

# **Departments of Biological and relevant Biochemical disciplines at Norwegian Universities**

**Expenditure on Research and Experimental Development (R&D)**

**Academic staff**

Data from Norwegian R&D Statistics 1995 and 1997

Commission from the Science and Technology Division  
at the Research Council of Norway



Norsk institutt for studier  
av forskning og utdanning

Hegdehaugsveien 31, N-0352 Oslo, Norway

# CONTENTS

INTRODUCTION .....	2
R&D EXPENDITURE.....	6
R&D PERSONNEL .....	16

## Tables

Table 1	R&D expenditure in biological and relevant biochemical disciplines in relation to total R&D expenditure in 1995 and 1997. (NOK million).....	6
Table 2	R&D expenditure on total current costs and scientific equipment by main source of funding in the HES in 1997. (NOK million).....	7
Table 3	R&D expenditure on current costs and scientific equipment at university departments of biological and relevant biochemical disciplines by main source of funding in 1997 (NOK million).....	7
Table 4	R&D expenditure financed by GUF for current costs and scientific equipment at university departments of biological and relevant biochemical disciplines in 1997. (NOK million).....	9
Table 5	Direct/external funding on R&D at university departments of biological and relevant biochemical disciplines by source of funds in 1997. (NOK million).....	11
Table 6	Direct/external funding on R&D at university departments of biological and relevant biochemical disciplines, medicine and natural sciences by source of funds in 1997. Per cent.....	13
Table 7	Current expenditures by type of activity at university departments of biological and relevant biochemical disciplines in 1997. Per cent, rounded off to closest 5.....	13
Table 8	Current expenditures by type of activity for medicine, natural sciences and total HES in 1997. Per cent.....	15
Table 9	Academic staff at university departments of biological and relevant biochemical disciplines in relation to total academic staff at the universities in 1995 and 1997.....	16
Table 10	Academic staff at university departments of biological and relevant biochemical disciplines by institution and professional rank in 1997.....	16

## Appendix

Expenditure on Research and Experimental Development (R&D) Academic staff Data from Norwegian R&D Statistics 1995.....	19
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## Introduction

The following presents tables on R&D expenditure and scientific personnel at units dealing with biological and relevant biochemical disciplines at four universities of Norway. The units may be called university departments of *biological and relevant biochemical disciplines* in the sense that most of their R&D activities are related to biological and relevant biochemical disciplines. The 64 units included are<sup>1</sup>:

### University of Oslo:

*The Biotechnology Centre of Oslo*

Faculty of Mathematics and Natural Sciences

*Department of Biology*

*Division of Botany and Plant Physiology*

*Division of General Genetics*

*Division of Marine Zoology and Marine Chemistry*

*Division of Marine Botany*

*Division of Limnology*

*Division of Molecular Cell Biology*

*Division of General Physiology*

*Division of Zoology*

*University Botanical Garden and Museum*

*Zoological Museum*

*Department of Biochemistry*

*School of Pharmacy - Section of Microbiology*

Faculty of Medicine

*Institute of Basic Medical Sciences*

*Department of Anatomy*

*Department of Physiology*

*Department of Medical Biochemistry*

*Department of Neurophysiology*

*Neurochemical Laboratory*

*The group of Institutes within Oslo City Hospitals*

*Institute for Experimental Medical research*

Faculty of Dentistry

*Department of Oral biology*

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<sup>1</sup> The selection of the 64 units was undertaken by the Science and Technology Division at the Research Council of Norway. The units included in this paper are classified within natural sciences and medicine in national R&D statistics. In addition one unit is classified within technology and one within agricultural and veterinary sciences.

**University of Bergen**

Faculty of Mathematics and Natural Sciences

*Department of Molecular Biology*

*Department of Botany (incl. museum)*

*Department of Fisheries and Marine Biology*

*Department of Microbiology*

*Department of Zoology (incl. museum)*

*Centre for studies of Environment and Resources*

Faculty of Medicine

*The Gade institute - Department of Microbiology and Immunology*

*Department of Physiology*

*Department of Anatomy and Cell Biology*

*Department of Biochemistry and Molecular Biology*

*Department of Clinical Biochemistry*

*Department of Paediatrics (incl. med. genetics and clinical molecular medicine)*

**Norwegian University of Science and Technology (NTNU)**

Faculty of Chemistry and Biology

*Department of Botany*

*Department of Zoology*

*Department of Biotechnology*

Faculty of Medicine

*Department of Physiology and Biomedical Engineering, Group of Physiology*

*Department of Cancer Research and Molecular Biology*

*Department of Morphology*

*UNIGEN - Centre for Molecular Biology*

*Department of Natural History, Museum of Natural History and Archaeology*

*Botanical Section, Museum of Natural History and Archaeology*

*Trondhjem Biological Station, Museum of Natural History and Archaeology*

*Zoology Section, Museum of Natural History and Archaeology*

**University of Tromsø**

Faculty of Mathematics and Natural Sciences

*Department of Biology*

*Tromsø Museum, Botanical Department*

*Tromsø Museum, Zoology Department*

Faculty of Medicine

*Department of Medical Biology*

*Department of Arctic Biology/Zoophysiology*

*Department of Biochemistry*

*Department of Biotechnology*

*Department of Gene Biology*

*Department of Immunology*

*Department of Medical Biochemistry*

*Department of Medical Physiology*

*Department of Medical Microbiology*

*Department of Molecular Cell Biology*

*Department of Virology*



*Department of Molecular Genetics*  
Norwegian College of Fishery Science  
*Department of Marine Biochemistry*  
*Department of Marine and Freshwater Biology*  
*Department of Aquatic Resources and Environmental Biology*

**The University Courses on Svalbard, Biology<sup>2</sup>**

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<sup>2</sup> Only part of the activities at The University Courses on Svalbard (UNIS) is related to biology. The R&D expenditure is estimated as part of the total expenditures in the unit, based on the number of scientific personnel involved in biology.

## R&D expenditure

Norwegian R&D statistics for 1997 were completed in February 1999. The figures in this presentation are based on the R&D statistics in the Higher Education Sector (HES). In the following tables we present data on R&D expenditure within the biological and relevant biochemical disciplines as part of the HES, and data on R&D expenditure within the 64 units dealing with biological and relevant biochemical disciplines, mainly from the R&D statistics for 1997. Tables of R&D expenditure for 1995 are presented in the appendix.

TABLE 1  
R&D expenditure in biological and relevant biochemical disciplines in relation to total R&D expenditure in 1995 and 1997. (NOK million).

Category	1995	1997	Change in per cent
Total R&D expenditure in Norway	15 970	18 244	14 %
Of which Higher Education Sector	4 139	4 846	17 %
Of which medicine	1 075	1 329	24 %
Of which natural sciences	1 070	1 223	14 %
Of which biology	233	242	4 %
The 64 selected units in this paper	511	579	13 %

Source: NIFU

Table 1 shows that there has been an increase in total R&D expenditure in Norway from 1995 to 1997. This presents a 6,5 per cent increase in fixed prices. In the HES the increase in fixed prices was 9 per cent from 1995 to 1997. In the national R&D statistics, biology as a field of subject does not cover as many units as selected in this paper. Table 1 shows that the increase in R&D expenditures has been higher within the selected units than within the units classified as biology in the national R&D statistics. The highest increase in total R&D expenditure was within medicine.

There are two main sources of funds for R&D; general university funds (GUF) and direct, external funding. Direct, external funding may take the form of contracts, grants or donations.

Most of the research activity in the HES is financed from the general grant from the Ministry of Education, Research and Church Affairs: GUF. In 1997 GUF financed 69 per cent of total R&D costs in the HES, in 1981 GUF financed 79 per cent. The remaining part is financed from direct/external funding, i.e. business and industry, direct government funding, research council or other sources of funds.

In the national R&D statistics the direct, external government funding is composed of funds from the Research Council of Norway and Other public funding. Other external funding is provided into the categories: Business/industry, Other sources (i.e. own funds) and Abroad.

TABLE 2

R&D expenditures on total current costs and scientific equipment by main source of funding in the HES in 1997. (NOK million).

Main source of funding	Current costs	Scientific equipment	Total
GUF	2 825	97	2 922
Direct funding	1 399	106	1 505
Total	4 225	203	4 427

Source: NIFU

In this paper current expenditures are defined as labour costs and other current costs.

The *labour costs* comprise salaries and associated costs such as bonus payments, holiday pay, contribution to pension funds and other social security payments, payroll taxes etc.

*Other current costs* can be divided into 1) direct current costs at department level such as non-capital purchases of materials, supplies and minor equipment to support R&D (books, journals, reference materials, travel expenses) and 2) indirect current costs infrastructure/overhead costs such as water, fuel and services, central university administration costs, security, storage, computer service, rents etc.

Capital expenditures are the annual gross expenditures on fixed assets. They are composed of expenditures on

- land and buildings (not presented in this paper)
- scientific instruments and equipment (Table 2, 3 and 4)

From Table 2 we see that 67 per cent of the R&D expenditure on current costs and scientific equipment were funded from general university funds (GUF). Current costs financed by GUF represent 64 per cent of total R&D expenditure on current costs and scientific equipment. 52 per cent of scientific equipment was funded by external funds.

Table 3 to Table 8 is concentrated on the 64 units of biological and relevant biochemical units. The tables present data on R&D expenditure in these units.

TABLE 3

R&D expenditures on current costs and scientific equipment at university departments of biological and relevant biochemical disciplines by main source of funding in 1997 (NOK million).

Institution	GUF	Direct/ external funding	Total	Direct/ external funding, Percentage of total
<b>University of Oslo</b>	<b>95.0</b>	<b>87.9</b>	<b>182.9</b>	<b>48</b>
The Biotechnology Centre of Oslo	2.1	13.4	15.6	86
Department of Biology	14.5	8.6	23.1	37
Division of Botany and Plant Physiology	3.0	1.8	4.8	38
Division of General Genetics	1.9	2.3	4.2	54
Division of Marine Zoology and Marine Chemistry	2.1	1.6	3.6	43

Division of Marine Botany	1.9	3.4	5.3	64
Division of Limnology	1.4	0.7	2.2	33
Division of Molecular Cell Biology	3.6	4.1	7.7	54
Division of General Physiology	1.9	2.7	4.7	59
Division of Zoology	4.5	6.8	11.3	60
University Botanical Garden and Museum	7.6	0.5	8.1	6
Zoological Museum	5.9	4.5	10.5	43
Department of Biochemistry	6.4	3.4	9.8	35
School of Pharmacy – Section of Microbiology	0.9	0.1	1.0	7
Institute of Basic Medical Sciences	1.3	0.0	1.3	0
Department of Anatomy	7.5	6.8	14.3	48
Department of Physiology	2.0	4.5	6.5	69
Department of Medical Biochemistry	7.7	10.1	17.8	57
Department of Neurophysiology	3.7	3.8	7.5	50
Neurochemical Laboratory	1.6	0.5	2.1	25
Institute for Experimental Medical Research	4.9	5.6	10.6	53
Department of Oral Biology	8.5	2.7	11.2	24
<b>University of Bergen</b>	<b>89.0</b>	<b>89.3</b>	<b>178.3</b>	<b>50</b>
Department of Molecular Biology	5.8	15.0	20.8	72
Department of Botany	5.2	4.4	9.6	46
Department of Fisheries and Marine Biology	13.7	17.9	31.5	57
Department of Microbiology	5.9	5.9	11.8	50
Department of Zoology	7.4	6.8	14.2	48
The Gade Institute – Department of Microbiology and Immunology	9.7	4.6	14.3	32
Department of Physiology	9.2	10.5	19.7	53
Department of Anatomy and Cell Biology	9.6	5.9	15.5	38
Department of Biochemistry and Molecular Biology	10.0	3.9	13.9	28
Department of Clinical Biochemistry	4.8	2.7	7.6	36
Department of Paediatrics (incl. med. Genetics and clinical molecular medicine)	5.3	2.1	7.4	28
Centre for studies of Environment and Resources	2.3	9.6	11.9	81
<b>NTNU</b>	<b>51.2</b>	<b>54.6</b>	<b>105.8</b>	<b>52</b>
Department of Botany	9.3	6.0	15.3	39
Department of Zoology	8.9	5.6	14.5	39
Department of Biotechnology	8.7	13.4	22.1	60
Department of Physiology and Biomedical Engineering, Group of Physiology	5.3	4.3	9.6	45
Department of Cancer Research and Molecular Biology	5.4	5.8	11.2	52
Department of Morphology	3.3	0.3	3.6	8
UNIGEN - Centre for Molecular Biology	1.0	7.8	8.7	89
Museum of Natural History and Archaeology, Dept. of Natural History	1.5	0.0	1.5	0
Botanical Section	2.5	1.9	4.4	43
Trondhjem Biological Station	2.4	5.6	8.0	70
Zoology Section	3.0	3.8	6.8	56
<b>University of Tromsø</b>	<b>43.0</b>	<b>16.7</b>	<b>59.7</b>	<b>28</b>
Department of Biology	11.0	4.6	15.6	30
Tromsø Museum, Botanical Department	2.3	0.3	2.6	11
Tromsø Museum, Zoology Department	2.0	0.0	2.0	0
Institute of Medical Biology	10.2	0.0	10.2	0
Department of Arctic Biology/Zoophysiology	3.0	2.6	5.6	46
Department of Biochemistry	3.5	2.3	5.8	40
Department of Biotechnology	1.8	1.2	3.0	40
Department of Gene Biology	0.5	0.0	0.5	0
Department of Immunology	1.1	0.6	1.8	36
Department of Medical Biochemistry	1.8	0.6	2.4	24

Department of Medical Physiology	1.8	1.2	3.0	39
Department of Medical Microbiology	1.2	0.5	1.8	30
Department of Molecular Cell biology	1.2	1.2	2.4	52
Department of Virology	1.3	1.5	2.8	54
Department of Molecular Genetics	0.3	0.0	0.3	0
<b>Norwegian College of Fisheries Science</b>	<b>22.8</b>	<b>15.4</b>	<b>38.2</b>	<b>40</b>
Department of Marine Biochemistry	8.5	5.1	13.7	38
Department of Marine and Freshwater biology	6.7	6.6	13.3	50
Department of Aquatic Resources and Environmental Biology	7.6	3.6	11.2	32
<b>The University Courses on Svalbard, Biology</b>	<b>2.9</b>	<b>0.4</b>	<b>3.3</b>	<b>13</b>
<b>Total</b>	<b>303.8</b>	<b>264.3</b>	<b>568.1</b>	<b>47</b>

Source: NIFU

Table 2 shows that direct funding of total R&D expenditure on current costs and scientific equipment in the HES was 1.5 bil NOK, close to 34 per cent. Table 3 shows that the corresponding percentage for the selected biological and relevant biochemical units in 1997 was 47 per cent. In 1995 the percentage was 43. For natural sciences and medicine the percentage of direct funding of total R&D expenditure in 1997 was 41 per cent for medicine and 33 per cent for medicine.

The next table shows how the GUF is divided between current costs and scientific equipment.

Table 4

R&D expenditure financed by GUF for current costs and scientific equipment at university departments of biological and relevant biochemical disciplines in 1997. (NOK million).

Institution	Current Costs	Of which direct costs	Scientific equipment	Total
<b>University of Oslo</b>	<b>92.3</b>	<b>8.9</b>	<b>2.6</b>	<b>95.0</b>
The Biotechnology Centre of Oslo	2.1	0.3	0.1	2.1
Department of Biology	13.5	3.2	1.0	14.5
Division of Botany and Plant Physiology	3.0	..	0.0	3.0
Division of General Genetics	1.9	..	0.0	1.9
Division of Marine Zoology and Marine Chemistry	2.1	..	0.0	2.1
Division of Marine Botany	1.9	..	0.0	1.9
Division of Limnology	1.4	..	0.0	1.4
Division of Molecular Cell Biology	3.6	..	0.0	3.6
Division of General Physiology	1.9	..	0.0	1.9
Division of Zoology	4.5	..	0.0	4.5
University Botanical Garden and Museum	7.0	0.3	0.6	7.6
Zoological Museum	5.9	0.7	0.1	5.9
Department of Biochemistry	6.1	1.6	0.3	6.4
School of Pharmacy – Section of Microbiology	0.9	..	0.0	0.9
Institute of Basic Medical Sciences	1.3	..	0.0	1.3
Department of Anatomy	7.3	0.6	0.2	7.5
Department of Physiology	1.8	0.4	0.2	2.0
Department of Medical Biochemistry	7.7	0.9	0.0	7.7
Department of Neurophysiology	3.7	..	0.0	3.7
Neurochemical Laboratory	1.5	0.3	0.1	1.6



Institute for Experimental Medical Research	4.8	0.1	0.1	4.9
Department of Oral Biology	8.5	0.6	0.0	8.5
<b>University of Bergen</b>	<b>87.7</b>	<b>13.0</b>	<b>1.3</b>	<b>89.0</b>
Department of Molecular Biology	5.8	2.9	0.0	5.8
Department of Botany	5.2	0.3	0.0	5.2
Department of Fisheries and Marine Biology	13.3	1.3	0.4	13.7
Department of Microbiology	5.9	0.8	0.0	5.9
Department of Zoology	7.4	0.6	0.0	7.4
The Gade Institute – Department of Microbiology and Immunology	9.6	0.6	0.1	9.7
Department of Physiology	9.2	1.2	0.0	9.2
Department of Anatomy and Cell Biology	9.0	2.2	0.6	9.6
Department of Biochemistry and Molecular Biology	9.8	2.2	0.2	10.0
Department of Clinical Biochemistry	4.8	0.4	0.0	4.8
Department of Paediatrics (incl. med. Genetics and clinical molecular medicine)	5.3	0.4	0.0	5.3
Centre for studies of Environment and Resources	2.3	0.1	0.0	2.3
<b>NTNU</b>	<b>49.6</b>	<b>2.8</b>	<b>1.6</b>	<b>51.2</b>
Department of Botany	8.9	0.5	0.3	9.3
Department of Zoology	8.7	0.6	0.2	8.9
Department of Biotechnology	8.6	0.1	0.1	8.7
Department of Physiology and Biomedical Engineering, Group of Physiology	5.1	0.2	0.2	5.3
Department of Cancer Research and Molecular Biology	5.0	..	0.3	5.4
Department of Morphology	3.0	0.1	0.3	3.3
UNIGEN - Centre for Molecular Biology	1.0	0.2	0.0	1.0
Museum of Natural History and Archaeology, Dept. of Natural History	1.3	1.0	0.2	1.5
Botanical Section	2.5	..	0.0	2.5
Trondhjem Biological Station	2.4	..	0.0	2.4
Zoology Section	3.0	..	0.0	3.0
<b>University of Tromsø</b>	<b>42.0</b>	<b>3.7</b>	<b>1.0</b>	<b>43.0</b>
Department of Biology	10.0	1.4	1.0	11.0
Tromsø Museum, Botanical Department	2.3	..	0.0	2.3
Tromsø Museum, Zoology Department	2.0	..	0.0	2.0
Institute of Medical Biology	10.2	..	0.0	10.2
Department of Arctic Biology/Zoophysiology	3.0	1.0	0.0	3.0
Department of Biochemistry	3.5	..	0.0	3.5
Department of Biotechnology	1.8	0.3	0.0	1.8
Department of Gene Biology	0.5	..	0.0	0.5
Department of Immunology	1.1	0.2	0.0	1.1
Department of Medical Biochemistry	1.8	0.2	0.0	1.8
Department of Medical Physiology	1.8	0.3	0.0	1.8
Department of Medical Microbiology	1.2	0.1	0.0	1.2
Department of Molecular Cell biology	1.2	..	0.0	1.2
Department of Virology	1.3	0.2	0.0	1.3
Department of Molecular Genetics	0.3	..	0.0	0.3
<b>Norwegian College of Fisheries Science</b>	<b>22.3</b>	<b>1.8</b>	<b>0.4</b>	<b>22.8</b>
Department of Marine Biochemistry	8.3	0.8	0.2	8.5
Department of Marine and Freshwater biology	6.5	0.3	0.1	6.7
Department of Aquatic Resources and Environmental Biology	7.5	0.7	0.1	7.6
<b>The University Courses on Svalbard, Biology</b>	<b>2.6</b>	<b>..</b>	<b>0.3</b>	<b>2.9</b>
<b>Total</b>	<b>296.6</b>		<b>7.2</b>	<b>303.8</b>

Source: NIFU

Table 4 shows that all the selected units have very low expenditure on scientific equipment financed by GUF. Current costs represent almost 98 per cent of the GUF.

In table 4 current costs are divided between total current costs and direct current costs. Direct current costs comprise books, journals, and reference materials. The rest of the current costs are overhead or indirect costs, see also page 7.

The next table, Table 5, shows how direct funding is distributed on the different sources of funds.

TABLE 5  
Direct/external funding on R&D at university departments of biological and relevant biochemical disciplines by source of funds in 1997. (NOK million).

Institution	Source of funds				Total
	Direct government/ external funding			Other resources/ abroad/ own funds	
	Business/ Industry	Research Council of Norway	Other public Funding		
<b>University of Oslo</b>	<b>4.6</b>	<b>45.7</b>	<b>6.1</b>	<b>28.7</b>	<b>85.1</b>
The Biotechnology Centre of Oslo	2.0	7.4	0.0	4.0	13.4
Department of Biology	0.7	4.7	2.4	0.7	8.6
Division of Botany and Plant Physiology	0.0	1.8	0.0	0.0	1.8
Division of General Genetics	0.0	1.8	0.4	0.0	2.3
Division of Marine Zoology and Marine Chemistry	0.1	1.0	0.2	0.4	1.6
Division of Marine Botany	0.0	2.9	0.0	0.5	3.4
Division of Limnology	0.0	0.7	0.0	0.0	0.7
Division of Molecular Cell Biology	0.2	1.8	0.0	2.2	4.1
Division of General Physiology	0.1	2.1	0.4	0.2	2.7
Division of Zoology	0.1	5.1	0.5	1.1	6.8
University Botanical Garden and Museum	0.0	0.2	0.2	0.1	0.5
Zoological Museum	0.4	1.6	1.8	0.7	4.5
Department of Biochemistry	0.1	1.0	0.1	2.3	3.4
School of Pharmacy – Section of Microbiology	0.0	0.0	0.1	0.0	0.1
Institute of Basic Medical Sciences	0.0	0.0	0.0	0.0	0.0
Department of Anatomy	0.0	4.0	0.0	2.8	6.8
Department of Physiology	0.0	3.0	0.1	1.3	4.5
Department of Medical Biochemistry	0.7	2.0	0.0	7.5	10.1
Department of Neurophysiology	0.0	2.4	0.0	1.4	3.8
Neurochemical Laboratory	0.0	0.3	0.0	0.2	0.5
Institute for Experimental Medical Research	0.0	0.0	0.0	0.0	0.0
Department of Oral Biology	0.3	1.9	0.0	3.4	5.6
<b>University of Bergen</b>	<b>6.0</b>	<b>46.7</b>	<b>10.6</b>	<b>25.9</b>	<b>89.2</b>
Department of Molecular Biology	0.7	7.3	3.1	3.8	15.0
Department of Botany	0.0	3.7	0.4	0.3	4.4
Department of Fisheries and Marine Biology	0.6	15.0	1.1	1.1	17.9
Department of Microbiology	1.8	2.6	0.3	1.2	5.9
Department of Zoology	1.0	2.1	3.1	0.6	6.8

The Gade Institute – Department of Microbiology and Immunology	0.2	2.2	0.0	2.2	4.6
Department of Physiology	1.2	5.1	0.0	4.2	10.5
Department of Anatomy and Cell Biology	0.0	1.9	0.0	4.0	5.9
Department of Biochemistry and Molecular Biology	0.0	1.3	0.0	2.6	3.9
Department of Clinical Biochemistry	0.1	1.4	0.4	0.9	2.7
Department of Paediatrics (incl. med. Genetics and clinical molecular medicine)	0.0	0.3	0.0	1.8	2.1
Centre for studies of Environment and Resources	0.4	3.8	2.2	3.2	9.6
<b>NTNU</b>	<b>13.3</b>	<b>21.1</b>	<b>5.9</b>	<b>14.3</b>	<b>54.5</b>
Department of Botany	1.7	3.7	0.3	0.3	6.0
Department of Zoology	0.0	3.7	0.0	1.9	5.6
Department of Biotechnology	8.4	4.2	0.0	0.8	13.4
Department of Physiology and Biomedical Engineering, Group of Physiology	0.6	1.7	0.3	1.8	4.3
Department of Cancer Research and Molecular Biology	0.3	2.0	0.4	3.2	5.8
Department of Morphology	0.0	0.3	0.0	0.0	0.3
UNIGEN - Centre for Molecular Biology	1.7	2.2	0.2	3.7	7.8
Museum of Natural History and Archaeology	0.0	0.0	0.0	0.0	0.0
Botanical Section	0.0	0.6	1.3	0.0	1.9
Trondhjem Biological Station	0.2	2.8	0.1	2.5	5.6
Zoology Section	0.4	0.1	3.3	0.0	3.8
<b>University of Tromsø</b>	<b>2.0</b>	<b>8.2</b>	<b>1.7</b>	<b>4.7</b>	<b>16.6</b>
Department of Biology	1.1	2.2	0.6	0.8	4.6
Tromsø Museum, Botanical Department	0.3	0.0	0.0	0.0	0.3
Tromsø Museum, Zoology Department	0.0	0.0	0.0	0.0	0.0
Institute of Medical Biology	0.0	0.0	0.0	0.0	0.0
Department of Arctic Biology/Zoophysiology	0.0	1.3	1.1	0.1	2.6
Department of Biochemistry	0.0	0.9	0.0	1.4	2.3
Department of Biotechnology	0.4	0.8	0.0	0.1	1.2
Department of Gene Biology	0.0	0.0	0.0	0.0	0.0
Department of Immunology	0.0	0.1	0.0	0.5	0.6
Department of Medical Biochemistry	0.3	0.2	0.0	0.1	0.6
Department of Medical Physiology	0.0	0.3	0.0	0.9	1.2
Department of Medical Microbiology	0.0	0.5	0.0	0.0	0.5
Department of Molecular Cell biology	0.0	0.9	0.0	0.3	1.2
Department of Virology	0.0	0.9	0.0	0.6	1.5
Department of Molecular Genetics	0.0	0.0	0.0	0.0	0.0
<b>Norwegian College of Fishery Science</b>	<b>1.2</b>	<b>8.8</b>	<b>0.8</b>	<b>4.6</b>	<b>15.4</b>
Department of Marine Biochemistry	0.8	4.0	0.0	0.4	5.1
Department of Marine and Freshwater biology	0.0	1.9	0.5	4.2	6.6
Department of Aquatic Resources and Environmental Biology	0.4	2.9	0.3	0.0	3.6
<b>The University Courses on Svalbard, Biology</b>	<b>0.1</b>	<b>0.1</b>	<b>0.0</b>	<b>0.1</b>	<b>0.4</b>
<b>Total</b>	<b>27.1</b>	<b>130.6</b>	<b>25.2</b>	<b>78.3</b>	<b>261.2</b>

Source: NIFU

The largest source of funds in 1997 is the Research Council of Norway. The share is 50 per cent of direct funding on R&D. Other resources/abroad/own funds follow with 30 per cent share. Funds from the European Commission amount to 18.9 NOK million or a 24 per cent share of the category Other resources/abroad/own fund. Business/industry and Other public

funding both contribute with approximately 10 per cent of direct external funding.

Table 6 shows the distribution of direct funding for the units in this paper, for natural sciences, medicine and the total HES in 1997:

TABLE 6

Direct/external funding on R&D at university departments of biological and relevant biochemical disciplines, medicine and natural sciences by source of funds in 1997. Per cent.

	Business/ industry	Research Council of Norway	Other public funding	Other resources/ abroad/ own funds	Total
<b>64 biology-related units</b>	<b>10</b>	<b>50</b>	<b>10</b>	<b>30</b>	<b>100</b>
Medicine	12	31	20	37	100
Natural Sciences	14	54	13	19	100
Total	17	45	19	19	100

Source: NIFU

From Table 6 we see that for medicine the Research Council of Norway is not as important as it is for the selected units or natural sciences, but Other resources/abroad/own funds contribute with a high share of the R&D expenditure. We also notice that Business/industry contribute with a less share to the selected units (10 per cent) than to medicine (12 per cent) or natural sciences (14 per cent). Compared with all units in the HES the selected units had an especially high share of Other resources/abroad/own funds.

Table 7 shows distribution of current costs by type of activity at the biological and relevant biochemical units:

TABLE 7

Current expenditures by type of activity at university departments of biological and relevant biochemical disciplines in 1997. Per cent, rounded off to closest 5.

Institution	Type of activity			Total
	Basic Research	Applied Research	Experi- mental develop- ment	
<b>University of Oslo</b>				
The Biotechnology Centre of Oslo	60	40	0	100
Department of Biology	70	30	0	100
Division of Botany and Plant Physiology	90	5	5	100
Division of General Genetics	70	20	10	100
Division of Marine Zoology and Marine Chemistry	70	30	0	100
Division of Marine Botany	90	10	0	100
Division of Limnology	80	20	0	100
Division of Molecular Cell Biology	65	35	0	100
Division of General Physiology	100	0	0	100
Division of Zoology	90	10	0	100
University Botanical Garden and Museum	95	5	0	100

Zoological Museum	70	20	10	100
Department of Biochemistry	85	10	5	100
School of Pharmacy – Section of Microbiology	50	40	10	100
Institute of Basic Medical Sciences	25	50	25	100
Department of Anatomy	100	0	0	100
Department of Physiology	95	5	0	100
Department of Medical Biochemistry	70	17	11	98
Department of Neurophysiology	100	0	0	100
Neurochemical Laboratory	100	0	0	100
Institute for Experimental Medical Research	70	20	10	100
Department of Oral Biology	90	5	5	100
<b>University of Bergen</b>				
Department of Molecular Biology	90	10	0	100
Department of Botany	70	30	0	100
Department of Fisheries and Marine Biology	60	40	0	100
Department of Microbiology	90	10	0	100
Department of Zoology	80	17	3	100
The Gade Institute – Department of Microbiology and Immunology	40	45	15	100
Department of Physiology	95	5	0	100
Department of Anatomy and Cell Biology	85	10	5	100
Department of Biochemistry and Molecular Biology	80	20	0	100
Department of Clinical Biochemistry	80	15	5	100
Department of Paediatrics (incl. med. Genetics and clinical molecular medicine)	25	75	0	100
Centre for studies of Environment and Resources	80	10	10	100
<b>NTNU</b>				
Department of Botany	75	20	5	100
Department of Zoology	75	25	0	100
Department of Biotechnology	50	50	0	100
Department of Physiology and Biomedical Engineering, Group of Physiology	50	25	25	100
Department of Cancer Research and Molecular Biology	80	10	10	100
Department of Morphology	90	10	0	100
UNIGEN – Centre for Molecular Biology	80	20	0	100
Museum of Natural History and Archaeology	50	40	10	100
Botanical Section	50	40	10	100
Trondhjem Biological Station	50	40	10	100
Zoology Section	50	40	10	100
<b>University of Tromsø</b>				
Department of Biology	70	30	0	100
Tromsø Museum, Botanical Department	50	30	20	100
Tromsø Museum, Zoology Department	90	10	0	100
Institute of Medical Biology	50	40	10	100
Department of Arctic Biology/Zoophysiology	80	10	10	100
Department of Biochemistry	90	10	0	100
Department of Biotechnology	20	60	20	100
Department of Gene Biology	50	40	10	100
Department of Immunology	75	25	0	100
Department of Medical Biochemistry	90	5	5	100
Department of Medical Physiology	100	0	0	100
Department of Medical Microbiology	50	50	0	100
Department of Molecular Cell biology	75	25	0	100
Department of Virology	75	25	0	100
Department of Molecular Genetics	50	40	10	100



<b>Norwegian College of Fishery Science</b>				
Department of Marine Biochemistry	80	20	0	100
Department of Marine and Freshwater biology	60	40	0	100
Department of Aquatic Resources and Environmental Biology	80	20	0	100
<b>The University Courses on Svalbard, Biology</b>	80	10	10	100

Source: NIFU

In the Frascati Manual<sup>3</sup> the three types of activities are defined as follow:

- Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view.
- Applied research is also original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or object.
- Experimental development is systematic work, drawing on existing knowledge gained from research and practical experience, that is directed to producing new materials, products and devices; to installing new processes, systems or services; or to improving substantially those already produced or installed.

Table 8 shows the distribution of R&D expenditure by type of activity for the Higher Education Sector (HES) as a whole and for medicine and natural sciences.

Table 8  
Current expenditures by type of activity for medicine,  
natural sciences and total HES in 1997. Per cent.

Field of Subject	Type of activity			Total
	Basic Research	Applied Research	Experimental development	
Medicine	40	42	18	100
Natural sciences	69	24	7	100
Total HES	47	37	16	100

Source: NIFU

<sup>3</sup> The international guidelines for compiling R&D statistics are issued by OECD in the "Frascati Manual" (*The measurement of Scientific and Technological Activities. Proposed Standard Practice for Surveys of Research and Development*. Frascati Manual 1993, OECD 1994).

## R&D personnel

Table 9 and Table 10 present figures on academic staff at the departments of biological and relevant biochemical disciplines.

Table 9 shows the number of scientific personnel at the selected departments and within natural sciences and medicine in 1995 and 1997.

TABLE 9

Academic staff at university departments of biological and relevant biochemical Disciplines and to total academic staff at the universities in 1995 and 1997.

Category	1995	1997	Change in
			Per cent
Total academic staff	8755	9597	9.6
Of which in natural sciences <sup>1</sup>	2070	2038	-1.5
Of which in medicine	2338	2615	11.8
The 64 selected units in this paper	1003	1088	8.5

Source: NIFU

<sup>1</sup> The decline of academic staff within the natural sciences is due to a reclassification of 3 units (Departments of Medical. Techn, Medical chemistry and Pharmacy) from natural sciences to other fields of subjects (two into technology and one into medicine).

Table 9 shows that 1088 persons had scientific positions at the departments of biological disciplines in 1997. This is approximately 11 per cent of total academic staff, the same share as in 1995.

Table 10 shows the professional rank of the academic staff at the selected departments.

TABLE 10

Academic staff at university departments of biological and relevant biochemical disciplines by institution and professional rank in 1997.

Institution	Professor	Associate Professor	Other tenured positions	Total tenured personnel	Recruitment personnel	Externally paid researchers	Total
<b>University of Oslo</b>	<b>102</b>	<b>30</b>	<b>13</b>	<b>145</b>	<b>161</b>	<b>69</b>	<b>375</b>
The Biotechnology Centre of Oslo	1	0	3	4	18	6	28
Department of Biology	1	3	0	4	9	6	19
Division of Botany and Plant Physiology	8	1	0	9	5	1	15
Division of General Genetics	2	1	1	4	8	1	13
Division of Marine Zoology and Marine Chemistry	3	2	1	6	4	2	12
Division of Marine Botany	3	1	0	4	2	4	10
Division of Limnology	4	1	0	5	2	0	7
Division of Molecular Cell Biology	8	1	0	9	10	3	22
Division of General Physiology	4	3	0	7	1	4	12
Division of Zoology	6	2	0	8	12	14	34
University Botanical Garden and Museum	5	2	3	10	4	0	14

Zoological Museum	5	3	0	8	3	6	17
Department of Biochemistry	10	0	0	10	12	3	25
School of Pharmacy - Section of Microbiology	1	3	0	4	0	0	4
Institute of Basic Medical Sciences	0	1	0	1	0	0	1
Department of Anatomy	10	0	0	10	21	4	35
Department of Physiology	7	0	0	7	9	2	18
Department of Medical Biochemistry	8	0	0	8	23	6	37
Department of Neurophysiology	4	0	0	4	7	5	16
Neurochemical Laboratory	1	1	1	3	1	0	4
Institute for Experimental Medical Research	2	0	2	4	6	2	12
Department of Oral Biology	9	5	2	16	4	0	20
<b>University of Bergen</b>	<b>67</b>	<b>52</b>	<b>28</b>	<b>147</b>	<b>129</b>	<b>59</b>	<b>335</b>
Department of Molecular Biology	7	4	1	12	19	6	37
Department of Botany	5	4	3	12	10	5	27
Department of Fisheries and Marine Biology	7	10	3	20	29	13	62
Department of Microbiology	5	3	2	10	10	7	27
Department of Zoology	6	6	1	13	7	8	28
The Gade Institute - Department of Microbiology and Immunology	6	3	2	11	7	4	22
Department of Physiology	9	5	0	14	12	4	30
Department of Anatomy and Cell Biology	6	6	1	13	9	2	24
Department of Biochemistry and Molecular Biology	6	6	2	14	11	2	27
Department of Clinical Biochemistry	4	2	5	11	6	0	17
Department of Paediatrics (incl. med. genetics and clinical molecular medicine)	5	1	8	14	4	1	19
Centre for studies of Environment and Resources	1	2	0	3	5	7	15
<b>NTNU</b>	<b>40</b>	<b>22</b>	<b>13</b>	<b>75</b>	<b>87</b>	<b>43</b>	<b>205</b>
Department of Botany	5	5	4	14	14	7	35
Department of Zoology	8	9	1	18	11	5	34
Department of Biotechnology	9	1	1	11	15	7	33
Department of Physiology and Biomedical Engineering, Group of Physiology	5	1	0	6	11	2	19
Department of Cancer Research and Molecular Biology	3	0	1	4	15	6	25
Department of Morphology	2	3	2	7	1	0	8
UNIGEN - Centre for Molecular Biology	0	0	0	0	8	10	18
Museum of Natural History and Archaeology, Dept. of Natural History	0	0	0	0	0	0	0
Botanical Section	2	1	3	6	5	0	11
Trondhjem Biological Station	3	1	0	4	4	3	11
Zoology Section	3	1	1	5	3	3	11
<b>University of Tromsø</b>	<b>23</b>	<b>32</b>	<b>2</b>	<b>57</b>	<b>48</b>	<b>6</b>	<b>111</b>
Department of Biology	4	12	1	17	10	2	29
Tromsø Museum, Botanical Department	0	4	0	4	2	0	6
Tromsø Museum, Zoology Department	1	3	0	4	0	0	4
Institute of Medical Biology	1	0	0	0	0	0	1
Department of Arctic Biology/Zoophysiology	2	2	0	4	3	1	8
Department of Biochemistry	4	2	0	6	9	0	15
Department of Biotechnology	1	2	0	3	4	0	7
Department of Gene Biology	0	1	0	1	1	0	2
Department of Immunology	1	1	1	3	3	0	6
Department of Medical Biochemistry	1	1	0	2	4	1	7
Department of Medical Physiology	4	0	0	4	1	0	5
Department of Medical Microbiology	1	3	0	4	1	0	5
Department of Molecular Cell biology	1	1	0	2	5	1	8
Department of Virology	1	0	0	1	5	1	7
Department of Molecular Genetics	1	0	0	1	0	0	1

<b>Norwegian College of Fisheries Science</b>	<b>12</b>	<b>15</b>	<b>2</b>	<b>29</b>	<b>22</b>	<b>7</b>	<b>58</b>
Department of Marine Biochemistry	3	5	1	9	11	4	24
Department of Marine and Freshwater biology	4	5	0	9	5	2	16
Department of Aquatic Resources and Environmental Biology	5	5	1	11	6	1	18
<b>The University Courses on Svalbard, Biology</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>4</b>
<b>Total 1997</b>	<b>244</b>	<b>154</b>	<b>58</b>	<b>456</b>	<b>447</b>	<b>185</b>	<b>1088</b>
<b>Total 1995</b>	<b>220</b>	<b>153</b>	<b>44</b>	<b>409</b>	<b>430</b>	<b>164</b>	<b>1003</b>

*Source: NIFU*

The total tenured personnel share of total academic staff for the selected units was close to 42 per cent in 1997. The recruitment personnel (fellowship holders) amounts to 41 per cent of the total personnel, the rest is externally paid researchers (contract researchers).

The University of Oslo covers 34 per cent of the total personnel in the units included in this paper, the University of Bergen covers 31 per cent.

In addition to the staff in Table 10, there were 70 part time professors at the selected units of biological and relevant biochemical units in 1997.

## Appendix

### Expenditure on Research and Experimental Development (R&D) Academic staff

#### Data from Norwegian R&D Statistics 1995

Table 1	R&D expenditure on current costs and scientific equipment by main source of funding in the HES in 1995.....	20
Table 2	R&D financed by GUF for current costs and scientific equipment at university departments of biological and relevant biochemical disciplines in 1995. (NOK million).....	22
Table 3	Direct/external funding on R&D at university departments of biological and relevant Biochemical disciplines by source of funds in 1995. (NOK million).....	24
Table 4	Direct/external funding on R&D at university departments of biological and relevant biochemical disciplines, medicine and natural sciences by source of funds in 1995. Per cent.....	26
Table 5	Current expenditures by type of activity in medicine, natural sciences and total HES in 1995. Per cent.....	27
Table 6	Current expenditures by type of activity at university departments of biological and relevant biochemical disciplines in 1995. Per cent rounded off to closest 5.....	28
Table 7	Academic staff at university departments of biological and relevant biochemical disciplines by institution and professional rank 1995.....	30



Table 1

Table 1  
Direct/external funding on R&D at university departments of biological and relevant biochemical  
biological and relevant biochemical disciplines by main source of funding in 1995 (NOK million).

Institution	GUF	Direct/ external funding	Total	Direct/ext. funding, percentage of total expenditures
<b>University of Oslo</b>	<b>96.0</b>	<b>69.1</b>	<b>165.1</b>	<b>42</b>
The Biotechnology Centre of Oslo	2.5	10.2	12.7	81
Department of Biology	9.2	0.0	9.2	0
Division of Botany and Plant Physiology	3.4	1.6	5.0	32
Division of General Genetics	2.0	3.7	5.7	65
Division of Marine Zoology and Marine Chemistry	2.5	2.1	4.7	46
Division of Marine Botany	1.8	2.2	4.0	54
Division of Limnology	1.9	0.3	2.2	13
Division of Molecular Cell Biology	5.1	4.4	9.5	46
Division of General Physiology	2.5	2.2	4.7	47
Division of Zoology	4.5	4.2	8.7	48
University Botanical Garden and Museum	7.2	0.6	7.8	7
Zoological Museum	6.4	6.5	12.9	51
Department of Biochemistry	5.9	1.9	7.8	24
School of Pharmacy - Section of Microbiology	1.2	0.0	1.2	0
Institute of Basic Medical Sciences	3.8	1.9	5.7	34
Department of Anatomy	7.0	4.5	11.5	39
Department of Physiology	5.0	3.8	8.8	43
Department of Medical Biochemistry	6.2	7.6	13.8	55
Department of Neurophysiology	3.3	4.6	7.8	58
Neurochemical Laboratory	0.5	0.3	0.8	39
Institute for Experimental Medical Research	4.0	6.3	10.2	61
Department of Oral Biology	10.1	0.5	10.6	4
<b>University of Bergen</b>	<b>79.1</b>	<b>71.2</b>	<b>150.3</b>	<b>47</b>
Department of Molecular Biology	5.1	3.8	8.9	42
Department of Botany	6.3	3.4	9.7	35
Department of Fisheries and Marine Biology	13.4	17.5	30.9	57
Department of Microbiology	5.6	7.3	12.9	57
Department of Zoology	10.8	7.9	18.7	42
The Gade Institute - Department of Microbiology and Immunology	3.7	4.6	8.3	55
Department of Physiology	7.8	5.4	13.2	41
Department of Anatomy and Cell Biology	8.4	5.3	13.7	39
Department of Biochemistry and Molecular Biology	9.2	7.9	17.1	46
Department of Clinical Biochemistry	2.3	0.9	3.2	27
Department of Paediatrics (incl. med. genetics and clinical molecular r	4.3	1.8	6.1	30
Centre for studies of Environment and Resources	2.2	5.6	7.8	72
<b>NTNU</b>	<b>51.2</b>	<b>48.5</b>	<b>99.7</b>	<b>49</b>
Department of Botany	8.8	2.5	11.3	22
Department of Zoology	10.7	3.7	14.4	26
Department of Biotechnology	9.0	15.7	24.6	64
Department of Physiology and Biomedical Engineering, Group of Phy	3.1	2.8	5.9	47
Department of Cancer Research and Molecular Biology	2.9	2.6	5.5	48
Department of Morphology	3.9	0.2	4.1	4
UNIGEN - Centre for Molecular Biology	0.9	11.4	12.3	93
Museum of Natural History and Arceology, Dept. of Natural History	0.1	0.0	0.1	0
Botanical Section	3.0	1.4	4.4	31
Trondhjem Biological Station	4.7	4.2	8.9	47
Zoology Section	4.2	4.1	8.3	50

Table 1

<b>University of Tromsø</b>	<b>33.7</b>	<b>17.0</b>	<b>50.7</b>	<b>34</b>
Department of Biology	7.6	4.5	12.1	37
Tromsø Museum, Botanical Department	2.6	0.7	3.3	21
Tromsø Museum, Zoology Department	2.2	0.5	2.7	19
Institute of Medical Biology	0.0	0.0	0.0	
Department of Arctic Biology/Zoophysiology	6.3	3.0	9.3	32
Department of Biochemistry	3.9	3.5	7.3	47
Department of Biotechnology	0.3	0.2	0.4	37
Department of Gene Biology	..	..	..	
Department of Immunology	1.2	0.5	1.8	31
Department of Medical Biochemistry	1.6	0.3	1.9	17
Department of Medical Physiology	2.3	1.2	3.5	33
Department of Medical Microbiology	3.4	0.0	3.4	0
Department of Molecular Cell biology	1.3	0.8	2.1	38
Department of Virology	1.0	1.8	2.8	65
Department of Molecular Genetics	0.0	0.0	0.0	77
<b>Norwegian College of Fisheries Science</b>	<b>22.3</b>	<b>14.9</b>	<b>37.3</b>	<b>40</b>
Department of Marine Biochemistry	8.7	5.7	14.4	40
Department of Marine and Freshwater biology	7.1	5.5	12.6	44
Department of Aquatic Resources and Environmental Biology	6.6	3.7	10.3	36
<b>The University Courses on Svalbard, Biology</b>	<b>1.7</b>	<b>0.1</b>	<b>1.8</b>	<b>5</b>
<b>Total</b>	<b>284.0</b>	<b>220.8</b>	<b>504.8</b>	<b>44</b>

Source: NIFU

Table 2

Table 2  
Direct/external funding on R&D at university departments of biological and relevant biochemical  
of biological and relevant biochemical disciplines in 1995. (NOK million).

Institution	Current costs	Scientific equipment	Total
<b>University of Oslo</b>	<b>92.0</b>	<b>4.0</b>	<b>96.0</b>
The Biotechnology Centre of Oslo	2.3	0.2	2.5
Department of Biology	9.2	0.0	9.2
Division of Botany and Plant Physiology	3.3	0.1	3.4
Division of General Genetics	2.0	0.1	2.0
Division of Marine Zoology and Marine Chemistry	2.4	0.2	2.5
Division of Marine Botany	1.7	0.1	1.8
Division of Limnology	1.9	0.1	1.9
Division of Molecular Cell Biology	5.0	0.1	5.1
Division of General Physiology	2.4	0.1	2.5
Division of Zoology	4.4	0.1	4.5
University Botanical Garden and Museum	6.5	0.6	7.1
Zoological Museum	6.3	0.1	6.4
Department of Biochemistry	5.5	0.4	5.9
School of Pharmacy - Section of Microbiology	1.2	0.0	1.2
Institute of Basic Medical Sciences	3.8	0.0	3.8
Department of Anatomy	6.8	0.2	7.0
Department of Physiology	4.7	0.2	5.0
Department of Medical Biochemistry	5.9	0.3	6.2
Department of Neurophysiology	3.2	0.0	3.3
Neurochemical Laboratory	0.4	0.1	0.5
Institute for Experimental Medical Research	3.9	0.1	4.0
Department of Oral Biology	9.2	0.9	10.1
<b>University of Bergen</b>	<b>76.4</b>	<b>2.6</b>	<b>79.0</b>
Department of Molecular Biology	5.1	0.0	5.1
Department of Botany	5.9	0.3	6.3
Department of Fisheries and Marine Biology	13.0	0.4	13.4
Department of Microbiology	5.4	0.2	5.6
Department of Zoology	10.5	0.3	10.8
The Gade Institute - Department of Microbiology and Immunology	3.7	0.0	3.7
Department of Physiology	7.5	0.3	7.8
Department of Anatomy and Cell Biology	7.8	0.6	8.4
Department of Biochemistry and Molecular Biology	8.8	0.4	9.2
Department of Clinical Biochemistry	2.3	0.0	2.3
Department of Paediatrics (incl. med. genetics and clinical molecular medicine)	4.2	0.1	4.3
Centre for studies of Environment and Resources	2.2	0.0	2.2
<b>NTNU</b>	<b>48.0</b>	<b>3.2</b>	<b>51.2</b>
Department of Botany	8.5	0.3	8.8
Department of Zoology	10.2	0.4	10.7
Department of Biotechnology	8.7	0.3	9.0
Department of Physiology and Biomedical Engineering, Group of Physiology	2.2	1.0	3.1
Department of Cancer Research and Molecular Biology	2.7	0.2	2.9
Department of Morphology	3.2	0.7	3.9
UNIGEN - Centre for Molecular Biology	0.9	0.0	0.9
Museum of Natural History and Arceology, Dept. of Natural History	0.1	0.0	0.1
Botanical Section	2.9	0.0	3.0
Trondhjem Biological Station	4.4	0.3	4.7
Zoology Section	4.3	0.0	4.3

Table 2

<b>University of Tromsø</b>	<b>33.0</b>	<b>0.7</b>	<b>33.7</b>
Department of Biology	7.6	0.0	7.6
Tromsø Museum, Botanical Department	2.6	0.1	2.6
Tromsø Museum, Zoology Department	2.1	0.1	2.2
Institute of Medical Biology	0.0	0.0	0.0
Department of Arctic Biology/Zoophysiology	6.2	0.1	6.3
Department of Biochemistry	3.7	0.1	3.9
Department of Biotechnology	0.3	0.0	0.3
Department of Gene Biology	..	..	..
Department of Immunology	1.1	0.1	1.2
Department of Medical Biochemistry	1.5	0.1	1.6
Department of Medical Physiology	2.3	0.0	2.3
Department of Medical Microbiology	3.4	0.0	3.4
Department of Molecular Cell biology	1.2	0.1	1.3
Department of Virology	0.9	0.1	1.0
Department of Molecular Genetics	0.0	0.0	0.0
<b>Norwegian College of Fisheries Science</b>	<b>21.6</b>	<b>0.8</b>	<b>22.3</b>
Department of Marine Biochemistry	8.4	0.3	8.7
Department of Marine and Freshwater biology	6.9	0.2	7.1
Department of Aquatic Resources and Environmental Biology	6.3	0.3	6.6
<b>The University Courses on Svalbard, Biology</b>	<b>1.7</b>	<b>0.0</b>	<b>1.7</b>
<b>Total</b>	<b>272.6</b>	<b>11.4</b>	<b>283.9</b>

Source: NIFU

Table 3

Table 3  
Direct/external funding on R&D at university departments of biological and relevant biochemical relevant biochemical disciplines by source of funds in 1995. (NOK million).

Institution	Source of funds				Total
	Direct government/ external funding				
	Business/ industry	Research Council of Norway	Other public funding	Other resources/ abroad/	
<b>University of Oslo</b>	<b>5.4</b>	<b>34.8</b>	<b>8.0</b>	<b>20.8</b>	<b>69.0</b>
The Biotechnology Centre of Oslo	3.3	4.7	0.0	2.2	10.2
Department of Biology	0.0	0.0	0.0	0.0	0.0
Division of Botany and Plant Physiology	0.0	1.4	0.1	0.0	1.5
Division of General Genetics	0.5	2.9	0.3	0.0	3.7
Division of Marine Zoology and Marine Chemistry	0.4	1.3	0.5	0.0	2.1
Division of Marine Botany	0.0	1.7	0.2	0.3	2.2
Division of Limnology	0.0	0.2	0.1	0.0	0.3
Division of Molecular Cell Biology	0.4	2.2	0.1	1.7	4.4
Division of General Physiology	0.2	1.9	0.0	0.1	2.2
Division of Zoology	0.3	2.5	1.3	0.1	4.2
University Botanical Garden and Museum	0.0	0.2	0.3	0.1	0.6
Zoological Museum	0.2	1.8	4.6	0.0	6.5
Department of Biochemistry	0.0	0.6	0.0	1.2	1.9
School of Pharmacy - Section of Microbiology	0.0	0.0	0.0	0.0	0.0
Institute of Basic Medical Sciences	0.0	1.9	0.0	0.0	1.9
Department of Anatomy	0.0	2.3	0.0	2.2	4.5
Department of Physiology	0.0	1.5	0.3	2.0	3.8
Department of Medical Biochemistry	0.1	2.9	0.2	4.4	7.6
Department of Neurophysiology	0.0	4.0	0.0	0.6	4.5
Neurochemical Laboratory	0.0	0.2	0.0	0.1	0.3
Institute for Experimental Medical Research	0.0	0.7	0.0	5.6	6.3
Department of Oral Biology	0.0	0.1	0.2	0.2	0.4
<b>University of Bergen</b>	<b>6.2</b>	<b>41.8</b>	<b>9.0</b>	<b>14.2</b>	<b>71.1</b>
Department of Molecular Biology	0.0	3.1	0.3	0.3	3.8
Department of Botany	0.0	2.4	0.3	0.8	3.5
Department of Fisheries and Marine Biology	2.8	10.2	3.5	1.1	17.4
Department of Microbiology	2.1	3.0	0.0	2.2	7.3
Department of Zoology	0.0	3.1	4.5	0.3	7.9
The Gade Institute - Department of Microbiology and Immunology	0.0	3.1	0.0	1.5	4.6
Department of Physiology	0.0	4.5	0.0	0.9	5.4
Department of Anatomy and Cell Biology	0.0	2.5	0.0	2.8	5.3
Department of Biochemistry and Molecular Biology	1.2	4.2	0.0	2.5	7.9
Department of Clinical Biochemistry	0.0	0.0	0.0	0.8	0.9
Department of Paediatrics (incl. med. genetics and clinical molecular medicine)	0.1	0.9	0.0	0.8	1.8
Centre for studies of Environment and Resources	0.0	4.9	0.4	0.3	5.6
<b>NTNU</b>	<b>19.3</b>	<b>17.5</b>	<b>4.1</b>	<b>7.5</b>	<b>48.4</b>
Department of Botany	0.6	1.4	0.1	0.4	2.5
Department of Zoology	0.0	2.6	0.0	1.1	3.7
Department of Biotechnology	11.0	3.9	0.0	0.8	15.7
Department of Physiology and Biomedical Engineering, Group of Physiology	1.3	1.0	0.0	0.5	2.8
Department of Cancer Research and Molecular Biology	0.0	1.0	0.0	1.6	2.6
Department of Morphology	0.0	0.0	0.2	0.0	0.2
UNIGEN - Centre for Molecular Biology	4.1	3.6	0.7	3.0	11.4

Table 4

Table 4  
 Direct/external funding on R&D at university departments of biological and relevant biochemical disciplines, medicine and natural sciences by source of funds in 1995. Per cent.

	Business/ industry	Research Council of Norway	Other public funding	Other resources/ abroad/ own funds	Total
<b>64 biology-related units</b>	<b>15</b>	<b>51</b>	<b>12</b>	<b>22</b>	<b>100</b>
Medicine	14	34	16	37	100
Natural Science	19	58	11	13	100
<b>Total</b>	<b>18</b>	<b>47</b>	<b>19</b>	<b>16</b>	<b>100</b>

Source: NIFU

Table 5

Table 5  
Direct/external funding on R&D at university departments of biological and relevant biochemical natural sciences and total Higher Education Sector in 1995. Per cent.

Field of subject	Type of activity			Total	
	Basic research	Applied research	Experimental development		
Medicine		40	41	19	100
Natural sciences		67	24	9	100
<b>Total Higher Education Sector</b>		<b>48</b>	<b>37</b>	<b>15</b>	<b>100</b>

Source: NIFU

Table 6

Table 6  
Direct/external funding on R&D at university departments of biological and relevant biochemical biological and relevant biochemical disciplines in 1997. Per cent, rounded off to closest 5.

Institution	Type of activity			Total
	Basic research	Applied research	Experimental development	
<b>University of Oslo</b>				
The Biotechnology Centre of Oslo	60	40	0	100
Department of Biology	80	15	5	100
Division of Botany and Plant Physiology	90	5	5	100
Division of General Genetics	70	20	10	100
Division of Marine Zoology and Marine Chemistry	70	30	0	100
Division of Marine Botany	90	10	0	100
Division of Limonology	80	20	0	100
Division of Molecular Cell Biology	65	35	0	100
Division of General Physiology	100	0	0	100
Division of Zoology	90	10	0	100
University Botanical Garden and Museum	95	5	0	100
Zoological Museum	70	20	10	100
Department of Biochemistry	85	10	5	100
School of Pharmacy - Section of Microbiology	80	15	5	100
Institute of Basic Medical Sciences	35	45	20	100
Department of Anatomy	100	0	0	100
Department of Physiology	95	5	0	100
Department of Medical Biochemistry	90	10	0	100
Department of Neurophysiology	100	0	0	100
Neurochemical Laboratory	100	0	0	100
Institute for Experimental Medical Research	35	45	20	100
Department of Oral Biology	90	5	5	100
<b>University of Bergen</b>				
Department of Molecular Biology	20	65	15	100
Department of Botany	70	30	0	100
Department of Fisheries and Marine Biology	60	40	0	100
Department of Microbiology	90	10	0	100
Department of Zoology	75	25	0	100
The Gade Institute - Department of Microbiology and Immunology	75	15	10	100
Department of Physiology	95	5	0	100
Department of Anatomy and Cell Biology	90	0	10	100
Department of Biochemistry and Molecular Biology	80	10	10	100
Department of Clinical Biochemistry	60	15	25	100
Department of Paediatrics (incl. med. genetics and clinical molecular medicine)	25	75	0	100
Centre for studies of Environment and Resources	80	10	10	100
<b>NTNU</b>				
Department of Botany	75	20	5	100
Department of Zoology	80	20	0	100
Department of Biotechnology	50	40	10	100
Department of Physiology and Biomedical Engineering, Group of Physiology	50	25	25	100
Department of Cancer Research and Molecular Biology	70	25	5	100
Department of Morphology	90	10	0	100
UNIGEN - Centre for Molecular Biology	80	20	0	100
Museum of Natural History and Arceology, Dept. of Natural History	50	40	10	100
Botanical Section	50	40	10	100
Trondhjem Biological Station	85	10	5	100



Table 6

Zoology Section	20	60	20	100
<b>University of Tromsø</b>				
Department of Biology	80	20	0	100
Tromsø Museum, Botanical Department	50	30	20	100
Tromsø Museum, Zoology Department	90	10	0	100
Institute of Medical Biology	..	..	..	0
Department of Arctic Biology/Zoophysiology	60	30	10	100
Department of Biochemistry	90	10	0	100
Department of Biotechnology	50	25	25	100
Department of Gene Biology	..	..	..	
Department of Immunology	100	0	0	100
Department of Medical Biochemistry	80	10	10	100
Department of Medical Physiology	100	0	0	100
Department of Medical Microbiology	100	0	0	100
Department of Molecular Cell biology	75	25	0	100
Department of Virology	75	25	0	100
Department of Molecular Genetics	80	15	5	100
<b>Norwegian College of Fisheries Science</b>				
Department of Marine Biochemistry	75	25	0	100
Department of Marine and Freshwater biology	70	20	10	100
Department of Aquatic Resources and Environmental Biology	40	40	20	100
<b>The University Courses on Svalbard, Biology</b>	80	20	0	100

Source: NIFU

Table 7

Table 7  
Direct/external funding on R&D at university departments of biological and relevant biochemical  
biochemical disciplines by institution and professional rank in 1995.

Institution	Professor	Associate professor	Other tenured positions	Total tenured personnel	Recruitment personnel	Externally paid researchers	Total
<b>University of Oslo</b>	<b>87</b>	<b>35</b>	<b>11</b>	<b>125</b>	<b>141</b>	<b>56</b>	<b>322</b>
The Biotechnology Centre of Oslo	0	0	0	0	14	6	20
Department of Biology	0	1	0	1	4	0	5
Division of Botany and Plant Physiology	8	1	0	9	4	3	16
Division of General Genetics	2	1	0	3	6	2	11
Division of Marine Zoology and Marine C	3	2	1	6	4	1	11
Division of Marine Botany	3	1	0	4	2	2	8
Division of Limnology	4	1	0	5	2	0	7
Division of Molecular Cell Biology	8	1	0	9	14	1	24
Division of General Physiology	3	3	0	6	2	2	10
Division of Zoology	6	2	1	9	13	4	26
University Botanical Garden and Museum	3	3	3	9	3	1	13
Zoological Museum	0	6	2	0	8	8	16
Department of Biochemistry	10	0	0	10	6	1	17
School of Pharmacy - Section of Microbiol	1	2	0	3	2	0	5
Institute of Basic Medical Sciences	0	2	1	3	2	1	6
Department of Anatomy	8	3	0	11	18	2	31
Department of Physiology	6	0	0	6	11	5	22
Department of Medical Biochemistry	7	0	0	7	9	9	25
Department of Neurophysiology	5	0	0	5	4	6	15
Neurochemical Laboratory	1	0	0	1	1	0	2
Institute for Experimental Medical Researc	2	1	2	5	7	2	14
Department of Oral Biology	7	5	1	13	5	0	18
<b>University of Bergen</b>	<b>66</b>	<b>45</b>	<b>12</b>	<b>123</b>	<b>134</b>	<b>57</b>	<b>314</b>
Department of Molecular Biology	0	0	1	1	8	3	12
Department of Botany	5	5	1	11	9	5	25
Department of Fisheries and Marine Biolog	8	9	2	19	27	15	61
Department of Microbiology	4	4	2	10	11	5	26
Department of Zoology	8	12	0	20	20	6	46
The Gade Institute - Department of Microbi	5	1	2	8	6	3	17
Department of Physiology	10	2	0	12	14	6	32
Department of Anatomy and Cell Biology	6	3	1	10	10	2	22
Department of Biochemistry and Molecular	9	7	1	17	19	4	40
Department of Clinical Biochemistry	2	1	0	3	3	1	7
Department of Paediatrics (incl. med. genet	8	0	2	10	4	2	16
Centre for studies of Environment and Resc	1	1	0	2	3	5	10
<b>NTNU</b>	<b>32</b>	<b>27</b>	<b>14</b>	<b>73</b>	<b>76</b>	<b>37</b>	<b>186</b>
Department of Botany	4	7	3	14	12	5	31
Department of Zoology	5	10	1	16	10	4	30
Department of Biotechnology	8	1	0	9	21	10	40
Department of Physiology and Biomedical	4	1	0	5	2	2	9
Department of Cancer Research and Molec	2	2	0	4	7	2	13
Department of Morphology	2	3	5	10	0	0	10
UNIGEN - Centre for Molecular Biology	0	0	0	0	12	9	21
Museum of Natural History and Arceology,	0	0	0	0	0	0	0
Botanical Section	2	0	3	5	6	0	11
Trondhjem Biological Station	3	1	0	4	4	3	11

Table 7

Zoology Section	2	2	2	6	2	2	10
<b>University of Tromsø</b>	<b>25</b>	<b>29</b>	<b>4</b>	<b>58</b>	<b>52</b>	<b>7</b>	<b>117</b>
Department of Biology	4	12	1	17	12	3	32
Tromsø Museum, Botanical Department	0	3	1	4	2	0	6
Tromsø Museum, Zoology Department	1	3	0	4	2	0	6
Institute of Medical Biology	0	0	0	0	0	0	0
Department of Arctic Biology/Zoophysiol	2	1	0	3	6	2	11
Department of Biochemistry	3	2	0	5	9	0	14
Department of Biotechnology	1	0	0	1	0	0	1
Department of Gene Biology	..	..	..	..	..	..	..
Department of Immunology	1	1	1	3	2	0	5
Department of Medical Biochemistry	3	2	0	5	2	0	7
Department of Medical Physiology	4	0	0	4	5	0	9
Department of Medical Microbiology	4	4	1	9	4	0	13
Department of Molecular Cell biology	1	1	0	2	3	1	6
Department of Virology	1	0	0	1	5	1	7
Department of Molecular Genetics	0	0	0	0	0	0	0
<b>Norwegian College of Fisheries Science</b>	<b>10</b>	<b>14</b>	<b>3</b>	<b>27</b>	<b>27</b>	<b>6</b>	<b>60</b>
Department of Marine Biochemistry	3	5	1	9	10	6	25
Department of Marine and Freshwater biolc	2	6	1	9	10	0	19
Department of Aquatic Resources and Envi	5	3	1	9	7	0	16
<b>The University Courses on Svalbard, Biol</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>4</b>
<b>Total 1995</b>	<b>220</b>	<b>153</b>	<b>44</b>	<b>409</b>	<b>430</b>	<b>164</b>	<b>1003</b>

Source: NIFU