

Appendix IV

Research Collaboration on Scientific Articles

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Introduction

This article explores Norway's research collaboration with the U.S. and Canada on the basis of some 9000 scientific articles published from 1981 to 2002 featuring at least one author who resides in Norway and at least one who resides in one of the two other countries. The articles' bibliographical data have been used to analyze or learn about:

- The place of the U.S. and Canada in Norway's international collaboration profile;
- The subject profile of the research collaboration with the U.S. and Canada;
- Norway's most important partner institutions in the U.S. and Canada;
- The most important partner institutions in Norway;
- Enterprises in Norway engaged in research collaboration in the U.S. and Canada.

When two or more researchers publish a scientific article together and specify different institutional addresses in the publication, research collaboration between the institutions can be traced through the article's bibliographical data. These institutional addresses may be in different countries. In such case, the article bears witness to international research collaboration.

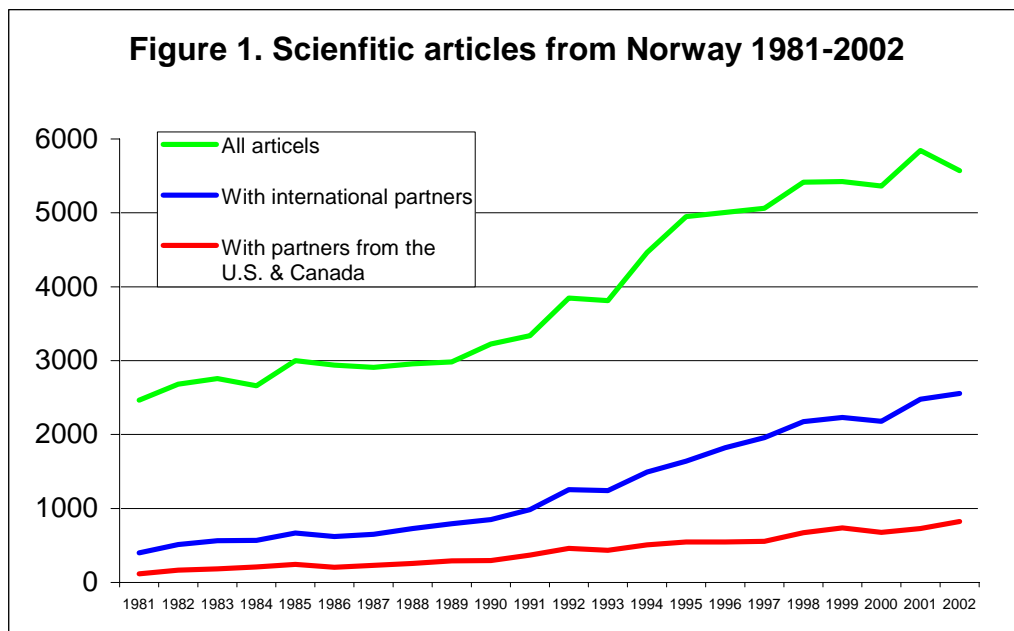
Articles resulting from international collaboration usually originate from research collaboration at the 'basic level': Researchers choose their own partners in their own networks of specialists in different countries with whom they share expertise, data, methods, resources, etc. However, such individual choices may be affected by international collaboration agreements or research programs that stimulate or call for cross-border collaboration. Funding to take part in conferences and to work or train abroad may also have an impact on researchers' personal networks. While data on the financial incentives for international research collaboration can be elicited from the central sources of funding, the data in this article offer a deeper understanding of the collaboration that takes place at the level on which the research is conducted and the publications are written. At that level, it is possible to explore in greater detail trends in collaboration, subject profiles and the frequency of interaction between institutions and countries.

International collaboration in scientific articles is commonplace. In recent years, between 40 and 50 per cent of all scientific articles that have been registered with a Norwegian author's address by the *Institute for Scientific Information* in the U.S. (ISI) have also had an author's address in one or more other countries. Between 1981 and 2002, the Norwegian Institute for Studies in Research and Higher Education (NIFU) received bibliographical data from ISI covering 9 251 articles that featured an author's address in Norway appearing in combination with authors' addresses in the U.S. and/or in Canada. These articles account for roughly one-third of all 'Norwegian' articles resulting from international collaboration during the period, and 11 percent of all Norwegian articles as a whole.

This article analyzes Norway's collaboration with the U.S. and Canada by taking a closer look at the subject profiles and institutional affiliations reflected in the more than 9 000 joint articles published from 1981 to 2002. First, we will point out some general development trends and show which role the U.S. and Canada have played in the general collaboration profile for Norwegian research at the article level.

The role of the U.S. and Canada in Norway's collaboration profile

Figure 1 shows the numbers per year for the three categories of ISI articles: 1) All Norwegian articles, 2) the share of them involving international collaboration, and 3) the share of them involving collaboration with the U.S. and/or Canada.



The number of articles featuring Norwegian authors' addresses in combination with authors' addresses in the U.S. and/or Canada rose from 117 in 1981 to 826 in 2002. The increase should be considered against the background of a general doubling in the number of ISI articles during the same period. Meanwhile, the share of articles resulting from international collaboration increased from 16 per cent in 1981 to 46 per cent in 2002. Both increases are commensurate with an international trend: Most countries with which Norway can be compared have experienced similar increases in the number of ISI articles and in the share of them that indicate international collaboration.

As mentioned earlier, the U.S. and Canada account for roughly one-third of all Norwegian articles resulting from international collaboration. Although this percentage has remained relatively stable, it was somewhat higher during the first decade than more recently. This means that collaboration with the U.S. and Canada, relatively speaking rather than in the number of articles, has diminished slightly in importance in Norwegian researchers' general collaboration profile. This tendency was examined more closely (in slightly more limited material) in the article "EU research is changing Norway's collaboration profile" (in Norwegian) by Liv Langfeldt and Gunnar Sivertsen in *Forskningspolitikk (Research Policy)* 1/2003.¹). The deterioration is related to Norway's collaboration profile becoming broader (encompassing more countries) and that collaboration with the EU states has become a more prominent feature of the profile. Traditionally, a great deal of the research from Norway was published in collaboration with researchers in the U.S. Until the mid-1990s when Finland and Sweden joined the EU, Nordic collaboration was also strong. Norwegian researchers found partners for their scientific articles in Sweden and Denmark in particular. Outside the Nordic countries, Norwegian collaboration concentrated on interaction with researchers in Great Britain and Germany. However, Norway's traditional collaboration profile has changed over the past decade. A larger number of EU states are making their marks on the profile, while collaboration with the Nordic countries and the U.S. has diminished in relative importance.

¹ Internet version: <http://www.nifu.no/fpol/1-2003/art9.html>

Notwithstanding, the U.S. is still the country that occurs most frequently by far in Norwegian researchers' collaboration patterns; see *Table 1*. Please note, however, that the U.S. also has the most ISI articles of all countries. The role the U.S. plays in Norway's collaboration profile, 29 per cent, corresponds almost exactly with the proportion of the world's ISI articles attributed to the U.S.² Canada accounts for a larger percentage of Norwegian joint articles, 5 per cent, than its world production of ISI articles: 4 per cent. Still, the difference is not large. Sweden and Denmark account for significantly greater shares of Norwegian joint articles than of the world's ISI articles, while Japan is a clear example of the opposite.

Table 1. The 16 most frequent countries in Norway's collaboration profile. Numbers and percentages from 1981 to 2002, as well as the number during the former and latter halves of the period. Growth factor = the number for 1992 to 2002 divided by the number for 1981 to 1991.

	Total number	Percentage*	1981-1991	1992-2002	Growth factor
U.S.	8 241	29.0%	2 299	5 942	2.6
Sweden	5 980	21.1%	1 521	4 459	2.9
Great Britain	4 802	16.9%	1 069	3 733	3.5
Germany	3 504	12.3%	795	2 709	3.4
Denmark	3 385	11.9%	745	2 640	3.5
France	2 589	9.1%	436	2 153	4.9
The Netherlands	1 964	6.9%	294	1 670	5.7
Finland	1 888	6.7%	302	1 586	5.3
Italy	1 542	5.4%	224	1 318	5.9
Canada	1 432	5.0%	329	1 103	3.4
Russia	1 304	4.6%	111	1 193	10.7
Switzerland	1 262	4.4%	249	1 013	4.1
Spain	965	3.4%	62	903	14.6
Belgium	926	3.3%	148	778	5.3
Poland	856	3.0%	164	692	4.2
Japan	776	2.7%	113	663	5.9
All joint articles*	28 382	100.0%	7 348	21 034	2.9
* The sum of the countries' percentages of all joint articles exceeds 100 because of overlapping due to multilateral collaboration.					

The column all the way to the right in *Table 1* shows the 'growth factor' estimated as the number during the period from 1992 to 2002 divided by the number during the period from 1981 to 1991. Generally speaking, there were 2.9 times as many joint articles during the latter half of the period. The growth factor for the U.S. was lowest, with 2.6. Canada also had relatively slow growth, with 3.4. The figures here show the same thing that was mentioned above: Norway's collaboration profile has become broader, expanding in particular in relation to EU states with which it had little collaboration earlier. The growth has slowed down in relation to the U.S. and Canada and Norway's closest neighboring countries.

By way of introduction, it was mentioned that 9 251 articles featured authors' addresses in Norway appearing in combination with authors' addresses in the U.S. and/or Canada. However, the figures for the U.S. and Canada in the table add up to 9 673 articles. This is because both countries appear in the authors' addresses in 422 articles. More generally, articles based on *multilateral* collaboration (at least three countries) are accounting for an increasing share of all joint articles that can be linked to Norway through the authors' addresses. They aggregated 17 per cent of all joint articles in 1981 and 38 per cent in 2002. In joint articles, certain countries,

² The Research Council of Norway: *The Norwegian Research and Innovation System – Statistics and Indicators 2001*, p. 159.

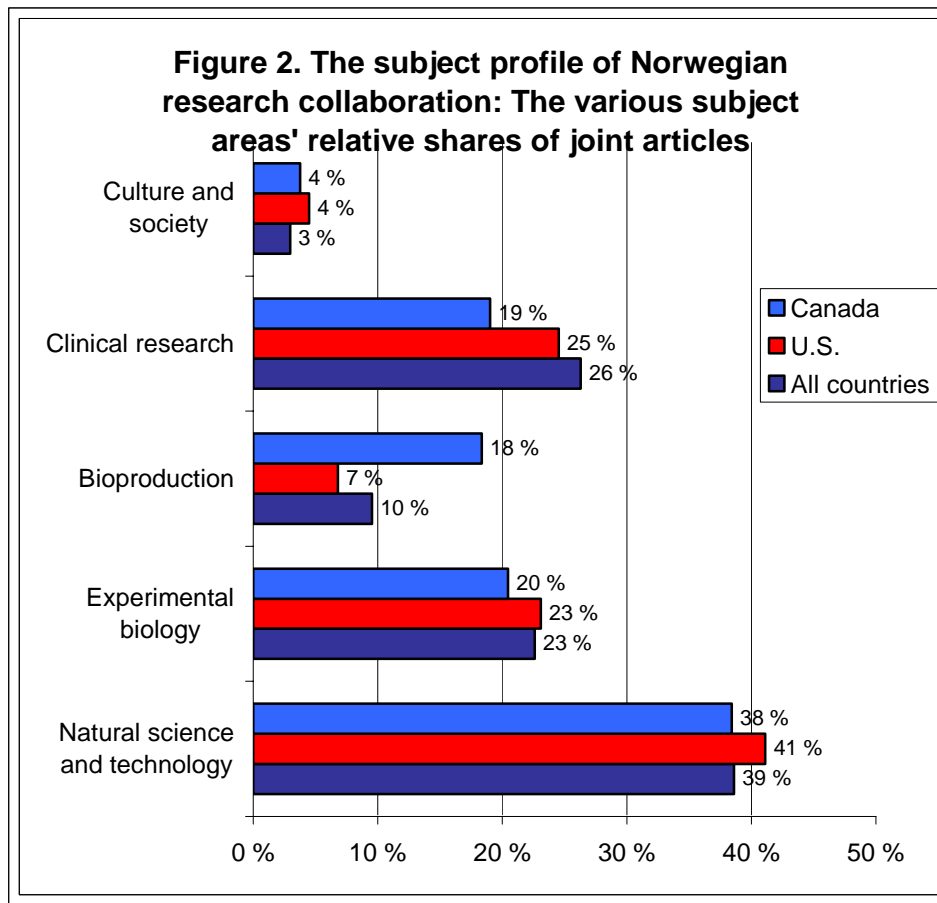
e.g. Switzerland, Belgium, Italy and Finland, appear far more frequently in articles resulting from multilateral collaboration than in articles resulting from bilateral collaboration. However, the U.S. and Canada are not among these countries. They engage in bilateral collaboration to a greater extent. This means the U.S. and Canada *more frequently act independently of each other* than together in joint articles with Norway. The 422 'overlapping' joint articles account for 5 per cent of all Norway's joint articles with the U.S. and 29 per cent its joint articles with Canada.

The subject profile of Norwegian collaboration

To reveal the subject profile of Norway's research collaboration with the U.S. and Canada, the joint articles were divided into five main subject areas, see *Figure 2*. The division into subject areas was performed by categorizing the journals in which articles were published. The five subject areas are:

- *Culture and society*: The humanities, social sciences, law, theology.
- *Clinical research*: Clinical medicine, veterinary science, odontology and psychology.
- *Bioproduction*: Nature research, agricultural science and fisheries biology.
- *Experimental biology*: Laboratory-based biological and biomedical research, and pharmacology.
- *Natural science and technology*: Physics, chemistry, geo-sciences, technology and mathematics.

Figure 2 shows the subject profile broken down by subject areas for Norwegian joint articles in three contexts: the total for all countries, for the U.S. in particular and for Canada in particular. As the figure indicates, the largest number of joint articles is published in science and technology subjects and the least in culture and society. However, the latter subject area also features international publications in book form and in journals not covered by the ISI. In these subjects, the present data cover only a limited share of the publication that takes place in collaboration with researchers from other countries.



The most important information in *Figure 2* is the way in which the subject profiles in Norway's relations with the U.S. and Canada deviate from the general profile for all countries collectively:

- The subject profile for Norway's relations with the U.S. indicates that there are relatively many joint articles in science and technology, experimental biology and culture and society.
- The subject profile for Norway's relations with Canada is, on the other hand, characterized by relatively many articles in the field of bioproduction, i.e. nature research, agricultural science and fisheries biology.

Norway's research collaboration with the U.S. and its collaboration with Canada have somewhat different subject profiles. However, *Figure 2* does not show the relative importance Norway's collaboration with the two countries within the individual subject area. On that account, *Table 2* also shows the relative share of all co-authored articles resulting from international collaboration in the subject areas exemplifying collaboration with the U.S. and/or Canada. This calculation is independent of the size of the subject area as reflected by the number of articles. Thus it was possible to demonstrate that collaboration with the U.S. in particular has great relative importance for culture and society. No less than 44 per cent of all articles resulting from international collaboration in that subject area are based on collaboration with the U.S. Otherwise, the table confirms that the U.S. has relatively (given the country's importance in other subject areas) little importance for Norwegian researchers' international collaboration in bioproduction, while the opposite is true for Canada.

Table 2. The 30 periodicals appearing most frequently in connection with Norwegian collaboration with the U.S. Number of articles per journal throughout the period from 1981 to 2002.

Subject area	U.S.	Canada	U.S. & Canada
Culture and society	43.9%	6.6%	50.5%
Clinical subjects	27.1%	3.7%	30.8%
Bioproduction	20.6%	9.9%	30.6%
Experimental biology	29.6%	4.7%	34.3%
Science and technology	30.9%	5.1%	36.0%

To give a better impression of which subjects are especially frequent in Norway's collaboration profiles, two tables have been compiled, i.e. one for the U.S. and one for Canada, showing which 30 journals have published the most articles in each of these contexts. *Table 3* shows the results for the U.S. Journals in physics, astrophysics and geophysics are especially frequent, followed by journals in experimental biology and basal medicine.

Table 3. The 30 periodicals appearing most frequently in connection with Norwegian collaboration with the U.S. The number of articles per journal throughout the period from 1981 to 2002.

Journals	Articles
Physics Letters B	166
Zeitschrift für Physik C-Particles and Fields	84
Journal of Geophysical Research-Space Physics	83
Astrophysical Journal	69
Journal of Molecular Structure	66
Proceedings of the National Academy of Sciences of the United States of America	62
Journal of Biological Chemistry	62
Physical Review B	56
Physical Review Letters	56
Geophysical Research Letters	55
Journal of Chemical Physics	46
Nature	45
Nuclear Physics A	44
Astronomy & Astrophysics	42
European Physical Journal C	41
International Journal of Cancer	41
Cancer Research	40
Journal of Immunology	37
Journal of the American Chemical Society	36
Journal of Geophysical Research-Atmospheres	34
Acta Physiologica Scandinavica	34
American Journal of Human Genetics	32
Science	32
Blood	32
Journal of Clinical Microbiology	32
Infection and Immunity	31
Physical Review C	31
Journal of Physical Chemistry	30
Physical Review A	29
Scandinavian Journal of Immunology	29

As mentioned, the point of showing the journals in *Table 3* is to give a more detailed impression of which subjects or specialties are the focus of extensive collaboration with the U.S. For the same purpose, *Table 4* shows the 30 journals with the highest joint publication frequency in relation to Norway and Canada. The figures in this table are not directly comparable with the figures in *Table 3*, since joint articles with Canada are less frequent. However, the list of the most frequent journals does give a clearer impression of the kind of research covered by the term 'bioproduction' in this context. The journals that published a particularly large number of joint articles between researchers in Norway and Canada are often those in fields such as fisheries biology, oceanography, ecology, environmental research and zoology. (The other journals in *Table 4* also show a high frequency in *Table 3* for the U.S.)

Table 4. The 30 journals most frequently featuring joint articles between Norway and Canada. Number of articles per journal throughout the period from 1981 to 2002.

Journals	Articles
Canadian Journal of Fisheries and Aquatic Sciences	36
Canadian Journal of Zoology-Revue Canadienne de Zoologie	25
Nuclear Physics A	21
Physical Review Letters	19
Nature	13
Lancet	13
ICES Journal of Marine Science	12
Journal of Geophysical Research-Atmospheres	11
Marine Ecology-Progress Series	11
Polar Biology	10
Sarsia	10
Canadian Geotechnical Journal	9
Aquaculture	9
American Journal of Human Genetics	9
Physical Review D	9
Molecular Ecology	8
Oikos	8
Journal of Zoology	8
New England Journal of Medicine	7
Animal Genetics	7
International Journal of Cancer	7
Environmental Science & Technology	7
Journal of Fish Biology	7
Water, Air and Soil Pollution	7
Journal of Geophysical Research-Space Physics	7
Physical Review B	7
American Journal of Cardiology	6
Physica Scripta	6
Annales Geophysicae	6
Marine Policy	6

Partner institutions in the U.S. and Canada

We have examined which institutions in the U.S. and Canada appear most frequently in the authors' addresses in articles published jointly with researchers in Norway. The result is shown in *Table 5*, which ranks the 50 most frequently mentioned institutions in each country by the number of articles from 1981 to 2002. The names of the institutions are stated as published in the address of the journals and with the standard abbreviations used by ISI, although in some cases, variations of the same institution name have been merged. Please note that the number of articles per partner institution reflects not only its frequency of collaboration with Norway, but also the institution's size, as measured by the volume of ISI articles. In addition, an evaluation of *Table 5* requires knowledge of the U.S. and Canadian research systems at the institutional level. Accordingly, the results will not be discussed in this context.

Partner institutions in Norway

At NIFU, all ISI articles are broken down by institutions as specified in NIFU's register of institutions. Articles from universities are broken down to faculty level; otherwise the institution *per se* is the unit used for the analysis. We have examined how joint articles with the U.S. or Canada break down by institution in Norway. *Table 6* shows the number of joint articles with the U.S. from 1981 to 2002 for the 16 Norwegian institutions that produced the most articles of this type. The table also indicates the three institutions in the U.S. with which each of the 16 institutions has the most joint articles. *Table 7* shows the comparable figures for Canada. The results are roughly the same for Norway's four universities and their faculties, while the largest scientific university colleges and the natural science and technical-industrial institutes figure somewhat differently in the two tables. Please note that the number of articles per partner institution reflects not only the frequency of its collaboration with Norway, but also the institution's size, as measured by the volume of ISI articles.

Norwegian enterprises that cooperate with researchers in the U.S. and Canada

A total of 506 articles from 1981 to 2002 are registered with a combination of authors' addresses in the U.S. and Canada and addresses of enterprises in the private sector in Norway. *Table 8* shows the number of articles per enterprise that has published three or more such articles during the period. Most of the articles are concentrated on a relatively small number of enterprises that generally also account for high relative shares of the Norwegian ISI articles from the private sector.

Table 5. The 50 institutions in the U.S. and Canada most frequently featuring co-authorship with researchers in Norway. The number of articles per institution throughout the period from 1981 to 2002. ISI's abbreviations have been used.

Institution in the U.S.	Articles	Institution in Canada	Articles
Univ Washington	311	Univ British Columbia	124
Iowa State Univ Sci & Technol	296	Univ Toronto	113
Univ Texas	253	Mcgill Univ	94
Univ Minnesota	248	Univ Alberta	82
Harvard Univ	246	Fisheries & Oceans Canada	79
Stanford Univ	216	Mcmaster Univ	69
Univ Calif Berkeley	213	Univ Waterloo	64
Univ Calif San Diego	188	Univ Calgary	56
Univ Michigan	168	Univ Saskatchewan	55
Univ Colorado	160	Univ Wester Ontario	54
Univ Maryland	155	Univ Montreal	53
Univ Wisconsin	154	Mem Univ Newfoundland	44
Columbia Univ	150	Univ Guelph	40
Univ Calif Los Angeles	127	Dalhousie Univ	39
Univ Calif Irvine	125	Univ Victoria	39
NCI (National Cancer Institute)	118	Univ Laval	38
Univ Iowa	118	Queens Univ	37
Univ Alaska	112	Geol Survey Canada	36
Cornell Univ	111	Univ Ottawa	27
MIT	108	Triumf	26
NASA	108	Agr & Agri Food Canada	21
Oregon State Univ	104	Univ Quebec	21
Univ Calif Davis	102	British Columbia Canc Agcy	20
Univ Pen	101	Univ Manitoba	20
Univ Illinois	99	Environm Canada	17
Suny Stony Brook	96	Ontario Canc Treatment & Res Fdn	17
Univ So Calif	87	Atmospher Environm Serv	16
Caltech	86	Inst Maurice Lamontagne	16
Univ Florida	86	Natl Res Council Canada	15
Brookhaven Natl Lab	85	Carleton Univ	13
Univ Massachusetts	85	Hosp Sick Children	13
Univ Calif San Francisco	83	Canada Ctr Remote Sensing	12
Yale Univ	83	Royal Ontario Museum	12
Univ N Carolina	81	Canadian Wildlife Serv	11
Univ Pittsburgh	81	York Univ	10
Duke Univ	80	Chu Laval	9
US Navy	77	Simon Fraser Univ	9
Johns Hopkins Univ	75	Alberta Canc Board	8
Ohio State Univ	73	Bedford Inst Oceanog	8
Vanderbilt Univ	73	Ontario Minist Environm	8
Univ Oregon	71	Univ Sherbrooke	8
Princeton Univ	67	CHUL Res Ctr	7
Univ Virginia	67	Concordia Univ	7
Michigan State Univ	66	Montreal Gen Hosp	7
Natl Ctr Atmospher Res	66	Mt Sinai Hosp	7
Univ Calif Santa Barbara	66	Princess Margaret Hosp	7
Univ Tennessee	65	Trent Univ	7
Penn State Univ	64	Commun Res Ctr	6
National Oceanic and Atmospheric Adm	62	Foothills Prov Gen Hosp	6
Univ Georgia	62	Manitoba Canc Treatment & Res Fdn	6

Table 6. The 16 institutions in Norway featuring the most co-authorship with researchers in the U.S., and the three most frequently mentioned institutions in the U.S. for each of them. The number of articles per institution throughout the period from 1981 to 2002. ISI abbreviations have been used for institutions in the U.S.

Institution in Norway	Articles with the U.S.	Institutions in the U.S	Articles per institution
University of Oslo - Faculty of Mathematics and Natural Sciences	1 065	Iowa State Univ Sci & Technol Iowa State Univ Natl Ctr Atmospher Res	125 89 42
University of Oslo - Faculty of Medicine	982	Harvard Univ Univ Michigan Univ Texas	52 43 42
University of Bergen - Faculty of Mathematics and Natural Science Faculty	660	Iowa State Univ Sci & Technol Iowa State Univ Harvard Univ	131 106 45
University of Bergen - Faculty of Medicine	469	Univ Minnesota Duke Univ Harvard Univ	32 31 23
University of Tromsø - Faculty of Medicine	218	Univ Texas Harvard Univ Univ Cincinnati	13 12 11
Norw. Univ. of Science and Technology - Faculty of Information Technology, Mathematics and Electrical Engineering	212	Suny Stony Brook Univ Missouri Univ Calif Irvine	21 12 12
Norw. Univ. of Science and Technology – Faculty of Medicine	196	Boston Univ Univ Minnesota Univ Calif San Diego	12 10 10
University of Tromsø - Faculty of Mathematics and Natural Science Faculty	188	Univ Texas Univ Calif San Diego Florida Inst Technol	15 14 11
Norw. Univ. of Science and Technology -Departments of Chemistry and Biology	179	Oregon State Univ Colgate Univ Univ Virginia	12 9 8
Agricultural University of Norway	165	Washington State Univ Agricult Res Service Univ Illinois	15 10 10
National Institute of Public Health	145	Univ Washington Ctr Dis Control & Prevent Johns Hopkins Univ	18 12 8
The Norwegian School of Veterinary Science	91	Univ Calif Davis Ctr Dis Control Michigan State Univ	16 9 7
Norwegian Defence Research Establishment	80	Univ Colorado US Navy Univ Washington	17 13 7
Geological Survey of Norway	76	Univ Massachusetts Univ Michigan Indiana State Univ	13 13 10
SINTEF	74	Brookhaven Natl Lab Lehigh Univ Univ Maryland	6 3 3
Norw. Univ. of Science and Technology – Department of Electronics and Telecommunications	68	Univ Calif Irvine Univ Virginia Harvey Mudd Coll	22 7 7

Table 7. The 16 institutions in Norway featuring the most co-authorship with researchers in Canada, and the three institutions in Canada mentioned most frequently for each of them. The number of articles per institution throughout the period from 1981 to 2002. ISI abbreviations have been used for institutions in Canada.

Institution in Norway	Articles with Canada	Institution in Canada	Articles per inst.
University of Oslo - Faculty of Medicine	171	Univ Toronto Univ Alberta Mcgill Univ	23 15 13
University of Bergen - Faculty of Mathematics and Natural Science Faculty	117	Univ British Columbia Mcgill Univ Univ Montreal	34 25 24
University of Oslo - Faculty of Mathematics and Natural Science Faculty	101	Univ Alberta Univ Toronto Univ British Columbia	12 10 9
University of Bergen - Faculty of Medicine	60	Mcgill Univ Univ Toronto St Michaels Hosp	16 10 2
Institute of Marine Research	50	Fisheries & Oceans Canada Dalhousie Univ Univ British Columbia	18 7 7
Norwegian Polar Institute	42	Univ Waterloo Univ Alberta Inst Maurice Lamontagne	12 10 8
Foundation for Natural Research and Cultural Heritage Research	36	Univ Waterloo Univ Toronto Fisheries & Oceans Canada	11 8 5
Norw. Univ. of Science and Technology - Faculty of Medicine	33	Mcgill Univ Queens Univ Univ Toronto	8 6 4
Norw. Univ. of Science and Technology –Departments of Chemistry and Biology	32	Queens Univ Univ British Columbia Univ Western Ontario	5 5 4
University of Tromsø - Faculty of Mathematics and Natural Science Faculty	31	Univ Saskatchewan Univ Western Ontario Univ Calgary	16 7 3
University of Tromsø - Faculty of Medicine	31	Mcmaster Univ Univ Calgary Univ Alberta	11 7 2
SINTEF	30	Queens Univ Univ Saskatchewan Univ Montreal	6 5 3
Norwegian Institute for Air Research	29	Atmospher Environm Serv Environm Canada Univ Toronto	11 4 3
Geological Survey of Norway	28	Geol Survey Canada Univ Calgary Univ Quebec	14 5 5
The Norwegian School of Veterinary Science	27	Univ Saskatchewan Univ Guelph Univ Laval	9 8 2
Agricultural University of Norway	24	Univ Saskatchewan Univ British Columbia Agr Canada	5 4 2

Table 8. Enterprises in Norway with three or more co-authorships with researchers in the U.S. and Canada. The number of articles per institution throughout the period from 1981 to 2002. ISI's abbreviations have been used.

Enterprise	U.S.	Canada	Total
STATOIL	68	6	74
NORSK HYDRO ASA	43	23	66
NYCOMED IMAGING AS	50	6	56
SAGA PETR ASA	21	12	33
DET NORSKE VERITAS	15	0	15
AKVAPLAN NIVA	8	6	14
TELENOR RES & DEV	9	2	11
ELKEM RES	7	2	9
IBM CORP	6	2	8
CONOCO NORWAY INC	6	1	7
NORWEGIAN TELECOM RES	5	2	7
PHILLIPS PETR CO	7	0	7
ESSO NORGE AS	5	1	6
HAFSLUND PHARMA SA	6	0	6
MOBIL EXPLORAT NORWAY INC	6	0	6
BP AMOCO NORGE AS	5	0	5
KVAERNER	3	2	5
BIOMAR AS	4	0	4
CORROCEAN ASA	4	0	4
DYNAL AS	3	1	4
GENO	1	3	4
GEOLAB NOR	4	0	4
NAT LIPIDS LTD	3	1	4
NORWEGIAN DAIRIES ASSOC	2	2	4
NORWEGIAN SPACE CTR	4	0	4
NORWEGIAN UNDERWATER TECHNOL CTR	2	2	4
PRONOVA BIOCARE	4	0	4
SIMRAD AS	4	0	4
TINE NORWEGIAN DAIRIES BA	0	4	4
AS GEOCONSULT	3	0	3
AS OLIVIN	3	0	3
AXIS BIOCHEM	3	0	3
AXIS SHIELD ASA	3	0	3
BATHYBIOL AS	3	0	3
NORDIC VLSI INC	3	0	3
OCEANOR	2	1	3
PGS RESERVOIR	3	0	3
VESO VIKAN AKVAVET	3	0	3