane protein P2. *Acta Crystallogr D Biol Crystallogr*. 2014 Jan;70(Pt 1):165-76.
 41. Sethi, R., Seppälä, J., Tossavainen, H., Ylilauri, M., Ruskamo, S., Pentikäinen, O. T., Pentikäinen, U., Permi, P., Yläne, J. (2014) A Novel Structural Unit in the N-terminal Region of Filamins. *J. Biol. Chem.* 289: 8588–98. pmid:24469451
 42. Shunmugam, S., Jokela, J., Wahlsten, M., Battchikova, N., Rehman, A. U., Vass, I., Karonen, M., Sinkkonen, J., Permi, P., Sivonen, K., Aro, E.-M., Allahverdiyeva, Y. (2014) Secondary metabolite from *Nostoc XPORK14A* inhibits photosynthesis and growth of *Synechocystis PCC 6803*. *Plant Cell Environ.* 37: 1371–1381. doi:10.1111/pce.12243
 43. Sun X, Bamford DH, Poranen MM. 2014. Electrostatic interactions drive the self-assembly and the transcription activity of the *Pseudomonas* phage $\Phi 6$ procapsid. *J Virol.* 88: 7112-7116.
 44. Taberman H, Andberg M, Parkkinen T, Jänis J, Penttilä M, Hakulinen N, Koivula A & Rouvinen J: The structure and function of a decarboxylating *Agrobacterium tumefaciens* keto-deoxy-D-galactarate dehydratase. *Biochemistry* 53 (2014) 8052-8060.
 45. Taberman H, Andberg M, Parkkinen T, Richard P, Hakulinen N, Koivula A & Rouvinen J: Purification, crystallization and preliminary X-ray diffraction analysis of a novel keto-deoxy-D-galactarate (KDG) dehydratase from *Agrobacterium tumefaciens*. *Acta Cryst. F* 70 (2014) 49-52.
 46. Taskinen B, Airene TT, Jänis J, Rahikainen R, Johnson MS, Kulomaa MS, Hytönen VP. 2014. A novel chimeric avidin with increased thermal stability using DNA shuffling. *PLoS One.* Mar 14;9(3):e92058.
 47. Taskinen B, Zauner D, Lehtonen SI, Koskinen M, Thomson C, Kähkönen N, Kukkurainen S, Määttä JA, Ihalainen TO, Kulomaa MS, Gruber HJ, Hytönen VP. 2014. Switchavidin: reversible biotin-avidin-biotin bridges with high affinity and specificity. *Bioconjug Chem.* 25:2233-43.
 48. Tossavainen H, Kukkurainen S, Määttä JA, Kähkönen N, Pihlajamaa T, Hytönen VP, Kulomaa MS, Permi P. 2014. Chimeric Avidin--NMR structure and dynamics of a 56 kDa homotetrameric thermostable protein. *PLoS One.* 9:e100564.
 49. Vahokoski J, Bhargav SP, Desfosses A, Andreadaki M, Kumpula EP, Martinez SM, Ignatev A, Lepper S, Frischknecht F, Sidén-Kiamos I, Sachse C, Kursula I. 2014. Structural differences explain diverse functions of *Plasmodium* actins. *PLoS Pathog.* 10:e1004091.
 50. Venkatesan, R., Sah-Teli, S.K., Awoniyi L.O., Jiang, G., Prus, P., Kastaniotis, A. J., Hiltunen, J.K., Wierenga, R.K., and Chen, Z. (2014) Insights into mitochondrial fatty acid synthesis from the structure of heterotetrameric 3-ketoacyl-ACP reductase/3R-hydroxyacyl-CoA dehydrogenase. *Nat Communications* 5:4805.
 51. Vestola, J., Shishido T. K., Jokela, J., Fewer, D. P., Aitio, O., Permi, P., Wahlsten, M., Wang, H., Rouhiainen, L., Sivonen, K. (2014) Hassallidins, antifungal glycolipopeptides, are widespread among cyanobacteria and are the end-product of a nonribosomal pathway. *PNAS* 111 (18) E1909-E1917
 52. Wiener Z, Band AM, Kallio P, Högström J, Hyvönen V, Kaijalainen S, Ritvos O, Haglund K, Kruuna O, Robine S, Louvard D, Ben-Neriah Y, Alitalo K. 2014. Oncogenic mutations in intestinal adenomas regulate Bim-mediated apoptosis induced by TGF β . 111:E2229-36.

1. Anantharajan, J., Koski, M.K., Kursula, P., Hieta, R., Bergmann, U., Myllyharju, J., and Wierenga, R.K. (2013) The unique structural motifs for substrate binding and dimerization of the alfa subunit of collagen prolyl 4-hydroxylase. *Structure*, 21, 2107-18.
2. Anisimov A, Leppanen V-M, Tvorogov D, Zarkada G, Jeltsch M, Holopainen T, et al. The Basis for the Distinct Biological Activities of Vascular Endothelial Growth Factor Receptor-1 Ligands. *Sci Signal*. 2013 Jul 2;6(282):ra52.
3. Anisimov A, Tvorogov D, Alitalo A, Leppänen V-M, An Y, Han EC, et al. Vascular Endothelial Growth Factor-Angiopoietin Chimera With Improved Properties for Therapeutic Angiogenesis. *Clinical Perspective. Circulation*. 2013 Jan 29;127(4):424–34.
4. Aranko, A. S., Oeemig, J. S., Iwai, H. (2013) Structural basis for protein trans-splicing by a Bacterial Intein-Like domain: protein ligation without nucleophilic side-chains. *FEBS J*. 280, 3256-3269
5. Aranko, A. S., Oeemig, J. S., Kajander, T., Iwai H. (2013) Intermolecular domain swapping induces intein-mediated protein alternative splicing. *Nat. Chem. Biol*. 9, 616–622
6. Atanasova NS, Pietilä M, and Oksanen HM. 2013. Diverse antimicrobial interactions of halophilic archaea and bacteria extend over geographical distances and cross the domain barrier. *MicrobiologyOpen*. 2: 811-825.
7. Badia-Martinez D, Oksanen HM, Stuart, DI, and Abrescia NGA. 2013. Combined approaches to study virus structures. In: *Structure and Physics of Viruses: An intergrated Textbook, Subcellular Biochemistry 68*. Ed: Mateu MG. Springer. pp. 203-246.
8. Battula, P., Dubnovitsky, A.P. and Papageorgiou, A.C. (2013). Structural basis of L-phosphoserine binding to phosphoserine aminotransferase. *Acta Cryst. D* 69, 804-811.
9. Bhattarjee, A., Oeemig, J. S., Kolodziejczyk, R., Meri, T., Kajander, T., Iwai, H., Jokiranta, T. S., Goldman, A. (2013) Structural basis for complement evasion by Lyme disease pathogen *Borrelia burgdorferi*. *J. Biol. Chem*. 288, 18685-18695
10. Bligt-Lindén E, Arunachalam R, Parkash V, Salminen TA. (2013) Structural comparison of the active site channels in rodent and primate vascular adhesion protein-1. *Journal of Neural Transmission*. 120(6):947-50.
11. Bligt-Lindén E, Pihlavisto M, Szatmári I, Otwinowski Z, Smith DJ, Lázár L, Fülöp F, Salminen TA. (2013) Novel Pyridazinone Inhibitors for Vascular Adhesion Protein-1 (VAP-1): Old target - New Inhibition Mode. *Journal of Medicinal Chemistry*. 56(24):9837-48.
12. Blikstad C, Dahlström KM, Salminen TA, Widersten M (2013) Stereoselective Oxidation of Aryl-Substituted Vicinal Diols into Chiral α -Hydroxy Aldehydes by Re-Engineered Propanediol Oxidoreductase *ACS Catalysis*. 3:3016–3025.
13. Carmel D*, Dahlström KM*, Holmström M, Allahverdiyeva Y, Battchikova N, Aro EM, Salminen TA*, Mulo P.* (2013) Structural model, physiology and regulation of Slr0006 in *Synechocystis* PCC 6803. *Archives of Microbiology*. 195(10-11):727-36.
14. Fewer, D. P., Jokela, J., Paukku, E., Österholm, J., Wahlsten, M., Permi, P., Aitio, O., Rouhiainen, L., Gomez-Saez, G. V., Sivonen, K. (2013) New Structural Variants of Aeruginosin Produced by the Toxic Bloom Forming Cyanobacterium *Nodularia spumigena*. *PLoS ONE* 8(9): e73618. doi: 10.1371/journal.pone.0073618
15. Fukao, T., Aoyama, Y., Murase, K., Hori, T., Harijan, R.K., Wierenga, R.K., Boneh, A., and Kondo, N. (2013) Development of MLPA for human ACAT1 gene and identification of a heterozygous Alu-mediated deletion of exons 3 and 4 in a patient with mitochondrial acetoacetyl-CoA thiolase (T2) deficiency. *Molecular Genetics and Metabolism*, 110, 184-187.
16. Haikarainen, T., Koivunen, J., Narwal, M., Venkannagari, H., Obaji, E., Joensuu, P., Pihlajaniemi, T. & Lehtiö, L. (2013) Para substituted 2-phenyl-3,4-dihydroquinazolin-4-ones as potent and selective tankyrase inhibitors. *ChemMedChem* 8:1978-1985.

17. Haikarainen, T., Loimaranta, V., Prieto-Lopez, C., Battula, P., Finne, J. & Papageorgiou, A.C. (2013). Expression, purification and crystallization of the C-terminal LRR domain of *Streptococcus pyogenes* 0843 protein. *Acta Cryst F69*, 559-561.
18. Haikarainen, T., Venkannagari, H., Narwal, M., Obaji, E., Lee, H.W., Nkizinkiko, Y. & Lehtiö, L. (2013) Structural basis and selectivity of tankyrase inhibition by a Wnt signaling inhibitor WIKI4. *PLoS One* 8:e65404.
19. Han H, Myllykoski M, Ruskamo S, Wang C, Kursula P. Myelin-specific proteins: a structurally diverse group of membrane-interacting molecules. *Biofactors*. 2013 May-Jun;39(3):233-41.
20. Hanhijärvi KJ, Žiedaitė G, Pietilä MK, Haeggström E, and Bamford DH. 2013. DNA ejection from an archaeal virus - a single-molecule approach. *Biophys. J.* 104:2264-2272.
21. Happonen LJ, Oksanen E, Liljeroos L, Goldman A, Kajander T, Butcher SJ. (2013) The structure of the NTPase that powers DNA packaging into *Sulfolobus* turreted icosahedral virus 2. *J Virol.* 87(15):8388-98.
22. Harijan, R.K., Kiema, T.R., Karjalainen, M.P., Janardan, N., Murthy, M.R., Weiss, M.S., Michels, P.A., Wierenga, R.K. (2013) Crystal structures of SCP2-thiolases of *Trypanosomatidae*, human pathogens causing widespread tropical diseases: the importance for catalysis of the cysteine of the unique HDCF loop. *Biochem J.*, 455, 119-130.
23. Hedegaard, S., Nilsson, C., Laurinmäki, P., Butcher, S.J., Urtti, A., Yaghmur, A. (2013) Nanostructured aqueous dispersions of citrem interacting with lipids and PEGylated lipids. *RSC Advances* 3:24576–24585.
24. Hetzel, U., Sironen, T., Laurinmäki, P., Liljeroos, L., Patjas, A., Henttonen, H., Vaheri, A., Artelt, A., Kipar, A., Butcher, S.J., Vapalahti O., Hepojoki J. (2013) Isolation, identification and characterization of novel Arenaviruses, the etiological agent of Boid Inclusion Body Disease. *J. Virol.* 87:20 10918-10935
25. Hirvonen, S, Karesoja, M., Karjalainen, E., Hietala, S., Laurinmäki, P., Vesanen, E., Butcher, S.J., Tenhu, H. (2013) Colloidal properties and gelation of aqueous dispersions of conductive poly(benzimidazobenzophenanthroline) derivatives. *Polymer* 54:694-701
26. Hulmi JJ, Oliveira BM, Silvennoinen M, Hoogaars WM, Pasternack A, Kainulainen H, Ritvos O. 2013. Exercise restores decreased physical activity levels and increases markers of autophagy and oxidative capacity in myostatin/activin-blocked mdx mice. *Am J Physiol Endocrinol Metab.* 305:E171-82.
27. Hulmi JJ, Oliveira BM, Silvennoinen M, Hoogaars WMH, Ma H, Pierre P, Pasternack A, Kainulainen H, Ritvos O. 2013. Muscle protein synthesis, mTORC1/MAPK/Hippo signaling, and capillary density are altered by blocking of myostatin and activins. *Am J Physiol Endocrinol Metab.* 304: E41–E50.
28. Jendrossek, D., Hermawan, S., Subedi, B. & Papageorgiou, A.C. (2013). Biochemical analysis and structure determination of poly(3-hydroxybutyrate) (PHB) depolymerase PhaZ7 mutants reveal the PHB binding site and details of substrate-enzyme interactions. *Mol. Microbiol.* 90, 649-664.
29. Kajander T, Kelloso J, Goldman A. (2013) Inorganic pyrophosphatases: one substrate, three mechanisms. *FEBS Lett.* 27;587(13):1863-9.
30. Karjalainen, E., Chenna, N., Laurinmäki, P., Butcher, S.J., Tenhu H. (2013) Diblock copolymers consisting of polymerized ionic liquid and poly(N-isopropylacrylamide). Effects of PNIPAM block length and counter ion on self-assembling and thermal properties. *Polym. Chem.* 4:1014-1024
31. Kasaragod, P., Schmitz, W., Hiltunen, J.K., Wierenga, R.K. (2013) The isomerase and hydratase reaction mechanism of the crotonase active site of the multifunctional enzyme (type-1), as deduced from structures of complexes with 3S-hydroxy-acyl-CoA. *FEBS J.*, 280, 3160-3175.
32. Kelloso J, Kajander T, Honkanen R, Goldman A. Crystallization and preliminary X-ray analysis of membrane-bound pyrophosphatases. *Mol Membr Biol.* 2013 Feb;30(1):64-74.

33. Leikoski, N., Liu, L., Jokela, J., Wahlsten, M., Gugger, M., Calteau, A., Permi, P., Kerfeld, C. A., Sivonen, K., Fewer, D. P. (2013) Genome mining expands the chemical diversity of the cyanobactin family to include highly modified linear peptides. *Chem Biol* 2013, 1033–1043, doi: 10.1016/j.chembiol.2013.06.015
34. Leppänen VM, Tvorogov D, Kisko K, Prota AE, Jeltsch M, Anisimov A, Markovic-Mueller S, Stuttgart E, Goldie KN, Ballmer-Hofer K, Alitalo K. Structural and mechanistic insights into VEGF receptor 3 ligand binding and activation. *Proc Natl Acad Sci U S A*. 2013 Aug 6;110(32):12960-5.
35. Leppiniemi J, Meir A, Kähkönen N, Kukkurainen S, Määttä JA, Ojanen M, Jänis J, Kulomaa MS, Livnah O, Hytönen VP. 2013. The highly dynamic oligomeric structure of bradavidin II is unique among avidin proteins. *Protein Sci*. Jul;22(7):980-94.
36. Maksimainen MM, Lampio A, Mertanen M, Turunen O & Rouvinen J: The crystal structure of acidic b-galactosidase from *Aspergillus oryzae*. *Int. J. Biol. Macromol.* 60 (2013) 109-115. Hakulinen N, Gasparetti C, Kaljunen H, Kruus K & Rouvinen J: The crystal structure of an extracellular cathecol oxidase from the ascomycete fungus. *J. Biol. Inorg. Chem.* 18(2013) 917-929.
37. Mikula KM, Kolodziejczyk R, Goldman A. Yersinia infection tools-characterization of structure and function of adhesins. *Front Cell Infect Microbiol.* 2013 Jan 8;2:169.
38. Myllykoski M, Raasakka A, Lehtimäki M, Han H, Kursula I, Kursula P. Crystallographic analysis of the reaction cycle of 2',3'-cyclic nucleotide 3'-phosphodiesterase, a unique member of the 2H phosphoesterase family. *J Mol Biol.* 2013 Nov 15;425(22):4307-22.
39. Narwal, M., Haikarainen, T., Fallarero, A., Vuorela, P.M. & Lehtiö, L. (2013) Screening and structural analysis of flavones inhibiting tankyrases. *J. Med Chem.* 56:3507-3517.
40. Narwal, M., Koivunen, J., Haikarainen, T., Obaji, E., Legala, O., Venkannagari, H., Joensuu, P., Pihlajaniemi, T. & Lehtiö, L. (2013) Discovery of Tankyrase Inhibiting Flavones with Increased Potency and Isoenzyme Selectivity. *J. Med Chem.* 56:7880-7889.
41. Nilsson, C., Barrios-Lopez, B., Kallinen, A., Laurinmäki, P., Butcher, S.J., Raki, M., Bergström, K., Weng Larsen, S., Østergaard, J., Larsen, C., Urtti, A., Airaksinen, A., Yaghmur, A. (2013) SPECT/CT imaging of radiolabeled cubosomes and hexosomes for potential theranostic applications. *Biomaterials* 34:8491-8503
42. Pakharukova N, Tuittila M, Zavialov A. (2013) Crystallization and sulfur SAD phasing of AggA, the major subunit of aggregative adherence fimbriae type I from the *Escherichia coli* strain that caused an outbreak of haemolytic-uraemic syndrome in Germany. *Acta Crystallogr F* 69, 1389-1392
43. Peralta B, Gil-Carton D, Castaño-Díez D, Bertin A, Boulogne C, Oksanen HM, Bamford DH, and Abrescia NGA. 2013. Mechanism of membranous tunnelling nanotube formation in viral genome delivery. *PLoS Biol.* 11: e1001667.
44. Pietilä MK, Atanasova NS, Oksanen HM, and Bamford DH. 2013. Modified coat protein forms the flexible spindle-shaped virion of haloarchaeal virus His1. *Environ. Microbiol.* 15:1674-1686.
45. Pietilä, M.K., Laurinmäki, P., Russell, D.A., Ko, C., Jacobs-Sera, D., Butcher, S.J., Bamford, D.H., Hendrix, R.W. (2013) Insights into head-tailed viruses infecting extremely halophilic archaea. *J. Virol.* 87:3248-3260
46. Pietilä, M.K., Laurinmäki, P., Russell, D.A., Ko, C., Jacobs-Sera, D., Hendrix, R.W., Bamford, D.H., Butcher, S.J.. (2013) Structure of the archaeal head-tailed virus HSTV-1 completes the HK97-fold story. *Proc. Natl. Acad. Sci. (USA)* 110:10604-10609
47. Pihlajamaa, T., Kajander, T., Knuuti, J., Horkka, K., Sharma, A., Permi, P. (2013) Structure of *Plasmodium falciparum* TRAP (thrombospondin-related anonymous protein) A domain highlights distinct features in apicomplexan von Willebrand factor A homologues. *Biochemical J.* 450 (3) 469-476; DOI: 10.1042/BJ20121058
48. Ravantti JJ, Bamford DH, and Stuart DI. 2013. Automatic comparison and classification of protein structures. *J. Struct. Biol.* 183:47-56.

49. Senčilo A, Jacobs-Sera D, Russell DA, Ko C-C, Bowman CA, Atanasova NS, Österlund E, Oksanen HM, Bamford DH, Hatfull GF, and Roine E, and Hendrix RW. 2013. Snapshot of haloarchaeal tailed virus genomes. *RNA Biol.* 10: 33-46.
50. Sun X, Pirttimaa MJ, Bamford DH, and Poranen MM. 2013. Rescue of maturation off-pathway products in the assembly of Pseudomonas phage $\phi 6$. *J. Virol.* 87: 13279-13286.
51. Tamminen JA, Parviainen V, Rönty M, Wohl AP, Murray L, Joenväärä S, Varjosalo M, Leppäranta O, Ritvos O, Sengle G, Renkonen R, Myllärniemi M, Koli K. 2013. Gremlin-1 associates with fibrillin microfibrils in vivo and regulates mesothelioma cell survival through transcription factor slug. *Oncogenesis.* 26;2:e66.
52. Taskinen B, Zmurko J, Ojanen M, Kukkurainen S, Parthiban M, Määttä JA, Leppiniemi J, Jänis J, Parikka M, Turpeinen H, Rämetsä M, Pesu M, Johnson MS, Kulomaa MS, Airene TT, Hytönen VP. 2013. Zebavidin--an avidin-like protein from zebrafish. *PLoS One.* Oct 24;8(10):e77207.
53. Toivola J, Nikkanen L, Dahlström KM, Salminen TA, Lepistö A, Vignols F, Rintamäki E (2013) Overexpression of chloroplast NADPH-dependent thioredoxin reductase in Arabidopsis enhances leaf growth and elucidates in vivo function of reductase and thioredoxin domains. *Frontiers in Plant Science.* 4:389.
54. Tossavainen H, Helppolainen SH, Määttä JA, Pihlajamaa T, Hytönen VP, Kulomaa MS, Permi P. 2013. Resonance assignments of the 56 kDa chimeric avidin in the biotin-bound and free forms. *Biomol NMR Assign.* 7(1):35-8.
55. Venkannagari, H., Fallarero, A., Feijs, K.L., Lüscher, B. & Lehtiö, L. (2013) Activity-based assay for human mono-ADP-ribosyltransferases ARTD7/PARP15 and ARTD10/PARP10 aimed at screening and profiling inhibitors. *Eur. J. Pharm. Sci.* 49:148-156
56. Venkatesan, R., Wierenga, R.K. (2013) Structure of mycobacterial -oxidation trifunctional enzyme reveals its altered assembly and putative substrate channeling pathway. *American Chemical Society-Chemical Biology*, 8, 1063-1075.
57. Villefranc JA, Nicoli S, Bentley K, Jeltsch M, Zarkada G, Moore JC, et al. A truncation allele in vascular endothelial growth factor c reveals distinct modes of signaling during lymphatic and vascular development. *Development.* 2013;140(7):1497–506.
58. Vitale R, Roine E, Bamford, DH, and Corcelli A. 2013. Lipid fingerprints of intact viruses by MALDI-TOF mass spectrometry. *Biochim Biophys Acta.* 1831: 872-879.
59. Ylilauri M, Mattila E, Nurminen EM, Käpylä J, Niinivehmas SP, Määttä JA, Pentikäinen U, Ivaska J, Pentikäinen OT. 2013. Molecular mechanism of T-cell protein tyrosine phosphatase (TCPTP) activation by mitoxantrone. *Biochim Biophys Acta.* Oct;1834(10):1988-97.