CURRICULUM VITAE

NIBIO
NORWEGIAN INSTITUTE OF BIOECONOMY RESEARCH

PERSONAL INFORMATION

Full name	**Lisa PARUCH**
Gender	Female
Nationality	Norwegian
Scientific degree	PhD
Present position	Research Scientist
Affiliation	Department of Hydrology and Water Environment, Division of Environment and Natural Resources, NIBIO - Norwegian Institute of Bioeconomy Research, Pb 115, NO-1431 Aas, Norway

CONTACT INFORMATION

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KEY QUALIFICATIONS

- Clinical medicine (MD), medical microbiology and immunology (MSc) and microbial genetics (PhD).
- Molecular biology and biotechnology.
- Microbial source tracking (MST) of water faecal contamination.
- Host-specific genetic markers.
- Clinical relevant pathogens present in water, soil and biogas digestate materials.
- Analyses of antibiotic resistance genes (ARGs) in the environment.
- Microbial pollution and water quality measures.
- Microbial diversity of water and biogas digestates with special focus on bacteria and archaea.
- High-throughput Next Generation DNA Sequencing (NGS) technology, e.g. Illumina MiSeq platform.
- Bioinformatic analyses on DNA/RNA molecules, quantitative real-time PCR (qPCR) and Illumina sequencing data analysis.
- Functional genetic markers of carbon and nitrogen cycles.

EDUCATION

Dates	
2001	PhD in Microbial Genetics (disputation date: 26.06.2001). Department of Biochemistry, Dalian University of Technology, P.R. China.
1995	MSc in Medical Microbiology and Immunology. Department of Microbiology, Dalian Medical University, P.R. China.
1992	BSc in Clinical Medicine. Faculty of Clinical Medicine, Dalian Medical University, P.R. China.

WORK EXPERIENCE

Dates (from – to)	
2012 onwards	Research Scientist, NIBIO - Norwegian Institute of Bioeconomy Research, Aas, Norway.
2004 - 2011	Research Scientist, LingVitae Genomics AS, Vollesveien 13H, 1366 Lysaker, Norway.

	2002 - 2004	Postdoctoral Researcher (PostDoc), Department of Chemistry and Biotechnology, Norwegian University of Life Sciences, Aas, Norway.
	1995 - 2002	Research scientist, Department of Medical Microbiology and Immunology, Dalian Medical University, P.R. China.
	1995 - 1998	Researcher, Section of Research and Development, Dalian Wan-Da Pharmaceutical Industry, P.R. China.
	1992 - 1993	Clinical Doctor, Dalian Medical University Affiliated Hospital, P.R. China.
PERSONAL SKILLS AND COMPETENCES		
Languages	- Chinese, English and Norwegian.	
Professional skills and competences	- Independent work: management experiences in national and international projects. - Teamwork: good abilities in working with national and international groups. - Presentation: oral/panel and poster.	
Organisational skills and competences	- National and international project applications. - Organising conferences and seminars. - Responsibilities for academic lectures.	
Technical skills and competences	- Performance of microbiological and molecular analyses. - Operation of laboratory instruments for detection and enumeration of pathogens and ARGs.	
Computer skills and competences	- Programmes: MS Office, Bioinformatics. - Operating systems: Windows.	
Academic activities - consulting, teaching and knowledge transfer	- Lecturer for BSc and MSc courses at the Dalian Medical University, P.R. China. - Supervisor for BSc and MSc candidates. - External reviewer and examiner for MSc and BSc theses.	
Editorial Board	- Principal Editor, English Version of Chinese Academic Journal of Microbial Ecology. - Chinese Academic Journal of Microbial Ecology.	
ADDITIONAL INFORMATION		
Memberships	- The Norwegian Society of Graduate Technical and Scientific Professionals (Tekna)	

LIST OF SCIENTIFIC PUBLICATIONS:

1. Paruch, L., Paruch, A.M., Eiken, H.G., Skogen, M., Sørheim, R. 2020. Seasonal dynamics of lotic bacterial communities assessed by 16S rRNA gene amplicon deep sequencing. *Scientific Reports*,10, 16399. https://doi.org/10.1038/s41598-020-73293-9
2. Gavrila A-M., Zaharia A., Paruch L., Perrin F.X., Sarbu A., Olaru A.G., Paruch A.M., Iordache T-V. 2020. Molecularly imprinted films and quaternary ammonium-functionalized microparticles working in tandem against pathogenic bacteria in wastewaters. *Journal of Hazardous Materials*, 399, 123026. https://doi.org/10.1016/j.jhazmat.2020.123026
3. Vingerhagen R., Paruch A.M., Paruch L., Kvisle V. 2020. Fekalkildesporing i Nitelva, Lillestrøm kommune. Skyldes det mennesker? (Faecal source tracking in Nitelva. Does it originate from humans?). *Vann*, 55(2), 163-170. http://vannforeningen.no/wp-content/uploads/2020/06/Vingerhagen.pdf
4. Paruch L., Paruch A.M., Sørheim R. 2020. DNA-based faecal source tracking of contaminated drinking water causing a large *Campylobacter* outbreak in Norway 2019. *International Journal of Hygiene and Environmental Health*. https://doi.org/10.1016/j.ijheh.2019.113420
5. van Eerde A., Várnai A., Jameson J.K., Paruch L., Moen A., Anonsen J.H., Chylenski P., Steen H.S., Heldal I., Bock R., Eijsink V.G.H., Liu-Clarke J. 2020. In-depth characterization of Trichoderma reesei cellobiohydrolase TrCel7A produced in Nicotiana benthamiana reveals limitations of cellulase production in plants by host-specific post-translational modifications. *Plant Biotechnology Journal*, 18(3), 631-643. https://doi.org/10.1111/pbi.13227
6. Paruch L., Paruch A.M., Eiken H.G., Sørheim R. 2019. Faecal pollution affects abundance and diversity of aquatic microbial community in anthropo-zoogenically influenced lotic ecosystems. *Scientific Reports*, 9, 19469. https://doi.org/10.1038/s41598-019-56058-x
7. Paruch L., Paruch A.M., Eiken H.G., Sørheim R. 2019. Aquatic microbial diversity associated with faecal pollution of Norwegian waterbodies characterized by 16S rRNA gene amplicon deep sequencing. *Microbial Biotechnology*, 12(6), 1487-1491. https://doi.org/10.1111/1751-7915.13461

8. Yang H., Paruch L., Chen X., van Eerde A., Skomedal H., Wang Y., Liu D., Liu-Clarke J. 2019. Antibiotic application and resistance in swine production in China: Current situation and future perspectives. *Frontiers in Veterinary Science*, 6:136. https://doi.org/10.3389/fvets.2019.00136
9. Paruch L., Paruch A.M. 2018. *Contributors to faecal water contamination in urban environments*. Zelenakova M. (eds) Water Management and the Environment: Case Studies. WINEC 2017. Water Science and Technology Library, vol 86. Springer, Cham, pp 215-230. https://doi.org/10.1007/978-3-319-79014-5_10
10. Svensson K., Paruch L., Gaby J.C., Linjordet R. 2018. Feeding frequency influences process performance and microbial community composition in anaerobic digesters treating steam exploded food waste. *Bioresource Technology*, 269, 276-284. https://doi.org/10.1016/j.biortech.2018.08.096
11. Dobrica M.O., Lazar C., Paruch L., van Eerde A., Clarke J.L., Tucureanu C., Caras I., Ciulean S., Onu A., Tofan V., Branzan A., Urban S., Stavaru C., Branza-Nichita N. 2018. Oral administration of a chimeric Hepatitis B Virus S/preS1 antigen produced in lettuce triggers infection neutralizing antibodies in mice. *Vaccine*, 36(38), 5789-5795. https://doi.org/10.1016/j.vaccine.2018.07.072
12. Wang Y., Lysøe E., Armarego-Marriott T., Erban A., Paruch L., van Eerde A., Bock R., Liu-Clarke J. 2018. Transcriptome and metabolome analyses provide insights into root and root-released organic anion responses to phosphorus deficiency in oat. *Journal of Experimental Botany*, 69(15), 3759-3771. https://doi.org/10.1093/jxb/ery176
13. Paruch L., Paruch A.M. 2017. The importance of melting curve analysis in discriminating faecal and environmental *Bacteroidales* bacteria. *Microbiology*, 86(4), 536-538. https://doi.org/10.1134/S0026261717040117
14. Dobrica M.O., Lazar C., Paruch L., Skomedal H., Steen H., Haugslien S., Tucureanu C., Caras I., Onu A., Ciulean S., Branzan A., Clarke J.L., Stavaru C., Branza-Nichita N. 2017. A novel chimeric Hepatitis B virus S/preS1 antigen produced in mammalian and plant cells elicits stronger humoral and cellular immune response than the standard vaccine-constituent, S protein. *Antiviral Research*, 144, 256-265. https://doi.org/10.1016/j.antiviral.2017.06.017
15. Paruch L., Paruch A.M., Blankenberg A-G.B., Haarstad K., Mæhlum T. 2017. Norwegian study on microbial source tracking for water quality control and pollution removal in constructed wetland treating catchment run-off. *Water Science and Technology*, 76(5), 1158-1166. https://doi.org/10.2166/wst.2017.303
16. Krystad R., Paruch A.M., Paruch L., Mæhlum T. 2017. Gjenåpning av byvassdrag: forekomst, kilder og rensing av *E. coli* i Teglverksdammen i Hovinbekken, Oslo (Deculverting of urban watercourses: occurrence, sources and removal of *E. coli* in Teglverksdammen in Hovinbekken, Oslo). *Vann*, 52(4), 373-386. https://vannforeningen.no/wp-content/uploads/2018/04/Krystad.pdf
17. Clarke J.L., Paruch L., Dobrica M.O., Caras I., Tucureanu C., Onu A., Ciulean S., Stavaru C., Eerde A., Wang Y., Steen H., Haugslien S., Petrareanu C., Lazar C., Popescu C.I., Bock R., Dubuisson J., Branza-Nichita N. 2017. Lettuce-produced hepatitis C virus E1E2 heterodimer triggers immune responses in mice and antibody production after oral vaccination. *Plant Biotechnology Journal*, 15(12), 1611-1621. https://doi.org/10.1111/pbi.12743
18. Blankenberg A-G.B., Paruch A.M., Paruch L., Deelstra J., Haarstad K. 2016. *Nutrients tracking and removal in constructed wetlands treating catchment runoff in Norway*. In: Vymazal J. (ed) Natural and Constructed Wetlands. Springer International Publishing Switzerland, pp. 23-40. https://doi.org/10.1007/978-3-319-38927-1_2
19. Budai A., Rasse D.P., Lagomarsino A., Lerch T.Z., Paruch L. 2016. Biochar persistence, priming and microbial responses to pyrolysis temperature series. *Biology and Fertility of Soils*, 52(6), 749-761. https://doi.org/10.1007/s00374-016-1116-6
20. Paruch L., Paruch A.M., Blankenberg A-G.B., Bechmann M., Mæhlum T. 2015. Application of host-specific genetic markers for microbial source tracking of faecal water contamination in an agricultural catchment. *Acta Agriculturae Scandinavica, Section B — Soil & Plant Science*, 65(S2), 164-172. https://doi.org/10.1080/09064710.2014.941392
21. Blankenberg A-G., Paruch A.M., Bechmann M., Paruch L. 2015. Betydning av spredt avløp i jordbrukslandskapet (Rural decentralized wastewater treatment systems in agricultural catchments). *Vann*, 50(1), 8-17. https://vannforeningen.no/wp-content/uploads/2015/06/2015_924546.pdf
22. De Vuyst L., Makras L., Avonts L., Holo H., Yi Q. (present Paruch L.), Servin A., Fayol-Messaoudi D., Berger C., Zoumpopoulou G., Tsakalidou E., Sgouras D., Martinez-Gonzales B., Panayotopoulou E., Mentis A., Smarandache D., Savu L., Thonart P., Nes I. 2004. Antimicrobial potential of probiotic or potentially probiotic lactic acid bacteria, the first results of the international European research project PROPATH of the PROEUHEALTH cluster. *Microbial Ecology in Health and Disease*, 16(2-3), 125-130. https://doi.org/10.1080/08910600410032303
23. Wang G.L., Yi Q. (present Paruch L.), Fang H.J. 2003. Transforming and secreting expression of human egf in mutant strain WYBS2001 of Bacillus and its functions. *Acta Genetica Sinica*, 30(2), 97-102. https://www.ncbi.nlm.nih.gov/pubmed/12776595

PROFESSIONAL PAPERS, FEATURE ARTICLES AND BROCHURES:

1. Paruch A.M. Paruch L., Mæhlum T. 2017. Kildesporing av fekal vannforurensing med molekylærbiologiske metoder – eksempler på undersøkelser i Norge (Source tracking of faecal water contamination by molecular biology methods – examples of surveys in Norway). *Vannspeilet* 2-2017, 4-5. https://www.norskvann.no/kompetanse/norsk-vann-bulletin
2. Paruch A.M. Paruch L., Mæhlum T. 2014. Implementering av molekylærbiologiske metoder for kildesporing av fekal vannforurensing og vurdering av helsefare (Implementation of molecular methods for faecal source tracking of water

contamination and evaluation of health risk). *Bioforsk TEMA* 9(19), 4 pp. http://www.bioforsk.no/ikbViewer/Content/109843/Bioforsk%20TEMA%209%20(19).pdf

3. Blankenberg A-G., Bechmann M., Paruch L., Paruch A. 2014. Spredt avløp I jordbrukslandskapet (Decentralised wastewater treatment systems in agricultural landscape). *Bioforsk TEMA* 9(12), 4pp. http://www.bioforsk.no/ikbViewer/Content/109416/TEMA_vol9_nr12_2014_Spredt_avlop.pdf

REPORTS:

1. Paruch A.M., Paruch L. 2019. Kildesporing av fekal vannforurensning i området rundt Hunnebunn, Fredrikstad kommune: Fekale forurensningskilder i Vispen badeplass og noen bekker rundt Hunnebunn. NIBIO Rapport 5/125, 40 pp.
2. Haaland S., Bechmann M., Eikebrokk B., Eregno F., Greipsland I., Heistad A., Paruch A. Paruch L. Riise G., Rohrlack T., TurtumøygardS. 2018. Forurensingsanalyse av drikkevannskilden Jordalsvatnet med vanntilsigsområde. NIBIO Rapport 4/120, 86 pp.
3. Tryland I., Mæhlum T., Wennberg A.C., Paruch A.M., Krystad R., Paruch L., Ranneklev S., Fosholt Moe T., Haande S., Myrmel M, Robertson L., Fergus T., Beschorner A-L., Kvitsjøen J. 2017. Tiltak for å oppnå bedre hygienisk vannkvalitet til rekreasjonsformål i overvann og byvassdrag - forprosjekt for å identifisere forskningsbehov (Measures to achieve better hygienic water quality for recreational purposes in urban waterways - pre-project to identify research needs). NIVA-rapport 7190-2017, ISSN 1894-7948, ISBN 978-82-577-577-6925-3, 75 pp.
4. Paruch A.M., Paruch L., Mæhlum T. 2017. Kildesporing av fekal vannforurensing med molekylærbiologiske metoder – Eksempler på undersøkelser i Norge (Source tracking of fecal water contamination by molecular biology methods – Examples of surveys in Norway). NIBIO Rapport 3/66, 70 pp.
5. Paruch A.M., Paruch L., Mæhlum T. 2016. Kildesporing av fekal vannforurensing i Jordalsvatnet med nedbørfelt (Source tracking of fecal water contamination in the catchment of Jordalsvatnet lake). NIBIO Rapport 2/49, 42 pp.
6. Paruch A.M., Paruch L., Mæhlum T. 2016. Kildesporing av fekal vannforurensing i tilløpsbekkene til Jonsvannet (Source tracking of fecal water contamination in tributaries of Jonsvannet lake). NIBIO Rapport 2/34, 60 pp.
7. Paruch A.M., Paruch L., Mæhlum T. 2016. Kildesporing av fekal vannforurensing i noen av tilløpsbekkene til Maridalsvannet og utløp Akerselva (Source tracking of fecal water contamination in some tributaries of the Maridal lake and the mounth of the Aker river). NIBIO Rapport 2/27, 25 pp.
8. Blankenberg A-G., Bechmann M., Turtumøygard S., Paruch A., Paruch L. 2014. Spredt avløp i jordbrukslandskapet. Tilførsel av fosfor og *E. coli* i jordbruksbekker (Decentralised wastewater treatment systems in agricultural landscape. Inputs of phosphorus and *E. coli* to agricultural streams). Bioforsk Report 9(6), 22 pp.
9. Paruch, L., Paruch, A., Blankenberg, A-G.B., Bechmann, M. & Mæhlum, T. 2014. Application of host-specific genetic markers for microbial source tracking of faecal water contamination in agricultural catchment. NJF Report 10(3), 43-44.

PATENTS INVOLVED:

1. US20080057546: Methods of Cloning and Producing Fragment Chains with Readable Information Content, 2007.
2. US20090053699: Method for Preparing Polynucleotides for Analysis, 2006.
3. US20090047744: Method for Improving the Characterization of A Polynucleotide Sequence, 2006.
4. US20080248536: Polynucleotide Ligation Reactions, 2005.
5. US20080286769: Sequencing a Polymer Molecule, 2005.
6. US20090239213: Identifying a Target Polynucleotide, 2005.

PROJECT ADMINISTRATION, COORDINATION, MANAGEMENT AND PARTICIPATION WITH TASK RESPONSIBILITIES:

- INTERNATIONAL PROJECTS:

1. 2020-2023. *"BIOSHELL: Recycling crustaceans shell wastes for developing biodegradable wastewater cleaning composites"*. Project under the ERA-NET BlueBio COFUND (Paruch L. – Project manager).
2. 2018-2021. *"RICEDIG: Greenhouse gas emissions from biogas digestate applications to rice production systems"*. Project funded by the Research Council of Norway (Paruch L. – WP Leader).
3. 2017-2020. *"TANDEM: Bactericidal hybrid surfaces against gram-negative and gram-positive pathogenic bacteria: Smart tools for wastewater purification"*. Project under the M-Era.Net (an EU funded network) with consortium from Romania and Norway (Paruch L. – Key Scientist).
4. 2014-2017. *"AQUARIUS: Assessing water quality improvement options concerning nutrient and pharmaceutical contaminants in rural watersheds"*. Project funded under the EEA/Norwegian Financial Mechanism (Project in the Czech Republic, Paruch L. – Key Scientist).
5. 2014-2017. *"GREENVAC: Development of a cost effective Romania-Norway joint plant-based technology platform for production of vaccines against Human Hepatitis viruses B (HBV) and C (HCV)"*. Project funded under the EEA/Norwegian Financial Mechanism (Project in Romania, Paruch L. – Key Scientist).
6. 2014-2017. *"Sustainable biogas production in South African rural households"*. Project funded by the Research Council of Norway NFR-nr. 234203/H30 (Paruch L. – Key Scientist).

7. 2008-2011. *"Digital Sequencing project"*. FP7 of the European Union, LingVitae Genomics AS - EU contract 222913 (Paruch L. – Key Scientist).
8. 2004-2006. *"Development of new platform technology for molecular analysis"*. Project under the FUGE Program by the Research Council of Norway granted to LingVitae Genomics AS (Paruch L. – Key Scientist).
9. 2002-2005. "PROPATH: Molecular analysis and mechanistic elucidation of the functionality of probiotics and prebiotics in the inhibition of pathogenic microorganisms to combat gastrointestinal disorders and to improve human health". FP5 of the European Union, Grant agreement QLK1-CT-2001-01179. PROEUHEALTH - The Food, GI-Tract and Human Health Cluster (Paruch L. – PostDoc).

- NATIONAL PROJECTS:

10. 2017. *"Pollution analysis of the drinking water source Jordalsvatnet with drainage basin, Bergen municipality, NOR 037-2017" (Forurensningsanalyse av drikkevannskilden Jordalsvatnet med vanntilsigsområde, Bergen kommune, NOR 037-2017)*. Research project supported by Bergen municipality (Paruch L. – Key Scientist).
11. 2015. *"Source tracking of fecal water contamination in the catchment of Jordalsvatnet lake" (Kildesporing av fekal vannforurensing i nedbørfelt av Jordalsvatnet)*. Research project supported by Bergen municipality (Paruch L. – Key Scientist).
12. 2015. *"Source tracking of fecal water contamination in tributaries of Jonsvannet lake" (Kildesporing av fekal vannforurensing i tilløpsbekkene til Jonsvannet)*. Research project supported by Trondheim municipality (Paruch L. – Key Scientist).
13. 2014-2015. *"Source tracking of fecal water contamination in some tributaries of the Maridal lake and the mounth of the Aker river" (Kildesporing av fekal vannforurensing i noen av tilløpsbekkene til Maridalsvannet og utløp Akerselva)*. Research project supported by Oslo municipality (Paruch L. – Key Scientist).