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# CHEMISTRY RESEARCH FUNDING SCENE IN SWITZERLAND

## OVERVIEW

The legislation on research of 7 October 1983 puts the onus for the promotion of scientific research on the Confederation, which in turn has created various instruments including in particular the Swiss National Science Foundation (SNF) and the Commission for Technology and Innovation (CTI) to carry out this task.

The SNF is funding bottom-up and top-down research projects whereas the CTI is funding applied research. There is no interference of the two organisations.

### Basic research funded by the SNF

The SNF is a private foundation mandated by the confederation. The main task is to foster the Swiss research community, which also includes an exchange with other countries (collaboration, networking, transnational activities etc.). Basic research guidelines are determined by the SNF research council, whereas top down programmes are decided by the government. Almost all instruments of the SNF are open for chemistry, e.g. project funding, fellowship grants, exchange programmes, woman grants, SNF-professorship grants etc.

### Organisation of the SNF

The *Foundation Council* is the governing body of the SNSF, which was founded in 1952. The Foundation Council has representatives of the scientific and research communities, the Federal Government and the Cantons as well as economic and cultural institutions.

It ensures compliance with the aims of the Foundation defines the position of the SNF on fundamental questions of research policy and, in this context, issues planning documents such as the Multi-Year Program. The Foundation Council is composed of representatives of the country's major scientific and scholarly institutions (universities, specialized institutions of higher education, academies, Conference of Chancellors, etc.), plus Federal Council appointees from the political and economic sector. The Foundation Council meets at least once a year and consists of a maximum of 50 members. Important tasks not expressly entrusted to the Foundation Council or to some other body of the Foundation are carried out by a 15-member Executive Committee of the Foundation Council. These tasks include appointing the members of the Research Council, framing the agreement on the Foundation brief in conjunction with the federal authorities, short-term financial planning (forecast and distribution plan) and the promulgation of guidelines central to the work of the other bodies of the SNF. The Executive Commission meets at least four times per year.

The *Research Council*, which is divided into four Divisions, evaluates research projects and makes decisions about awarding grants. The Local Research Commissions award fellowships for prospective researchers and assist the SNSF with the evaluation of grant applications. The National Research Council is the academic conscience of the SNF. It evaluates the grant proposals submitted to the SNF and decides on their approval or rejection. The work is shared by a maximum of 100 scientists and scholars, most of whom teach at Swiss institutions of higher education. They are

grouped into specialist divisions and expert commissions: Humanities and Social Sciences (21 + 5 members); Mathematics, Natural and Engineering Sciences (22 members); Biology and Medicine (30 + 4 members); plus a division dedicated to Research Programmes (20 members). The work of the Research Council is reviewed and co-ordinated by an Executive Council composed of representatives of the various divisions. The Presidency also works out and issues Research Council recommendations on research policy for presentation to the Foundation Council. The focus here is on the ground rules of promotional policy, the individual instruments of promotion, evaluation methods and the allocation of resources to the various scientific and scholarly disciplines.

The *Local Research Commissions* active at Switzerland's universities and other institutions of higher education support the grant-making activities of the SNF through their knowledge of the specific local situation (individual institutional infrastructures, priorities and personnel policies). Where it is a question of the lowest rung on the academic ladder, i.e. grants for budding researchers, they make their decisions independently. For grants to more advanced researchers and research proposals from their own institutions, they put forward their views from a local perspective.

The *Secretariat*, based in Berne, does the groundwork for the business of the Foundation and Research Councils and is responsible for administrative and financial duties.

### Rough figures 2003

	2003 (Mio €)
Sum of the governmental contribution for all disciplines (basic @ program):*	281
- Sum granted for basic research in all disciplines:*	218
- Sum granted for program oriented research in all disciplines:*	62
Total amount granted for projects in basic research:	170
Division II: natural and engineering science (including informatics)	
- Sum granted for bottom-up projects:	68
- Amount of projects:	580
o Sum granted of that for chemistry:	13.5
o Amount of projects:	111
o Special programmes (CERC3 4 projects)	0.43

Converted from CHF in € with a factor of 1.5

\* comprising: project grants, personal fellowships, conferences, international collaborations

### Applied research funded by the CTI

The Commission for Technology and Innovation (CTI) is the federal agency promoting applied research and development of economic interest. The CTI promotes development and application of new technologies.

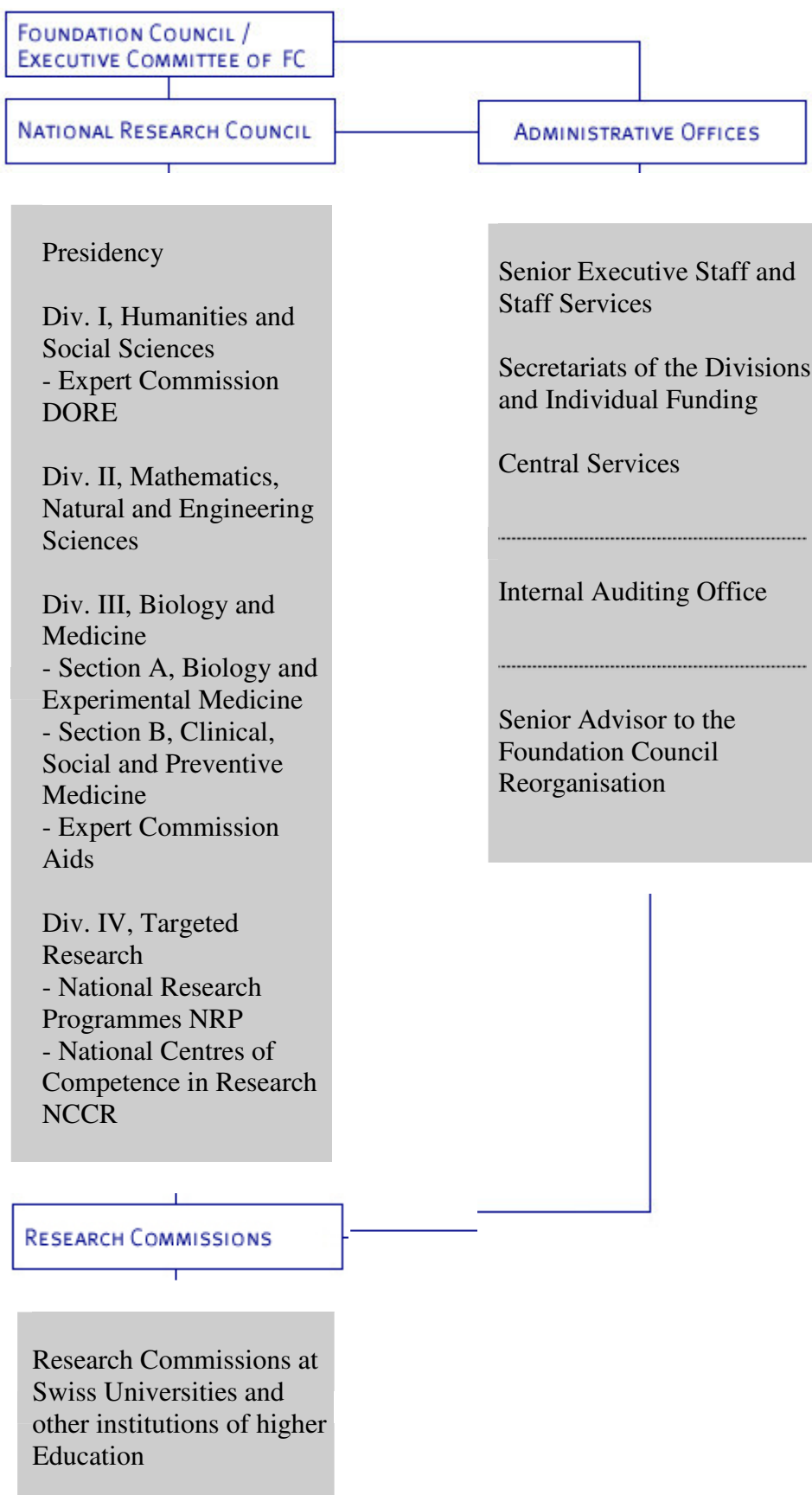
**Rough figures 2003**

	<b>2003 (Mio €)</b>	<b>Total 2001-2004 (until 19.05.2004)</b>
Projects granted in the discipline Chemical Engineering:		
- Amount of projects:	5	12
- Sum of governmental contribution:	0.58	1.9
- Sum of economic contribution:	0.89	3.1
- Sum government and economy:	1.47	5.0
Projects granted in the discipline Chemistry (Biochemistry/Pharma):		
- - Amount of projects:	5	18
- Sum of governmental contribution:	1.0	3.5
- Sum of economic contribution:	2.9	8.1
- Sum government and economy:	3.9	11.6

Converted from CHF in € with a factor of 1.5

Closer collaboration between the SNF and the CTI for projects in between the selection criteria of both organisations is in progress.

## Organisation – Organes



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Acting on a mandate issued by the Swiss Federal Government, the Swiss National Science Foundation (SNSF) supports research undertaken inside and outside universities and fosters young scientific talent. The Foundation Council is the governing body of the SNSF, which was founded in 1952. The Foundation Council has representatives of the scientific and research communities, the Federal Government and the Cantons as well as economic and cultural institutions. The Research Council, which is divided into four Divisions, evaluates research projects and makes decisions about awarding grants. The Local Research Commissions award fellowships for prospective researchers and assist the SNSF with the evaluation of grant applications.

**Funding figures**

The SNSF funding for basic (bottom-up) chemistry research was about 14 million euros in the year 2003 (including the funding of CERC3). The total SNSF research funding was 218 million euros in the year 2003. 170 million euros of this sum was allocated to project funding in basic research. The share of chemistry is thus about 8 % of the total basic research funding. In addition to this, government allocated SNSF around 62 million euros for top-down programmes.

**Position, aims, strategies**

The Swiss National Science Foundation SNFS is a private foundation that funds all disciplines. The SNSF is financed by the federal government. The SNFS, which operates according to the principle of scientific independence, is the largest Swiss institution for funding basic research. The primary focus of its activities is to promote independent basic research and to foster young scientific talents. With its interdisciplinary and problem-oriented research programmes, the SNFS attempts to provide scientifically sound solutions to problems of social significance and to develop scientific centres of excellence for certain subject areas. These top-down programmes are decided by the government and they cover about 20% of SNFS total research funding while 80% of the research funding goes to free basic research. SNFS does not co-operate with other chemistry research financiers in Switzerland.

New research programmes are determined by the SNFS Research Council (and approved by the Presidency of Foundation Council), top down programmes are decided by the government. The Research Council prepares a 4 years plan (ex. 2004-2007) which then is ratified by the Foundation Council. This Pluriannual Programme defines the principal objectives for research promotion policy over the medium and long term and indicates the instruments and measures with which these goals are to be achieved. However, members of the SNFS bodies also comment on current scientific and research policy issues outside the guidelines defined in these periodic programmes.

Researchers can also suggest new funding instruments. In the Foundation Council there are representatives of political, economic and cultural sectors. SNFS activities are guided by the

government's programme paper "Promotion of Education, Research and Technology 2004 - 2007". SNSF has to correct its own guidelines so that they are in accordance with the above mentioned paper and notify government how these goals will be achieved. This is formulated in the performance agreement between SNSF and federal authorities

As in all fields of basic research, the chemistry researcher is free to choose his topic and the evaluation is performed based on a peer review system. There are no priorities for chemistry funding. In chemistry-dominated interdisciplinary projects medicine (pharmacy), material, environmental and earth sciences are most often included. In physical chemistry 36% of the funds are allocated to interdisciplinary projects, in inorganic chemistry 23% and in organic chemistry 52%.

### **Decision making bodies**

The *Research Council* is the scientific conscience of the SNSF and is in charge of evaluating the grant proposals submitted to the SNFS and deciding on their approval or rejection. The work is shared by a maximum of 100 scientists and scholars, most of whom teach at Swiss institutions of higher education. They are grouped into specialist divisions and expert commissions: Humanities and Social Sciences (division I); Mathematics, Natural and Engineering Sciences (division II); Biology and Medicine (division III); plus a division IV dedicated to Research Programmes. The work of the Research Council is reviewed and co-ordinated by Executive Board (presidency) composed of the president and vice-president of the 4 divisions and the president of the Research Council. The Executive Board decides on the funding rules, the individual funding instruments, evaluation methods, the allocation of resources to the various scientific and scholarly disciplines and ratifies the individual funding decisions. The Executive Board also proposes Research Council recommendations on research policy to the Foundation Council.

The *Foundation Council* ensures the compliance of SNFS actions with the aims of the SNFS, it defines the position of the SNFS on fundamental questions of research policy and issues planning documents such as the Pluriannual (perennial) Program. The Foundation Council has representatives of the scientific and research communities, the Federal Government and the Cantons as well as economic and cultural institutions. The Foundation Council meets at least once a year and consists of a maximum of 50 members. Most Swiss research organisations can appoint representatives to Foundation Council. Important tasks not expressly entrusted to the Foundation Council or to some other body of the Foundation are carried out by a 15-member Executive Committee of the Foundation Council. These tasks include appointing the members of the Research Council (anyone in Switzerland can apply these positions), framing the Performance Agreement between SNSF and federal authorities, short-term financial planning (forecast and distribution plan) and the promulgation of guidelines central to the work of the other bodies of the SNFS. The Executive Committee meets at least four times per year. The Executive Committee consists of 10 members of the Foundation Council and 4 members appointed by the federal government.

The *Local Research Commissions* at Switzerland's universities and other institutions of higher education support the SNFS. They award some fellowships and assist the SNFS with the evaluation of grant applications by providing comments on the specific local situation.

## Funding instruments

Almost all instruments of the SNFS are open for chemistry. Research promoting opportunities in SNFS are project funding, fellowships and awards, publication grants, conference grants, promotion of international cooperation, and special programmes. The most important one is project funding (ca. >90%) followed by personal grants (5%). SNFS does not directly support laboratories but researchers. Occasionally equipment necessary for the proposed research is allocated and this can be used by the whole laboratory.

Project promotion includes both independent free research without a predefined theme and targeted research (research programmes) and extends to all scientific disciplines and specialist areas. Free research is about 78% of the total research funding and targeted research about 22% of the funding. The targeted research covers various national research programmes that SNFS is in charge of. These individual research programmes typically have politically defined aims and topics, run for a limited period, are interdisciplinary and are carried out in cooperation with non-academic partners with a direct or indirect interest in exploiting the research results. There are currently three different types of research programmes: National Research Programmes, Swiss Priority Programmes, National Centres of Competence in Research. Themes and topics are chosen by government or parliament.

### Free Research (project funding)

The Swiss National Science Foundation awards research grants for independent free research in all scientific disciplines. Applications are submitted by the researchers themselves and then assessed by the Research Council. The researchers are free to choose their research topics. Grants are awarded on a competitive basis, all the competitors having an equal chance.

### *Funding principles*

The average size of funds is approximately 60 000 euros per year for chemistry projects. Length of a funding period is two years. It is possible to prolong the funding period and extend the funding. This requires a follow-on application that is not peer reviewed any more. The follow-on funding period is usually 2 more years.

Salaries (incl. social costs), travel, equipment, consumables, and other costs can be funded. Funding does not cover the overheads. SNFS funding is exempt from VAT. For equipment VAT is paid to the grant holder. It is not possible to pay the salaries of permanent staff. Modifications of the originally decided budget are possible in a limited extent but need scientific justification for approval.

Established researchers employed by a Swiss research institution can be granted funding. It is possible to grant funding to a foreigner working in Switzerland if employed at a Swiss research institution, but it is not possible to grant funding to foreign institute or university. SNFS has signed the “Money follows co-operation line” agreement but considers it so far as being an experiment, not a rule.

When researcher is moving to another institute within Switzerland (s)he can have his funding with him/her but this needs an approval from SNFS. While moving to another country transfer of money is possible only for a limited time period and has to be approved by SNFS. SNFS has signed the “money follows researcher agreement” but each case has to be considered individually.

#### *Application processing and peer review*

There are 2 calls per year (deadlines 1st March and 1st October). Applicants are informed within 6 months of the submission deadline whether their application has been approved or refused. The application should be filled in SNFS-format including budget and research plan, CV of all applicants, publication list(s), list of suggested reviewers (5-10), offers for planned purchase of equipment.

There is special application form (in German and French, main points available in English). There are also instructions that include comments concerning each question [http://www.SNFS.ch/de/app/apf/apf\\_rd2.asp](http://www.SNFS.ch/de/app/apf/apf_rd2.asp), not available in English). The applications are required in German or French and English translation, or only in English. The scientific part must be written in English for external evaluation. So far, there is no electronic service for submitting proposals.

Applicant can propose reviewers, and the final selection of reviewers is made by the Research Council member in charge of a certain proposal. The Research Council member usually selects 1-2 of the reviewers that the applicant has suggested. Altogether 3-8 reviews are asked for one proposal. A reviewer need to be an expert in the requested field, usually professor or assistant professor. More than 80 % of the reviewers are international.

Evaluators are given 5 weeks for the review. One reviewer usually evaluates only one proposal. If there are more than one proposal from the same applicant the reviewer evaluates them all so that (s)he can compare them. Reviewers are not paid for the evaluation, only exceptionally in time-consuming cases.

Evaluation criteria are the following: current scientific interest and impact of the project, originality of the work, suitability of the methods, feasibility of the project, experience and past performance of the applicant, specific abilities of the investigators. Scale poor, satisfactory, average, good, very good, excellent is used. There is a specific evaluation form and instructions (in English).

#### *Decision making and follow-up of the projects*

In case of a chemistry proposal, the Research Council of Division II comprising 21 members does a provisional decision which is ratified by the Executive Board of the Research Council. Based on external reviews and the proposition of the Research Commission (located at each university) and his/her own scientific judgement (his/her own experience as an expert in the field) the Research Council member in charge of a certain application writes a report which is presented and discussed by the Research Council of Division II. The whole Research Council discusses and makes a recommendation on funding on the basis of this proposition. The provisional decision is then ratified by Executive Board of the Research Council.

Besides scientific quality funding level already granted, past performance of the applicant(s), duplication and logistics are considered in the decision-making.

Research Council members read the report of the Council member in charge of the proposal before the meeting. The report includes an analysis of the reviews. There are 21 members who discuss about 650 applications in twelve meetings per year. One Research Council member thus reads about 30 proposals per year. All decisions are summarized in the minutes of the Research Council meeting. The member in charge has to present the proposal to the Research Council within 5 months after the deadline of applications.

Most proposed budgets have to be cut for financial and scientific reasons. Even if a project is scientifically top excellent, the Research Council has to cut the proposed budgets, because of the overall amount of money available and the large number of excellent projects. Financial cut is made in a way which does not inhibit the project or some tasks of it. If the budget is cut there is no negotiation with the applicant. PhD salaries are fixed on a national level, other salaries vary according to location. Less than 50% of the applications are granted funding.

The applicant receives a detailed decree including budget, instructions, and specific comments if necessary. The minutes of the Research Council meeting are confidential and are not communicated to the applicant, only useful comments are forwarded.

Applicants can receive only upon request some selected parts of the reviews. The names of the reviewers are not told to the applicants or other persons. Applicants cannot improve their proposal before decision-making on the basis of the evaluation, but they can resubmit the improved proposal in a following round.

Financial reports are required every year. Scientific reports are required midterm and in the end of the project. There is a specific form for scientific report, but not available in English.

The member of the Research Council in charge of the project examines the progress and accepts or refuses the final report. If the funded project does not progress in the planned and desired way instructions from the Research Council member are communicated to the applicant.

Where necessary the information on scientific reports is used in the evaluation of follow-on projects. The success of the project is one criterion when deciding the further funding of the applicant. Interesting results are regularly published by the SNFS press service.

### **Legal and administrative considerations**

*Granting funding abroad.* No funding is granted abroad. There are legal obstacles according to the SNFS funding "reglementation". Money follows co-operation line agreement is treated only as an experiment.

*Conflict of interest.* There is a legislation called Forschungsgesetz-Verwaltungsverfahren concerning the conflict of interest. Persons with potential conflict of interest cannot participate in the decision-making process in SNFS. Conflict of interest in general is determined as belonging to the same institute, collaboration, and family bindings. In addition, Research Council member has a conflict of interest if (s)he belongs to the same university as the applicant. The reviewers are

requested to give information concerning the conflict of interest and this is controlled by the administration.

*Publicity.* There is a new legislation about publicity in preparation; personal data are to be handled confidentially. In SNFS, research plans and evaluations are treated confidentially. The applicant can get extracts of the review on request. The names of the reviewers are not told to the applicants or other persons. Reviewers are asked to treat the proposals with confidentiality and not show them to third person. The grant applicant can provide an abstract for a publicly accessible database.

*Intellectual property rights.* There are SNFS regulations for intellectual property rights. Researchers or their institutions own their inventions.

*Gender and minorities equality.* There is SNSF internal agreement for gender equality. In SNFS there is special program for women without straightforward careers, and in some programmes the age limits are eliminated for women.

*Research ethics and good scientific practices.* There are different regulations from different Ethical Institutions depending on the discipline.

*General.* The SNFS is a private foundation mandated by the confederation. The main task is to foster the Swiss research community, which also includes an exchange with other countries (collaboration, networking, transnational activities etc.).

### **Obstacles and best practices for transnational research programmes**

The SNFS is involved in wide range of international activities (ESF, CERN, IODP, D-A-CH, CERC3 etc.). CERC3 experiences should be discussed in ERA-Chemistry workshops.

Obstacles for transnational research programmes in Europe would be the extra work, different evaluation systems and administrative procedures. In addition, there might not be enough political will for common pot programme. The main obstacles in SNFS would be financial restrictions, the SNFS budget is destined for research groups based at Swiss research institutions. There is also the problem of duplication, some groups are already financed for their core activities. With the participation at transnational activities, they often expand their research field and need additional funding.

Most Swiss researchers have already a high degree of international collaboration, and projects are evaluated by using the peer review system on an international level. Therefore, transnational activities should only be carried out in fields where they can provide a clearly proved added value to the normal national funding activities. A proliferation of funding possibilities not necessarily guarantee an increase in research quality, probably the case would be the contrary.

## OTHER MAJOR FUNDING BODIES IN SWITZERLAND

### **Innovation KTI/CTI - The Innovation Promotion Agency**

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The CTI is the Swiss innovation promotion agency. "Science to market" is its creed. Its aim is the rapid conversion of state-of-the-art laboratory findings to marketable products. Hence, the CTI backs joint R&D projects involving tertiary level institutions and the industry. It aims for threefold impact:

- Strengthening market-oriented innovation processes
- Establishing practice-oriented qualifications for academic researchers and improving cooperation between educational institutions and the industry
- Ensuring more generous project funding

### **Main characteristics of funding policy and procedures**

Promotion follows the bottom-up principle: projects are defined by the participating partners themselves, with the business side covering at least half the costs. CHF 1 in federal funding generates at least CHF 1.50 additional investment by the business partner(s). The CTI budget for the 2000 to 2003 period amounts to CHF 308 million, to be increased for the subsequent period. Every additional CHF 25 million in federal funding enables about 150 new projects, in which over 200 researchers cooperate with the industry.

Eight fields of activity have been defined to facilitate access to the CTI network:

- Life Sciences
- Nanotechnology and Microsystems
- Enabling Sciences
- Engineering
- CTI – Universities of Applied Sciences (UAS)
- ISA - Innovation for Successful Ageing
- Start-up / Entrepreneurship
- International

Approximately 3700 projects have been promoted since 1986, generating R&D to the extent of about CHF 2.2 billion. Over 60% of costs were covered by industry, with the Confederation funding the rest. Over 5,000 companies were involved, 80% of which were SME. 700 project applications were submitted in 2001, and over 1000 applications per year are expected by 2007.

### **Swiss Chemical Society**

Swiss Chemical Society (SCS)

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The Swiss Chemical Society represents chemistry in the broadest sense in Switzerland and in international organizations. It notably engages in:

- Information, discussion and education in all fields of pure and applied chemistry including economical, ecological and social perspectives. For this purpose it organizes and supports scientific meetings, workshops and other activities that serve the chemical community in Switzerland.
- Activities that promote the interests of chemists in Switzerland and in international professional organizations.
- Publications

#### Activities

- Organisation of meetings, symposia and conferences
- Work out opinions to questions of education and research policies
- Link and collaboration with the Swiss academies
- Take part in international organisations
- Edition of journals (CHIMIA)
- Presentation of scientific awards