

Rannsóknastöðin Rif Rif Field Station

Annual report 2022



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Resume

2022 brought new changes to Rif Field Station (Rif). Rif is now operated by the Northeast Iceland Nature Research Centre (NNA). Pedro Rodrigues continues to be the manager of Rif to develop the station in accordance with the Rif's Research and Monitoring Plan 2021-2025 (R&M) and the NNA projects. The financial management of Rif is now established and improved by NNA.

Rif continues to be a member of INTERACT and since March 2022 is an official member of the INPA - INTERACT Non-Profit Association.

Ongoing projects were accomplished based on the R&M, and new projects from NNA were also implemented. In relation to the local development and education, Rif continued to develop projects with the Myndlistaskólinn í Reykjavík and started a new project with the students from the local schools.

Various groups of researchers and students visit Rif during the year, and several already communicate interest in returning during the present year.

2022 brought new challenges for Rif, but with the effort of the team, now as part of NNA, board members, local people, and national and international institutional collaborations, these were overcome and turned into new opportunities.

Overall, 2022 was a good year for Rif, and our team is looking forward to the year ahead to continue to develop Rif and preserve Melrakkaslétta natural heritage.

Research and monitoring plan 2021-2025

Rif's strategy for the next few years will continue to follow the Research and Monitoring Plan 2021-2025 (R&M). The R&M plan is available online on Rif's webpage ([Rif's Research and Monitoring Plan 2021-2025 \(wordpress.com\)](#)).

The main objective of the R&M plan is to ensure the long-term sustainability of Rif, developing three main points (Research, Education, and Local development), in collaboration with national and international institutes, to build the foundations for its future international recognition as an institute of excellence for the study of climate change and its impact on the southern edge of the Arctic ecosystem.

At the Research level, Rif will continue to implement and develop the Freshwater and Terrestrial Arctic Biodiversity Monitoring Plan in collaboration with national and international institutions and within the Work Package 7 in the INTERACT, to enhance the scientific knowledge of the Arctic biodiversity and its threats. As part of these goals, Rif will continue to provide good data management and communication of scientific findings.

At the Education level, Rif will collaborate with the local schools through the development of projects, aiming to increase the interest in science, Nature, and its conservation. Rif will encourage students to develop their research in the Melrakkaslétta area (i.e., Erasmus, Master and PhD theses, etc.), in collaboration with national and international universities and institutes. Small lectures and the development of projects will be established with local schools. Rif could also act as a precursor of summer courses for university students, ecotourism professionals and environmental staff employees.

At the Local Development level, Rif will support the local community being an active organization, encouraging that jobs created at the station will benefit locals, helping on the development of small ecotourism companies, giving formation on the biodiversity of Melrakkaslétta, implementing good practice rules to keep a sustainable tourism activity in the area, and engaging citizen science projects to include the local knowledge on Rif's projects and activities.

The development of the R&M for the years 2021 to 2025, was fundamental to obtain funds from the Ministry of the Environment and Natural Resources and the Municipality of Norðurþing.

As part of NNA, it was implemented new monitoring projects.

Rif's board

2022 brought changes to the Rif's board. Aðalsteinn Örn Snæþórsson have left the board and Þorkell Lindberg Þórarinnsson replaced him as representative from the Náttúrustofa Norðausturlands. The other members of the board are Embla Eir Oddsdóttir, representing the Háskólinn á Akureyri and the Stofnum Vilhjálms Stefánssonar, Hlynur Óskarsson, representing the Lanbúnaðarháskóli and the Háskóli Íslands, Starri Heiðmarsson, representing the **Náttúrustofa Norðurlands Vestra**, and Birna Björnsdóttir, representing the Sveitarfélagið Norðurþing.

There were two board meetings, the first on the 24th of March in Húsavík, to discuss the future of Rif under the operation of NNA, and on the 26th of October, to officially confirm Rif as part of NNA, and to present the development of Rif's projects.

Team 2022



Pedro Rodrigues

Biology degree (University of Azores, Portugal), MSc in Marine Sciences (University of Porto, Portugal), PhD in Biology, expertise in Animal Biology – Natural History (University of Azores, Portugal).

Manager of Rif Field Station since May 10, 2021, in Raufarhöfn. Responsible for the development of Rif's scientific and education activities and projects, biodiversity monitoring, local development, and institutional growth.



Árdís Höskuldsdóttir

Graduated in Fisheries (University of Akureyri).

Partial worker in Raufarhöfn as a technician on the project HiLDA – Iceland as a model for high-latitude dust sources. Her contract finished on the end of the year 2022.

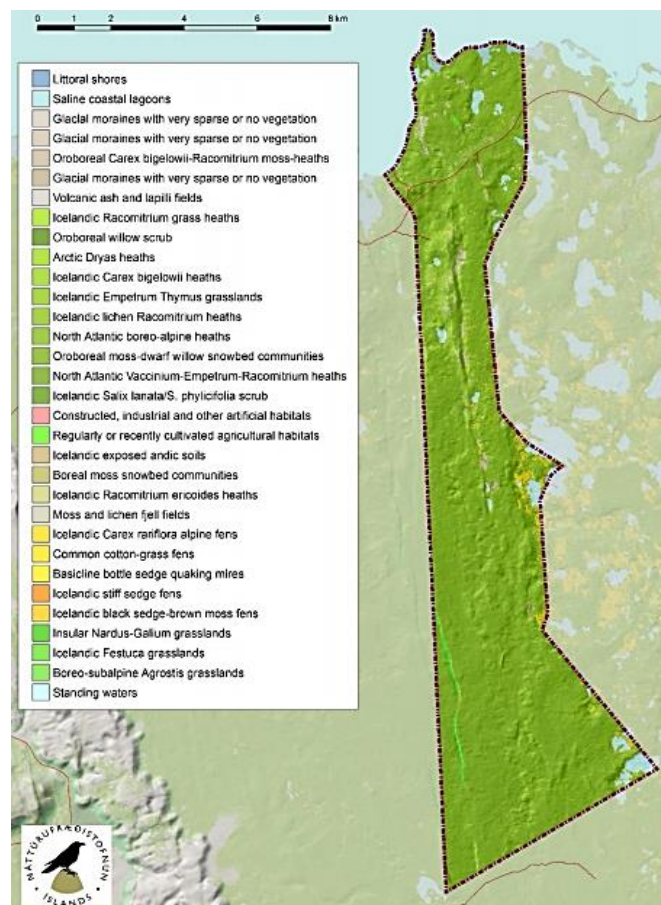
Housing and research infrastructures

The station's housing facilities at Raufarhöfn continued to be merged with the Nest guesthouse at Aðalbraut 16, which includes accommodation and cooking facilities, as well as storage (prices in the table below). The facility has also been used as an office for the station's staff with internet connection. Rif has a laboratory at Raufarhafnarskóli, renovated in 2019 with tables, chairs, one microscope, one magnifier, a refrigerator, and a probe to measure temperature and pH. During 2023 there will be the need to acquire one freezer and lab material as glasses and technical utensils for measurement and use of microscope and magnifier lens.

Prices per night staying in Nest guesthouse during 2022. Prices are already with 30% discount for Rif.

Number of persons per room	1	2	3	Studio
Price (ISK)	7.700	11.800	15.900	20.100

Rif continues to use the land of the former farm named Rif, which as been used as an intensive monitoring and research area, 3 km south from the Arctic Circle, 15 km northwest from Raufarhöfn village. There is a meteorological station implemented by Rif and the Icelandic Meteorological Office in September 2018.



Rif area in Melrakkaslétta, with the description of habitats.

Activities during 2022

Reception of scientists and students

Rif received several students, teachers, and researchers during 2022, in a total of more than 150 persons. From these, six groups spent one or more nights in Nest Guesthouse through Rif, in a total of 159 nights. All these individuals/groups brought income to Raufarhöfn by their staying in Nest Guesthouse and in the local hotel, and using the local services as the bank, post office, swimming pool, minimarket, restaurant, cafe, and bar.

These are the individuals/groups that were received by Rif:

- Group of students and teachers from the Polar Biology semester within the Environmental Science of the Arctic Program from DIS Nonprofit Study Abroad Foundation;



Group from the Polar Biology course from the DIS Nonprofit Study Abroad Foundation in Rif.

- Evangelos Mourkas (Bath University, UK), postdoc researcher from the project “CAB-AMR, *Campylobacter* in arctic birds as an indicator of global spread of antimicrobial resistant zoonotic pathogens”. Project INTERACT Trans-National Access;
- Jose Valdebenito and Oscar Garcia Miranda (University of Debrecen, Hungary), postdoc and master student, respectively, from the project “Association of mating system variation with sex-specific immune function and gut microbiota in shorebirds”;

- Þórný Barðadóttir, PhD student in Tourism studies at the University of Iceland;
- Gunnar Hallgrímsson (University of Iceland), Ron Summers and Bozena Summers (UK). They are studying the movements of purple sandpipers using geolocators;
- Nina Vurdelja and Kimmo Hokkanen (University of Tampere, Finland), PhD students on performative aspects of changing environmental narratives and embodied knowledge about human-non-human relationships;
- Group of students and teachers from the Wildlands Studies program;



Group from the Wildlands Studies program collecting dust (Project HiLDA) with Margrét Höskuldsdóttir.

- Andrew Maccoll and a colleague (University of Nottingham, UK), specialists in the ecology and evolution of three-spined stickleback fish;
- Ólafur Karl Nielsen and a colleague (Icelandic Institute of Natural History);
- Second group of students and teachers of the Polar Biology course from the DIS Nonprofit Study Abroad Foundation;
- Patrícia Carvalho and Nuno Ferreira Santos (Portuguese journalists from Público newspaper in Portugal), for the project “Portugal and Iceland: investigating biodiversity and world changes together”, funded under the Fund for Bilateral Relations- FBR-Open-Call#1EEA Grant;
- Group of students and teachers from Myndlistaskólanum í Reykjavík;
- Group of national and foreign artists attending a workshop in Raufarhöfn. This is part of the project Rif is developing with Icelandic artists to use art as a way of communicating scientific issues to the general public, with special focus on climate change;



Group from Myndlistaskólanum í Reykjavík in Melrakkaslétta in Hraunhafnartangi.

- Group of artists from Röstin Residency in Langanes;
- Konrad Kandler and Tom Dean, from the Technische Universität Darmstadt, Germany (project HiLDA), to access their dust collectors located in Raufarhöfn and take the samples that Árdís Höskuldsdóttir had collected during the year;
- Teachers and students from Lundur and Raufarhöfn Schools. A Presentation was made at the local school about Melrakkaslétta biodiversity with focus on birds and their adaptations. There were several activities around the area such as a birdwatching trip, observation of seals, collecting of coastal invertebrates (bird's food), and setting up of mist nets to explain how to capture and sample birds.



Group of students and teachers from Lundur and Raufarhöfn schools observing seals near Raufarhöfn.

Research and Monitoring

During 2022, Rif developed several monitoring projects in Melrakkaslétta in collaboration with national and international institutes, following the Rif Field Station Ecosystem Monitoring developed with the direction of the Circumpolar Biodiversity Monitoring Program (CBMP) as part of INTERACT Work Package 7. Also new monitoring projects started under the Northeast Iceland Nature Research Centre umbrella:

- **Freshwater monitoring**, project in collaboration with Náttúrustofa Norðausturlands to collect freshwater data in Arnavatn in Rif area and collect flies;
- **Harbour seal monitoring**, project in collaboration with Selasetur Íslands. Four counting days were performed across Melrakkaslétta and Sandur (Oxarfjörður area), during May and June, to monitor the presence of harbour seals (*Phoca vitulina*);
- **Constant Effort Station**. A bird ringing stations was implemented in Akurgerði forest to collect data from passerines. The long-time data obtained by a constant effort station is important to estimate the population trends of species in the study areas and the health state of the ecosystem. Climate change affect patterns and some species could leave the area and others arrive, affecting the presence of vector borne diseases. During 2023, a constant effort station across the Melrakkaslétta coast will be developed;



Common redpoll (*Acanthis flammea*) captured in Akurgerði forest.

- **HiLDA – Iceland as a model for high-latitude dust sources**, project in collaboration with the University of Darmstadt, Germany. Every week samples are collected from several dust meters installed in Raufarhöfn and stored in the laboratory. This project ended at the end of the year;
- **Art C³ - Art for climate change communication**. Project in collaboration with the Myndlistaskólinn í Reykjavík. The objective of this project is to develop workshops to bring together artists and scientists to increase the understanding of the artist community on the impacts of climate change, to give scientists a new view on how to communicate science using art, to gain exposure to new ways to view and interpreting the environment, and to explore art as an effective communication technique to bring awareness about climate change;
- **Art Course in Raufarhöfn**. Rif is a collaborator in the course Endimörk Alheimsins: Náttúra og líf við ysta haf, developed by the Myndlistaskólinn í Reykjavík in Raufarhöfn.
- **Tunicates from Raufarhöfn**, project in collaboration with Joana Micael from the Náttúrustofa Suðvesturlands. Samples of tunicates from the Raufarhöfn harbour were collected and a monitoring system of seawater surface temperature and pH were implemented to create a data set on sea abiotic parameters;



Tunicate Sea Peach, Eplamöttull (*Halocynthia pyriformis*), in Raufarhöfn harbour.

- **Arctic Passion – Pan-Arctic observing System of Systems: Implementing Observations for societal Needs.** Project funded by the EU, in the call H2020-LC-CLA-2018-2019-2020 – “Building a low-carbon, climate-resilient future: climate action in support of the Paris Agreement”. Interact INPA is a partner;
- **CRYPTO – Molecular Identification of Cryptogenic Macroalgae with Invasive Potential,** Project from the Azores University to identify cryptogenic algae from the Atlantic. Rif is a partner;
- **Antimicrobial resistance in birds from Melrakkaslétta,** project in collaboration with the Moredun Research Institute, Scotland, to apply nanopore sequencing to investigate carriage of microbial risks in Arctic bird species. This project started as INTERACT Remote Access, but will continue in the future;
- **Migratory waders,** register of migratory waders through Melrakkaslétta, from their arrival until depart. Project from Náttúrustofa Norðausturlands;
- **Heathland birds,** register of breeding heathland birds in Melrakkaslétta. Project from Náttúrustofa Norðausturlands;
- **Waterfowl monitoring,** register of breeding waterfowl species on lakes across Melrakkaslétta. Project from Náttúrustofa Norðausturlands;
- **Winter Anatidae,** register of ducks and similar species across the coast of Melrakkaslétta during the winter.



Mallards (*Anas platyrhynchos*).

- The project Coffee Science was submitted to the Northeast Iceland Development Fund.

Deliverables

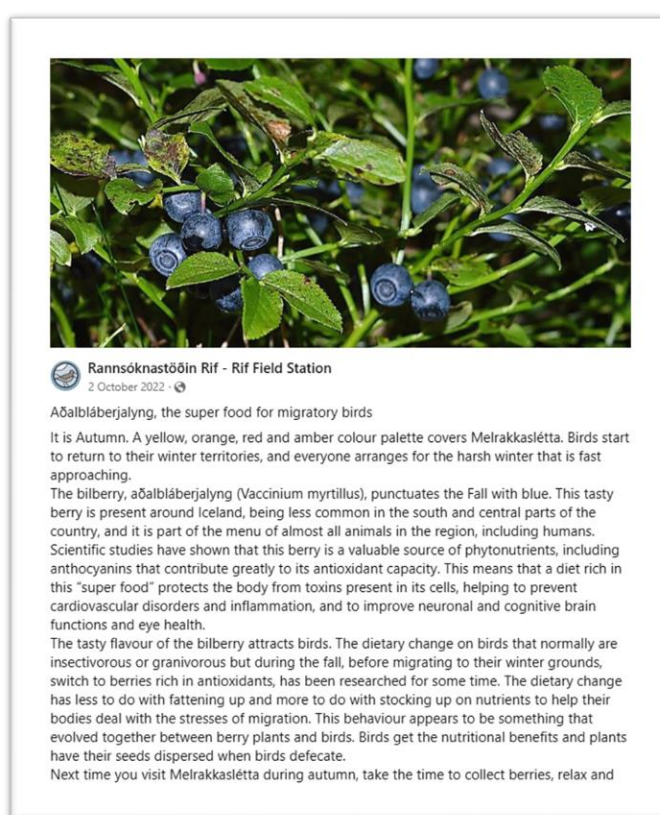
During 2022, several deliverables were achieved:

- Scientific paper published: Micael J, Rodrigues P, Ramos-Esplá A, Gíslason S (2022). Establishment and proliferation under climate change: temperate tunicates in Southwest Iceland. Marine and Freshwater Research. [CSIRO PUBLISHING | Marine and Freshwater Research](#);
- Scientific paper published: Micael J, Denisenko NV, Gíslason S, Guðmundsson G, Kuklínski P, Rodrigues P (2022). Diversity of Bryozoa in Iceland. Polar Biology. [Diversity of Bryozoa in Iceland | SpringerLink](#);
- Scientific manuscript “Climate change: the thriving of temperate tunicates in Southwest Iceland” Submitted to Marine and Freshwater Research;
- Presentation “Monitoring and research in the Icelandic Arctic environment” in the Moredun Foundation, Scotland, 5 of May;
- Presentation “Rif Field Station” in the University of Akureyri for the representatives of Greenland, 10 of May;
- Presentation “An Icelandic field station on the edge of the Arctic Circle”. Greenland-Iceland Research Cooperation Workshop. Nuuk, 25 of August;



Outdoor information about Rif's presentation at the Moredun Foundation, Scotland.

- Article in the Portuguese journal Público “Aves, baleias, “krill”, espécies invasoras e paisagens únicas: investigadores portugueses desbravam o mundo na Islândia”. [Aves, baleias, “krill”, espécies invasoras e paisagens únicas: investigadores portugueses desbravam o mundo na Islândia | Reportagem | PÚBLICO \(publico.pt\)](#);
- Article in the Portuguese journal Público “Aos pés do Ártico e com as alterações climáticas como escritório”. [Aos pés do Ártico e com as alterações climáticas como escritório | Islândia | PÚBLICO \(publico.pt\)](#);
- Twelve different texts about the biodiversity of Melrakkaslétta were written and posted in Rif’s Facebook page on the first day of each month;



One of the texts about the biodiversity of Melrakkaslétta posted in Rif’s Facebook.

- Forty pictures were posted in Rif’s Instagram during the year;
- A call for INTERACT TA/RA was open from 12th September to 15th November;
- Rif Field Station was one of the INTERACT stations of the month, being featured during September on media.

Meetings

During 2022 Rif field station was present in several meetings/workshops:

- January 6. BIODICE Zoom conference “Diversity of life: what is it and why does it matter?”. Presented by Professor Skúli Skúlason;
- January 12 to 14. Zoom meeting “The fantastic Skalanes Life, aquatic & terrestrial kingdom conference”;
- January 18. Online event “Gender Equality in the Arctic”. Series of online events commemorating the 75th anniversary of diplomatic relations between Iceland and Canada in 2022;
- January 31. Meeting with Luisella Bianco, from INTERACT coordination office, to solve some issues in INTERACT 2 financial report;
- February 9. Zoom talk “Climate Change, Species Shifts and the Future Regulation of Marine Living Resources”. Presented by Richard Caddell (Cardiff University), developed by the Faculty of Law, University of Akureyri;
- February 10. Web meeting with students from the Environmental changes at higher latitudes- EnCHiL Nordic Master, from Landbúnaðarháskóli Íslands, who are preparing a workshop on Arctic studies and research opportunities;
- February 23. Webinar “Oceans – The Blue Economy and Innovation”. Developed by the Embassy of Iceland in Ottawa and the Embassy of Canada in Reykjavík in partnership with the Iceland Ocean Cluster and Canada’s Ocean Supercluster;
- February 23. “Arctic Fox Gardens: Vegetation and soil nutrients on fox dens”. Presented by Dominik Arend, who was at Rif during 2021 developing this project in Melrakkaslétta;
- February 28. Arctic Forum Workshop at Landbúnaðarháskóli Íslands. There was a presentation about the Rif Field Station past, present, and future, made by students from the Environmental changes at higher latitudes- EnCHiL Nordic Master;
- March 3. Web presentation “The impact of climate change on the law”. Organized by the Reykjavik University in collaboration with the British Embassy in Iceland and the University of Akureyri;
- March 3. Web seminar “Research and monitoring of Arctic foxes in Iceland”. Organized by the Icelandic Institute of Natural History;
- March 14. “Gender equality and empowerment in the Arctic / UN CSW66 parallel NGO panel”. Event by Norðurslóðanet Íslands / Icelandic Arctic Cooperation Network;
- March 15. Meeting with Jannik Hansen (professor DIS Copenhagen Faculty) to discuss the reception of a group of students from the Polar Biology semester within the Environmental Science of the Arctic Program from DIS Nonprofit Study Abroad Foundation;
- March 17. Lunch-meeting with local entrepreneurs to present the researchers pack to encourage the researchers visiting Rif to use the local services;

- March 17. Web event “Indigenous Knowledge and Western Science: a Conversation with SmartICE”. Organized by Polar Knowledge Canada, Icelandic Arctic Cooperation Network, Embassy of Canada in Reykjavík, and Embassy of Iceland in Ottawa;
- March 29. Web event “Arctic Science Summit Week 2022 – Science Day, current Arctic research addressing global challenges in the future”. Organized by the International Arctic Science Committee;
- April 7. INTERACT webinar about 2022 TA and RA
- April 21. Webinar “Oceanic regime shifts and their impact on the Icelandic marine ecosystem”. ROCS lecture series, BIODICE
- May 2. Meeting with Kim Thompson, the Head of Aquaculture Research of the Moredun Research Institute, Scotland;
- May 3. Meeting with Craig Watkins, Principal Scientist at John’s Disease Group of the Moredun Research Institute, Scotland;
- May 4. Meeting with Karen Keegan, a PhD student that received an INTERACT Remote Access (Project ANSABS - Application of Nanopore sequencing to investigate carriage of microbial risks in Arctic bird species);
- May 5. Meeting with Keith Ballingall, Leader Research Scientist and Eleanor Watson, Researcher Scientist from the Orkney Project (Scottish project in collaboration with Moredun Research Institute), Scotland;
- May 6. Meeting with Nuno Silva, Senior Research Scientist at the Moredun Research Institute, Scotland;
- May 18. Webinar “My Nature and the North / Icelandic & Canadian Literature”. Organized by Polar Knowledge Canada, Icelandic Arctic Cooperation Network, Embassy of Canada in Reykjavík, and Embassy of Iceland in Ottawa;
- May 24. “First general assembly of INPA (INTERACT Non-Profit Association);
- August 16. Meeting in Raufarhöfn with the workers from SSNE (Samtök sveitarfélaga og atvinnuþróunar á Norðurlandi eystra), to present Rif Field Station and its projects;
- August 17. Meeting in Raufarhöfn with Katrín Sigurjónsdóttir, Mayor of Norðurþing Municipality, to present Rif, its projects and needs;
- August 25 - 26. Iceland-Greenland Arctic Research Cooperation Workshop. Greenland-Iceland Research Cooperation Workshop. Nuuk, Greenland;
- August 29 - 30. Workshop about monitoring of intertidal biodiversity. Southwest Iceland Nature Research Centre;
- September 8. Web meeting with the INPA board to discuss the entering of Rif Field Station on the Arctic Passion Project (EU funded project) - Arctic PASSION;

- September 16. Web meeting with Caroline Coch (Arctic Passion senior project manager) to define what new material Rif will need to measure new climate variables;
- September 28. Meeting Icelandic Institute of Natural History/Nature Research Centres. Borgarnes;
- October 14. Meeting with researchers from the Moredun Research Institution to develop the project “ANSABS - Application of Nanopore sequencing to investigate carriage of microbial risks in Arctic bird species”;
- October 19. Arctic Passion meeting with the project manager and other field stations;
- October 31. Meeting with Konrad Kandler, Darmstadt University, Germany, about the project HiLDA (Iceland as a model for high-latitude dust sources);
- November 3. INPA web meeting with all ten INTERACT stations from Arctic Passion project to discuss which parameters will be monitoring;
- November 11. Meeting with Ari Páll Pállsson and Hildur Hallsórsdóttir from SSNE to present the project “Coffee Science”, and to get help on the submission to the Northeast Iceland Development Fund;
- November 14. Meeting with Angelina Lo Giudice, researcher from the Institute of Polar Sciences of the Italian National Research Council about their INTERACCESS project;
- November 15. Meeting with researchers from the Moredun Research Institution, Scotland, about their INTERACCESS project;
- December 7. Web workshop “Passive Samplers for Arctic Pollution”. Organized by the Interact Pollution Network;
- December 9. Web meeting with the technicians of Volue, the company that is selling and give support for the dataloggers to Arctic Passion Project.

INTERACT

- Interact annual meeting in Keflavik (26th to 29th September);
- Rif received one Transnational Access project: “Campylobacter in arctic birds as an indicator of global spread of antimicrobial resistant zoonotic pathogens”, and one Remote Access project “Application of nanopore sequencing to investigate carriage of microbial risks in Arctic bird species”;
- Rif is one of the founding stations of INPA - INTERACT Non-Profit Association



INTERACT annual meeting in Keflavík, Iceland.