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CHEMISTRY RESEARCH FUNDING SCENE IN THE NETHERLANDS

OVERVIEW

The total amount of chemical research performed at universities in the Netherlands is estimated at 80-90 million euros per year. Most of the research is financed by the universities itself from funds directly obtained from the Ministry of Education, Culture and Science. Additional funding is obtained from industry and government. The chemical and pharmaceutical industry spends 900 million euros on research in house and 200 million euros on research outside the company, part of which is used for funding research in academia. The central public funding agency in the Netherlands is NWO; however other governmental funding organisations for applied research are Technology Foundation STW and SenterNovem.

Annually, NWO spends 400 million euros in total on research funding, and is mainly financed by the Ministry of Education, Culture and Science. NWO comprises of 8 different research councils covering all disciplines. The funding by the chemical sciences council can be divided into curiosity driven programmes, personal grants, and thematic programmes (total 23 million euros). Approximately 7.7 million euros of this funding is dedicated to applied chemistry. In addition, the NWO-affiliated task force for Advanced Chemical Technologies for Sustainability (ACTS) has a budget of 20 million euros for applied research in chemistry.

Technology Foundation STW encourages and finances excellent applied research at Dutch universities and promotes the utilization of research results by others. The yearly budget of STW comprises of 46 million euros and is achieved from NWO (60%) and the Ministry of Economic Affairs (40%). There is no fixed budget for chemistry and individual proposals from all disciplines compete with each other for funding. In the past, STW spent approximately 22% of its yearly budget on chemistry and 13% on medical sciences, which also includes medicinal and biological chemistry. Of the total budget the majority (80%) is spent on the bottom-up Open Technology Programme (OTP), while the remainder is mainly spent on top-down thematic programmes.

SenterNovem (formerly Senter) is an agency of the Ministry of Economic Affairs and promotes its policies on innovation, environment and sustainability. SenterNovem is a link between government and industry and offers consultancy, information, networking and funding. The total budget of Senter is 1.2 billion euros of which approximately 5% is spent on research; there is no fixed budget for chemistry. SenterNovem is mainly focused on small businesses, however other researchers can also apply for funding.

Alternative sources for – mainly personal – funding of chemical research are the Royal Netherlands Academy of Arts and Sciences (KNAW), programmes from the European Union, and charity organisations or private funds.

ERA-CHEMISTRY PARTNER: NETHERLANDS ORGANISATION OF SCIENTIFIC RESEARCH, NWO

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Together with scientists, (inter)national organisations and companies NWO as the central public funding agency in the Netherlands develops and funds top-quality research programmes. Eight divisions comprise (by law) all different aspects of science. They are responsible for the funding task of NWO. Each division has a Board, consisting of scientists. The divisions develop research programmes and organise granting procedures. They have considerable independency. Not seldom they offer, in various combinations, joint programmes for which the scientific field delivers the input. This 'multidisciplinarity' is an unmistakable trend in science. NWO has even based her strategy on these cutting-edge themes.

Funding figures

NWO funding for basic chemistry research was 16.5 million euros in the year 2003 and for applied chemistry research 7.7 million euros. Thus the total NWO chemistry research funding was 23 million euros in the year 2003. The total funding of NWO is about 400 million euros per year. The chemistry share of the total funding is about 6 percent.

Position, aims, strategies

NWO is the central public funding agency in the Netherlands and the funds come mainly from the Ministry of Education, Culture and Science. However, the majority of chemistry research in the Netherlands is financed and carried out by the chemical industry.

NWO's policy aims at achieving the NWO mission - to enhance the quality of scientific research in the Netherlands - as effectively as possible. The present subsidy policy can be briefly summarised as follows:

- Maintaining a substantial financial volume for curiosity driven research (in principle at the present level) [non-thematic research]
- Introducing transdisciplinary scientific themes, involving several Councils [the thematic line]
- Strengthening the person-based individual support for pioneering research by highly talented researchers [the individual research line]
- Maintaining financial resources for major investments in large scientific research equipment (incl. databases etc)

The main focal points of NWO in general as well as of NWO Chemicals Sciences are top research, talent (especially young talent), themes, international co-operation, research infrastructures, and applied chemical research. All these are promoted in different funding programmes. NWO invests heavily in renewing the research agenda. In 2001, the NWO Strategy Document identified nine

research themes. The Chemical Sciences Council strategy includes four themes that to a large extent fit in the NWO themes. These are sustainable chemistry and chemical engineering, chemistry and life sciences, molecular nano-sciences, implementation and further development of new research techniques.

NWO eight Research Councils comprise all research fields. The NWO organisation also includes two foundations; Netherlands National Computing Facilities Foundation (NCF) and Foundation for the Advancement of Tropical Research (WOTRO). In addition two Temporary Task Forces with an assignment in a particular research and technology field have a semi-permanent status and are accommodated by NWO. These are Advanced Chemical Technologies for Sustainability (ACTS) and Netherlands Genomics Initiative (NROG). Finally, NWO has nine Research Institutes across the country. ACTS is the Dutch platform for pre-competitive research in chemistry and focuses on sustainability. In ACTS major parties from industry, academia and government co-operate. NWO Chemical Sciences and ACTS have shared offices. It is expected that the ACTS budget in 2007 will be around 20 million euros; consequently the whole NWO budget for applied chemistry research in 2007 will be around 28 million euros.

There are other research funding organisations in the field of applied chemistry such as Technology Foundation (STW), and an agency of the Ministry of Economic Affairs (Senter). STW is financed by NWO and the Ministry of Economic Affairs. NWO Chemical Sciences cooperates with the STW in the programme focusing on Applied Chemistry and Chemical Engineering and in the Separation Technology Programme.

The funding strategies are decided by NWO and the priorities and instruments are determined mostly by NWO and partly by the other stakeholders. Curiosity driven research is based on bottom-up approach. Some of the thematic programmes in NWO Chemical Sciences are bottom-up and some top-down. Researchers can contact NWO and suggest fields for new funding programmes. Moreover within Chemical Sciences 16 study groups (consists of scientists) exist covering different fields of chemistry. These groups have regular meetings in which they discuss important matters in their field. The outcome of these meetings can be proposed to the Board of NWO Chemical Sciences.

The Ministry of Education, Culture and Science is involved in the preparation of the strategies and in setting specific guidelines at the Chemical Sciences Council. However, the Ministry of Economic Affairs, the Ministry of Housing, Spatial Planning and Environment VROM and the industry are involved in the case of ACTS. In addition, the Ministry of Education, Culture and Sciences gives specific tasks to NWO.

NWO legitimate planning documents are issued every four years in the form of a Strategic Plan. In Annual Reports NWO accounts for the execution of its policy in relation to its strategic plans and budgets. The NWO Councils conduct their policy within the framework of NWO's corporate policy and publish their own strategy documents and long-term plans, or make their own contribution to the NWO long-term plans.

Approximately 4% of the total NWO Chemistry budget (23 million euros) in 2003 was spent on chemistry dominated interdisciplinary projects. The disciplines most often included were earth and life sciences, physical sciences, medical and health research, physics. Some of these projects are financed by only one Research Council and some of them are funded by several councils.

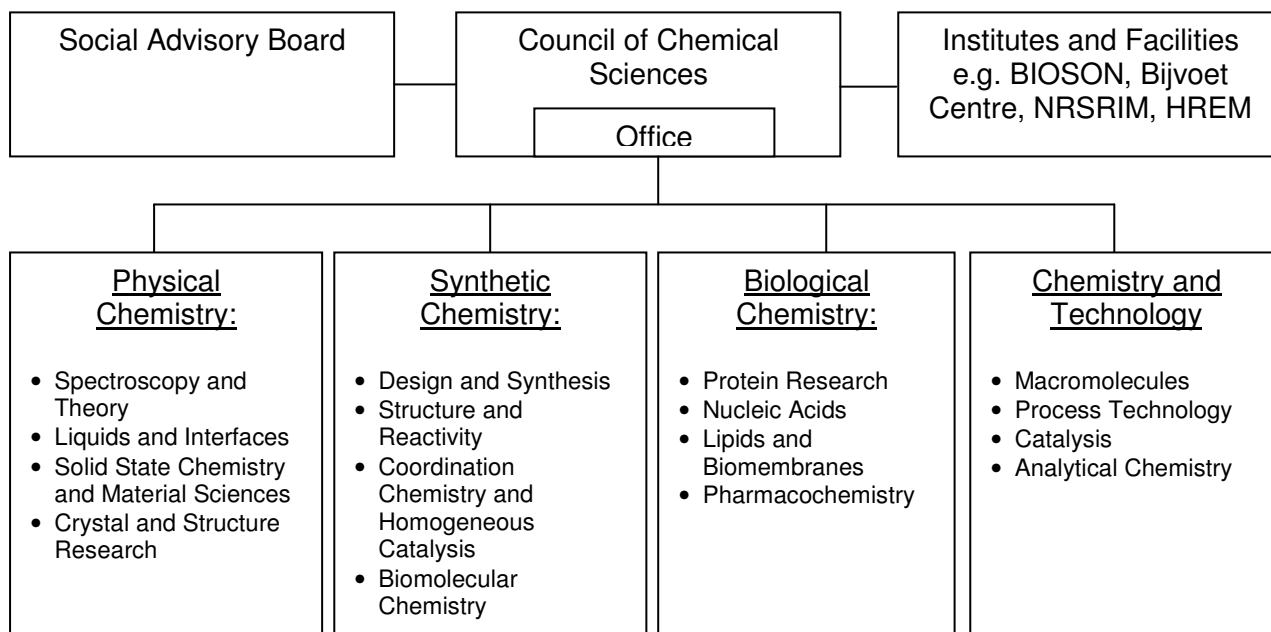
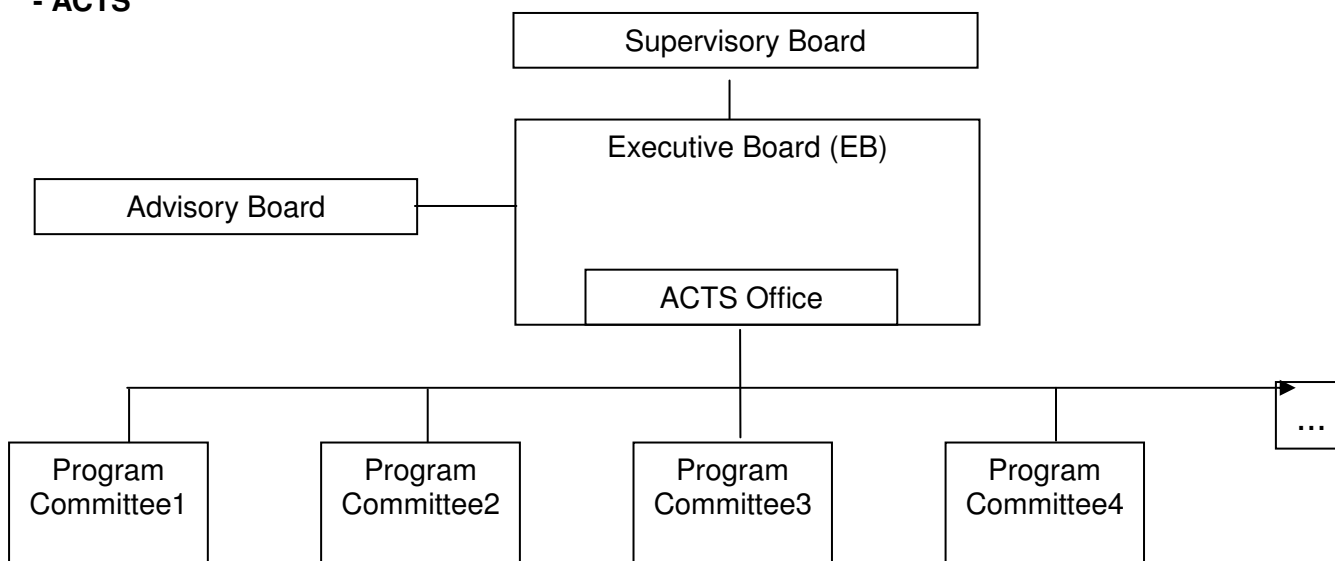
Decision making bodies

NWO has a Governing Board and an Executive Committee. The Governing Board is responsible for the policy of NWO. The Councils do not have specific representatives in this Board. The Governing Board comprises a chairman and three members and is supported by the NWO Director General. The chairman and members of the Governing Board are appointed by the Crown for a period of five years. The chairman is a full-time employee of NWO. The NWO Executive Committee has two members, a Director General and a Director Organisation and Planning.

NWO eight Research Councils comprise (by law) all disciplines. One of them is the Council for Chemical Sciences (CW). The Councils have considerable independency. They allocate subsidies and grants within programmatic limitations, develop research programmes and organise granting procedures. The Councils have their own budget, Council Board and Council Executive Committee consisting of scientists. The members of the Council are appointed by the Governing Board based on the recommendation of the Council. Currently, the Council for Chemical Sciences has 5 members. The Council can have one industrial member, this position is currently vacant.

- NWO

NWO Governing board Executive Committee Office		
<p><u>Research Councils:</u></p> <ul style="list-style-type: none"> • Earth and Life Sciences (ALW) • Chemical Sciences (CW) • Physical Sciences (EW) • Humanities (GW) • Social Sciences (MaGW) • Medical Sciences (ZonMw) • Physics (N) • Technical Sciences (STW) <p><u>Foundations:</u></p> <ul style="list-style-type: none"> • Netherlands National Computing Facilities Foundation (NCF) • Foundation for the Advancement of Tropical Research (WOTRO) 	<p><u>Research Institutes:</u></p> <p><i>Physics</i></p> <ul style="list-style-type: none"> • FOM Institute for Atomic and Molecular Physics (AMOLF) • FOM Institute for Plasma Physics Rijnhuizen • FOM Institute National Institute for Nuclear Physics and High Energy Physics (NIKHEF) <p><i>Mathematics and Computer Sciences</i></p> <ul style="list-style-type: none"> • National Research Institute for Mathematics and Computer Science (CWI) <p><i>Astronomy and Space Research</i></p> <ul style="list-style-type: none"> • Institute for Astronomical Research in the Netherlands (ASTRON) • Space Research Organisation Netherlands (SRON) <p><i>Marine Research</i></p> <ul style="list-style-type: none"> • Royal Netherlands Institute for Sea Research (NIOZ) <p><i>History</i></p> <ul style="list-style-type: none"> • Institute for Dutch History (ING) <p><i>Penal Science</i></p> <ul style="list-style-type: none"> • Netherlands Institute for the Study of Crime and Law Enforcement (NSCR) 	<p><u>Temporary Task Forces:</u></p> <ul style="list-style-type: none"> • Advanced Chemical Technologies for Sustainability (ACTS) • Netherlands Genomics Initiative (NROG)

- Council of Chemical Sciences (CW)**- ACTS****Funding instruments**Curiosity-driven Competition:

Chemical Sciences **Top Grants** are intended for top chemical research groups in order to strengthen and/or extend excellent, challenging and innovative research lines.

Personal Grants:

Innovational Research Incentives Scheme (Veni, Vidi and Vici) is aimed at giving talented, creative researchers the opportunity to conduct their own research independently and to encouraging them to enter and remain committed to the scientific profession. **Veni grants** are for researchers who have recently earned their PhD, to allow them to continue to develop their ideas (maximum 200 000 euros). **Vidi grants** are for researchers who want to develop their own

innovative line of research and to employ one or more researchers (max 600 000 euros). **Vici grants** are aimed at senior researchers to build their own research group (max 1 250 000 euros).

Aspasia programme was designed to help female university lecturers attain senior positions within the universities. **MEERVOUD** aims at increasing the number of female chemical lectures within the universities. **Mozaic** programme is designed to attract more ethnic minority graduates into academic research in order to promote diversity.

As part of the **TALENT** programme researchers with a PhD degree from all research fields can apply for scholarships for a visit to a research institute abroad of at least 3 and at most 12 months. Other personal grants are **NWO/Spinoza prize** (1.5 million euro) as stimulus to promote the research of excellent scientists and European Young Investors Award (**EURYI**).

Investments Subsidies:

NWO-Large Investments (subsidies for investments larger than 900 000 euros), NWO-Medium Investments (subsidies for investments between 110 000 and 900 000 euros)

Thematic programmes and projects:

Mayerne Programme, From Molecule to Cell, Process Innovation for a Cleaner Environment, CERC3 Transnational Research Programme Chemistry (Nucleic Acids and Sustainability), Biomolecular Informatics Science, Material Research, Combinatorial Chemistry, ACTS IBOS (Integration of Bio- and Organic Synthesis) Programme, ACTS Sustainable Hydrogen Programme, Computational Chemistry of Biosystems (CW/Unilever), ACTS ASPECT (Advanced Sustainable Processes by Engaging Catalytic Technologies) Programme, ACTS PoaC (Process on a Chip) Programme, ACTS B-BASIC (Bio-based Sustainable Industrial Chemistry) Programme, Supramolecular Chemistry and Technology, Separation Technology, Softlink, Sustainable Technology (the Netherlands - Japan), CW/STW-programme Applied Chemistry, EUROCORES-programme Self-Organised Nano-Structures, Priority Programme Materials (PPM)

Internationalisation:

TALENT (see above), NWO financial support for the preparation of FP6 projects, Cooperation between the Netherlands and Russia, Cooperation between the Netherlands and Germany, Chemical Research travel grants, ESF EUROCORES-programmes (Self-Organised Nano-Structures, Euroscope), ERA-Chemistry, ERANET ACENET, Japan Programme

In the year 2003, the Research Council of Chemical Sciences granted to curiosity driven competition 6 million euros, to personal grants at least 7.2 million euros, to thematic programmes and projects at least 25 million euros. The exact amounts are not known, since the budgets are not divided per NWO Council. The Council of Chemical Sciences funds both projects and persons and never grants a subsidy to a laboratory. About 65-75 % of the funding is project-based and 25-35 % person-based.

Thematic Programmes: As an example the CombiChem (Combinatorial Chemistry) programme

CombiChem program focuses on the development, investigation, use and application of combinatorial chemistry. The research in the program focuses on the two themes: 1) development of combinatorial (solid phase) synthesis methods, 2) analysis methods of libraries and extension of the number of applications of combinatorial chemistry.

Funding principles

The average size of a CombiChem fund is 300 000 euros for 4 years. The length of the funding period is 4 years. It is not possible to prolong the funding period or extend the funding. Personnel costs (1 PhD student and/or 1 Postdoc), consumables (10 000 euros per person-year) and small investments up to 50 000 euros can be funded. The funding includes VAT. Salaries of permanent staff cannot be paid. Funding does not cover overheads. The overhead of the Dutch research institutes and universities is about 50% of the total costs of the project.

Eligible applicants are permanent staff of the given Dutch universities and research institutes. Foreigners permanently employed at Dutch host institutes can be funded but it is not possible to grant funding to foreign institute abroad. The money follows cooperation line scheme has not been applied up till now in NWO. If industry participates in a programme granting funding abroad or taking funding abroad is rather complicated because of intellectual property rights.

It is possible to transfer funding to another university or institute in the Netherlands if very good arrangements are made with both the old and the new employer and if it is requested to and approved by the CombiChem Programme Committee and by the director of NWO. Taking funding to Germany is arranged by the Money follows researcher program, and with some other countries in Europe an agreement is concluded, making transfer of funding possible. However, each case has to be evaluated individually. Taking money to other countries outside these arrangements is not possible.

Funds can be used for other purposes than originally planned. However, it has to be requested to and approved by the CombiChem Programme Committee and depending on the extent of the deviance, by the Board of the Council of Chemical Sciences or the director of NWO.

Application processing and peer review

There have been two calls in the CombiChem programme so far. The calls have been performed in two stages (pre-proposals and full proposals). The deadlines for submission of the full proposals were on 01-11-2001 and on 31-01-2003. It takes approximately 5 months from full application to decision and 9 months from the pre-proposal.

There is a special application form (in English) that inquires personal data of the applicant, the members of the research team, a summary of the proposal, a full description of the research proposal, a time-schedule, costs estimates and a selection of the top publications of the applicant related to this proposal. For the pre-proposals (in English) as well as for the full proposals (not in English) a brochure was made. Applications are required in English. NWO has an electronic service for submission. Hardcopy submission is not possible anymore.

When the pre-proposals are received, a selection of these is made by the Programme Committee. The Programme Committee is appointed by the Board of the Council for Chemical Sciences. There are three representatives of industry and four scientists. The pre-proposals must meet at least the following criteria: the proposal must contain excellent scientific research with an innovative approach, the research should be focussed on combinatorial chemistry and should fit in the mentioned research themes. Besides these conditions the Program Committee pays attention to the

relevancy for the industry and the coherence and strengthening with the other proposals. After the selection the applicant is advised whether or not to submit a full proposal.

The pre-proposals and the final proposals are presented for adoption to the companies involved in the Research Program Committee. These companies can adopt a proposal and give additional funding to it. The applicants were therefore encouraged to consult one or more of the industrial members of the Program Committee before applying. The total contribution of an industrial partner to the programme was agreed before the start of the programme.

The scientific quality of full proposals is evaluated by independent reviewers. The scientific reviewers are chosen by the NWO administrators based on the recommendation of the Programme Committee. Applicant can suggest non-reviewers. Scientific reviewers should be more senior than the applicant (at least associate professor or professor) and they should be an expert in their field. All the scientific reviewers are international.

In addition, the proposals are given industrial reviews. The industrial reviewers are proposed by the industrial members of the Programme Committee. One of the experts is from the company that intended to adopt the proposal, and the other reviewer from the other two companies involved. These reviewers are not the same persons as the industrial representatives in the Programme Committee.

Reviewers receive only one proposal at a time and they have at least 3 weeks for the evaluation. They are not paid for the evaluation. 3 academic reviews and 2 industrial reviews are given for one proposal. Reviewers receive a special review form (different one for academic and industrial reviews, both in English) and specific instructions (both in English). The evaluation criteria for scientific evaluation are originality and aims, scientific approach and methodology, extension and deepening the knowledge and understanding of combinatorial chemistry, international position of the proposed research, interest of the project in the long term, scientific quality of the research group, requested personnel and equipment. The criteria for industrial evaluation are the relevancy of the proposed research for Dutch industry, the results to be expected from the proposal and which of these are relevant to Dutch industry, innovativeness of the research compared to industrial research. The applicant has the opportunity to respond to the reviews (both scientific and industrial) in the rebuttal letter.

The Programme Committee ranks the proposals. All the members read all the applications, reviews and rebuttal letters of the applicants in advance. On the basis of the scientific evaluation, the rebuttal letter, possible interviews and the industrial relevance the Program Committee prepares a short motivation for funding/rejection of a proposal. This motivation is written by an administrator and approved by the Programme Committee. In the Committee approximately 10 proposals are processed by the 7 members.

The applicants receive the full evaluations of the individual reviewers (both scientific and industrial) and the written motivation of the Programme Committee. The names of the reviewers are not told to the applicants or to other people. The composition of the Programme Committee is public. Applicants cannot adjust the original proposal on the basis of scientific reviews, but they can write a rebuttal letter to defend themselves.

Decision-making and follow-up

The Board of the Council of Chemical Sciences decided on funding based on the priority list prepared by the Programme Committee. The pre- and full proposals had to meet at least the following criteria: the proposal must contain excellent scientific research with an innovative approach, the research should be focussed on combinatorial chemistry and should fit in the mentioned themes of research. The projects were granted in order of ranking at the priority list. In this way the best projects were granted until all the money was spent.

For the CombiChem grants a maximum of 300 000 euros can be applied for. Generally, the applicants got the amount they applied for. In one case (lowest ranked project that was still granted) the budget was cut, due to the fact that there was not enough money left to fund the total budget requested. If the budget is cut there are no negotiations with the applicant. Around 20 % of the pre-proposals were funded.

Projects have to write a progress report twice a year. The report form is available in English. The progress reports are sent to the Programme Committee for evaluation. If the project does not progress well enough the Programme Committee will be consulted to try to re-direct the project. If the problems are not solved in that way NWO can stop further funding of the project.

With permission of the researchers and the company involved, the results can be used for publicity purposes. Formally the success of the project does not influence further funding of the applicant. However, it influences the performance of the researcher and consequently affects the chance of future funding.

Open Competition: as an example the TOP Grants

Chemical Sciences Top Grants are intended for top chemical research groups in order to strengthen and/or extend excellent, challenging and innovative research lines.

Funding principles

TOP Grants are at the moment 500 000 euros. The funding period is 5 years. It is not possible to extend the funding and the funding period can only be prolonged by applying for a new TOP grant.

Personnel costs, materials (inexpensive apparatus, consumables etc.) and expensive apparatus can be funded. Permanent staff cannot be funded. Funding can be granted to professors, associate professors and other researchers permanently employed by a university or institutes recognized by NWO, belonging to the chemical top research groups in the Netherlands. Each research group can only apply for one TOP grant.

It is possible to use funds for other purposes than originally planned. However, it has to be requested to and approved by, depending on the extent of the deviance, the Board of the Council of Chemical Sciences or the director of NWO.

Application processing and evaluation

There is one call per year. The call for proposals for TOP Grants is announced via a newsletter, the website and via mailing to researchers within the field. The call is performed in two stages (pre-proposals and full proposals). The deadline for the pre-proposals was on 01-10-2003 and for the full proposals on 07-01-2004. From the pre-proposal to the final decision it takes 9 months and from the full proposals to decision it takes 6 months.

The application form and explanation for pre and full proposals are available on the website (in English also). The full application form includes personal details of the applicant, participating group members, a summary of requested funding, summary of the proposed research, past performance, full description of the proposal and publications. Applications are required in English.

The Board of the Council of Chemical Sciences puts together a Committee in which chemistry-board, independent and experienced researchers participate. Pre-proposals are sent to the Committee and they will select approximately the best 60-70% of the total number of pre-proposals based on the following criteria: the application should fit within the definition Chemical Sciences, past performance, scientific quality of the research proposal, and innovative character. The selected applicants are advised to write full proposals. This selection is confirmed by the Board of the Council of Chemical Sciences.

The full proposals are sent for peer review. The reviewers are chosen by the NWO administrators based on the suggestions from various study groups, committees and researchers. Applicants can also propose reviewers. Reviewers should be independent and experts in the field. All the reviewers are international. Reviewers receive instructions and a special referee form. 3-4 reviews are given for one proposal. The evaluation criteria are past performance of the group; quality of the research proposal (originality, scientific approach, achievable in the time scale); innovative aspects. The proposal is rated on the scale poor, fair, good, very good, excellent). The applicants have the opportunity to write a rebuttal to respond to the comments of the reviewers.

The Committee ranks the projects based on the full proposals, the comments of the reviewers and the rebuttal of the applicant. It is possible to invite part of the applicants for an interview to further explain their project. Based on the discussion in the Committee the administrator writes a short motivation for funding/rejection of a proposal that is approved by the Committee. All the Committee members read all the applications, evaluations and the rebuttal letters in advance. There are about 10 Committee members and about 30 proposals in one Committee.

The applicants receive the full evaluations of the individual reviewers. The evaluation of the Committee is not automatically sent to them. However, it is possible to request a summary of this information. The names of the reviewers are not told to the applicants or to other people. The composition of the Committee is published when the whole procedure is finished.

Decision-making and follow-up

The Board of the Council for Chemical Sciences decides on funding based on the ranking list prepared by the Committee. The projects are granted in order of ranking in the priority list. Decision-making criteria are thus the same as evaluation criteria.

For the TOP Grants maximally 500 000 euros can be applied for. If the project is funded, the budget is not cut. The fee for personnel costs is paid according to agreements between NWO and VSNU (Association of the Dutch Universities), so fixed salaries are paid. Each year the budget is 6 million euros and the 12 best proposals can be funded. Around 30-35 % of the proposals are funded.

Every year the project leaders are requested to deliver some basic information on their projects (e.g. personnel and publications). A midterm report including a brief scientific report is requested. This report is discussed in the Board of the Council for Chemical Sciences. Also at the end of the project a brief scientific report is requested from the project leaders. Approval of this report by the Board of the Council for Chemical Sciences is required for the financial winding up of the project.

Formally, if the project does not progress in the planned way NWO can stop further funding of the project. It is not yet decided how to utilize the information in scientific reports, since the first TOP grants started just 2 years ago.

Personal grants like Veni, Vidi, Vici, MEERVOUD, ASPASIA etc.: As an example the Vidi programme

Funding principles

Vidi grant is targeted at outstanding young researchers who have completed their doctorates and already conducted post-doctoral research for some years. They must be capable of developing their own innovative lines of research and appointing one or more researchers to assist them. Candidates can submit proposals in the period beginning 3 years and ending 8 years after they have received their doctorates. Full professors may not compete for Vidi funding.

Vidi grants are 600 000 euros for a 5-year period. NWO will pay 405 600 euros, the rest will be contributed by the host institution. The budget may exceed the maximum of 600 000 euros but NWO's contribution will never be more than 405 600 euros. When the budget is larger than 600 000 euros the institution (or a third party) must send NWO an authorised letter guaranteeing to meet the additional costs.

Following expenses can be paid: gross salary of the candidate plus up to 70% of that sum to cover employers contributions (holiday pay etc), acquisition costs of materials and equipment or databases, travel and subsistence costs associated with attending conferences and visiting other research institutes, gross salaries of additional staff (PhD students, post-docs, technicians) plus 35% of that sum. It is also possible to fund permanent staff.

During the application process it is still possible to move to another university or institute if the new employer is willing to guarantee the eventual structural integration of the intended research and the financing of 32.4% of the total budget. After the project is granted and started it is much more complicated to take the funding to another university or institute. It is only possible if very good arrangements are made with both the old and the new employer.

Application processing

There is one call per year. The last deadline for submission was on 17-02-2004. It takes about 6 months from application to decision.

Application must contain an application form including the candidate's curriculum vitae, list of publications, outline of the research proposal and costs estimates. Moreover an institutional guarantee has to be attached concerning the eventual structural integration of the intended research and the financing of 32.4% of the total budget. There is a special application form and instructions to prepare the proposal. Applications are required in English.

Applications will be screened by the NWO secretariat to ensure that they comply with the formal requirements of the scheme (e.g. applicant can submit only one application, restrictions for those who have earlier received grants). Only applications judged to be acceptable will go forward for possible selection.

Evaluation of the proposals

If extremely large numbers of Veni or Vidi grant applications are received, Councils will be entitled to operate a short-listing procedure based solely on the detailed applications. This may only be done if the number of applications is at least four times the number of grants available. Where a Council decides to use short-list, applicants will be informed of this in the procedure accompanying the letter confirming receipt of application. All the applications will be discussed and compared by a broad-based Selection Committee which will rate them in terms of their chances of success. The Council for Chemical Sciences appoints the Committee. The members should be experts in their field (generally professors) and they cannot have a conflict of interest with the applicant. Those applicants judged least likely to be awarded a grant will be notified that they have not been short-listed for further consideration. They will then have an opportunity to respond to the committee's views. If persuaded by an applicant's response, the committee may decide to shortlist the relevant application after all. Otherwise, a formal decision will be taken, against which the applicant may choose to appeal.

The detailed applications are submitted to external referees for their consideration. The reviewers are chosen by the administrators. Applicants can suggest 3 non-reviewers. Reviewers should be at least associate professor or professor and they should be an expert in their field. The percentage of international reviewers is approximately 50 %. There are 2-4 reviews for one proposal.

There is a specific referee form and reviewers are sent also a Vidi Brochure. Candidates and their research proposals will be assessed on the basis of the following criteria:

- 1) Quality of the researcher: belonging to the Vidi target group; Academic excellence of the researcher; demonstrable ability to generate new ideas and bring them independently to fruition and evidence that the applicant is among the top 10-20% of his/her peer group; an established national and international reputation; inspiring enthusiasm for research or technology; persuasiveness; ability to lead and supervise other researchers and support staff.
- 2) Innovative nature of the proposed research: originality of the topic; innovative elements; potential to make a major contribution to the advancement of science or technology.
- 3) Quality of the research proposal: challenging content; suitability of proposed method.

The individual reviews are sent to the candidate in anonymous form and he/she has the opportunity to respond to it. All the Committee members read all the applications, evaluations and the rebuttal letters of the applicants in advance. There are 8-10 Committee members and 15-20 proposals are processed in one Committee. The Committee also interviews the applicants. If large numbers of applications are received, interviews need not necessarily be held with all candidates. The

Committee may decide to create a provisional short-list of the most promising candidates, based on the views of the referees and the responses of the candidates. Only they will be invited for interview.

Following the interviews, the Committee will reach its recommendations. The committee discusses the proposals and ranks them. Based on this discussion the administrator writes a short motivation for granting/rejection of a proposal that is then approved by the Committee.

When the Committee assesses the proposals, the emphasis is placed on the appraisal of the personal academic talents and potential of the researcher and the extent to which he/she satisfies the target group criteria for the particular grant form (Veni, Vidi or Vici). Only those proposals ultimately rated 'very good' or 'excellent' will be regarded as worthy of grant.

Decision-making and follow-up

The ranking list and recommendations of the Committee are submitted to the relevant Research Council that checks the ranking and submits a list of candidates to be awarded grants to the Governing Board of NWO. The Governing Board makes the final decision. 20-35% of the applications are funded. The amount of funding is fixed.

All applicants receive a letter in which they are informed about the granting or rejection of the funding of their project. The successful candidate will be given a contract of employment with the host institution of his/her choice and a contract of conditions for reporting on progress and final results.

Both a midterm and final report are required. These reports include a scientific part as well as a financial part. In the financial part a justification for the money spent has to be given. The scientific report should include overview of all the scientific publications and summary of the obtained results and achieved goals during the project. Researchers will receive a letter with instructions and a specific form on which to give their report. Formally, if the project does not progress in the planned way NWO can stop further funding of the project.

The evaluation and utilisation of scientific reports is not yet decided because first Vidi grants started just 2 years ago.

International Programme: As an example of international programmes is TALENT.

Funding principles

TALENT scholarship includes the costs of travel to the foreign destination, the additional costs of health insurance premiums associated with the period spent abroad and the costs of accommodation. The duration of the scholarship is at least 3 and at most 12 months. In case of a scholarship for ten months or longer, money is also available to cover the travel and accommodation expenses of accompanying family members.

The recipient of the fellowship must implement the programme of activities set out in the application or otherwise explicitly agreed between him/her and NWO. No change can be made to the programme without the prior consent of NWO. If the actual time spent abroad is shorter than the

period for which the fellowship was awarded, the recipient must repay an equivalent proportion of the fellowship funding to NWO.

The applicant is eligible to apply a TALENT stipend provided that (s)he has been awarded his/her doctorate within five years and that his/her doctorate has been or will be in the Netherlands or the applicant has been graduated in the Netherlands. In addition, the applicant should be either without a permanent research post appointment or has held a permanent post for no longer than three years in the Netherlands.

The TALENT programme is directed primarily to promising researchers who are still at the start of their careers and who are likely to achieve eminence in the Dutch research world. Full professors may not apply. The criteria for the award of TALENT fellowships are extremely stringent. Successful candidates will be among the best 10% of their generation in the discipline concerned.

Application processing, peer review, decision making and follow-up

Calls for applications are three times a year. The closing dates for submission are 15 January, 15 May and 15 September. It takes about 4 months from application to decision.

A complete application consists of a TALENT fellowship application form including detailed plan of activities in English, CV and list of publications. In addition following documents are needed: acceptance form for host institution, two TALENT fellowship recommendation forms, a partnership declaration (if applicable). Documents with instructions for TALENT scholarship are available on the website. Proposals are required in Dutch or in English.

The department of Central Programmes and Institutes requests the director of the individual Research Council involved to search for 3 independent and competent reviewers. Applicant cannot propose reviewers. No international evaluators are used. The reviewers receive the proposal, the recommendation letters and an evaluation form. 3-4 reviews are given for one proposal.

The Selection Committee decides on funding. There are 10 Selection Committee members and 15-30 proposals in one meeting. The chair of the Selection Committee is a member of the General Board of NWO. The other members are the General Director of NWO and the eight chairs of the individual Research Councils.

Before the Selection Committee meeting the applicants are divided in three categories by the chair of the Selection Committee, the General Director, and the Department of Central Programmes and Institutes. These categories are eligible for funding (belongs to the top ten per cent of his/her generation in the field concerned), have to be discussed, and not eligible for funding. All members of the Selection Committee can at least one week before the meeting propose to move applicants from category 1 or 3 to category 2.

Additional selection factors are: the plan of activities for the period of research abroad; the importance of the research to the discipline concerned (its innovative and pioneering nature and its knock-on effect on other fields of study); the publications list of the applicant; the quality of the host institution. Priority will be given to applicants who do not have any experience in doing research abroad. When awarding fellowships, NWO assumes that the recipients will return to the Netherlands at the end of the agreed period.

The Selection Committee members receive all proposals together with the recommendation letters and reviews two weeks before the meeting. In a meeting they make a priority list based on the above mentioned documents. The projects are granted in order of ranking at the priority list. The budgets are not cut. Around 50 % of the proposals is funded. Candidates are sent written notifications of the outcome within a month of the Committee's decision, but a list of awards is published - the day after the meeting on the NWO website. In case the applicant does not get the scholarship, a summary of the reasons for rejection is given in this letter.

The recipient of the fellowship must send NWO a brief report of his/her activities every 4 months. Within 3 months of the end of the fellowship period, NWO will expect to receive a final academic report of the research undertaken and the results achieved over the entire period of the fellowship. Publications arising from the TALENT scholarship have to be sent to NWO. Also a financial report with documentary evidence (tickets, contract for renting a room etc.) is required. An additional report containing practical information which may be of use to future recipients would also be appreciated. Researchers are not given any form or instructions to prepare the scientific report. NWO administrators check if the scientific final reports fulfil the requirements.

Investment subsidy: as an example the CW (Chemical Sciences) Medium Investments subsidy

Medium Investments subsidy is a grant for scientific apparatus costing between 110 000 euros and 900 000 euros (VAT included). A minimum contribution of the host institute of 25% is required. The total investment subsidy is paid out all at once. No personnel costs etc. can be funded. Funding can be granted to permanent staff of Dutch universities and NWO institutes.

Call for proposals is announced via the website and a mailing to researchers within the field. There is a call once a year, with a deadline in the first week of September. It takes about 5 months from application to decision. The application form includes basic details, requested support, a summary, participating group members, top 5 scientific publications, research proposal, investment plan, budget and exploitation. Instructions are on the NWO website and a brochure. Applications are required in English.

The reviewers are chosen by the administrators. Applicant cannot propose reviewers. Reviewers should be more experienced than the applicant (at least associate professor or professor) and experts in the field. 50% of the reviewers are international. Evaluation Criteria are scientific quality, societal interest, national interest, financial and technical criteria. Reviewers receive a letter, a special referee form and the proposal. 3-4 evaluations are given for one proposal. The applicants have the opportunity to write a rebuttal letter as response to the comments of the reviewers.

The Board of the Council of Chemical Sciences put together an Investment Committee. The Investment Committee makes a priority list based on the proposals, the reviews and the rebuttal letters and possibly interviews. In one committee approximately 15 proposals are processed by 10 members.

The Board of the Council for Chemical Sciences decides of funding. The projects are granted according to the priority list of the Investment Committee. If the project is funded, the budget is not cut. Around 20 % of the applications are funded, but it strongly depends on the subsidy that is applied for in every project. The Council of Chemical Sciences has a budget of 900 000 euros for the CW Medium investment subsidy each year. No reports are required during or at the end of the project.

Legal and administrative considerations

Granting of funding abroad. In the Netherlands there is no legislation concerning granting research funding to foreign institutes or persons within the Netherlands nor to institutes or persons abroad.

There are several institutes where foreigners can request funding for studying or doing research in the Netherlands (e.g. ISS Institute for Social Studies). There are also exchange programmes via the Max Planck Institute. In addition, with certain countries agreements are made to make it easier for foreigners to do research in the Netherlands.

In broad terms researchers with tenure at Dutch universities and research institutes recognised by NWO may apply. For certain programmes a wider - or narrower - range of persons is allowed to apply. Details are provided under the various subsidy programmes. However, the common practice is that it is not possible to grant funding to foreign institute abroad. The money follows co-operation line scheme is not applied at the moment.

Conflict of interest. In the Netherlands no specific legislation concerning conflict of interest exists. However, in certain laws conflict of interest is dealt with.

NWO has prepared a document in which the guidelines concerning conflict of interest are explained. In this document it is said that the conflict of interest is a problem when a person who is involved in judging or decision making applies for a grant him or herself; is a co-applier; is a supervisor, project leader etc of this project; cooperates in the project in another way; has written a support letter for the project; has supervised the applicant in the past and or has published together with the applicant in the past (within the last 5 years); is family of the applicant in the 1st, 2nd or 3rd degree; is the partner of the applicant.

Persons that are employed by NWO are not allowed to be part of any of the Boards of NWO. Moreover, NWO personnel cannot submit a proposal for the Research Council that they are working for. Members of a programme committee have to leave the meeting when a voting is taking place on a project he proposed himself.

The office administrator ensures if the reviewers or the members of the review panel have any conflict of interest with the applicant. The director of each Council ensures that the administrators themselves have no conflict of interest.

Publicity. Publicity of research plans, proposals, evaluations, application processing are not regulated by the law in the Netherlands. However, NWO has its own regulations for the publicity of research plans, proposals, evaluations etc. The NWO rules concerning publicity are communicated as a clause in IRIS (electronic submission program), in the subsidy guide and in the Call for Proposals or brochure of a specific programme. The research plans, proposals and evaluations are confidential. Reviewers are reminded about the confidentiality of the research plan in the reviewer's instructions. Sometimes the abstracts of the proposals are put on the website, but only if the applicants have no objection.

Intellectual property rights. Legislation concerning intellectual property rights is established in several laws in the Netherlands e.g. Dutch Patent Act 1995, the authors law, EU-legislation and certain international agreements. These regulations are mentioned in the subsidy guides of the

specific programme and on the NWO website. Usually the intellectual property right of the research performed using NWO funding belongs to the university involved. However, for certain programmes (e.g. ACTS and CW/STW) other arrangements are made.

Research ethics and good scientific practices. A special organ (LOWI) exists where people can be charged of scientific misconduct. There is a specific NWO memorandum on scientific misconduct (reference can be found in the NWO subsidy guide). This document explains how and where to make a complaint.

Gender equality and equality of minorities. Several laws exist in the Netherlands dealing with this subject e.g. Committee Equal Treatment, Law to forbid age discrimination at work, Law of equal treatment for men and women and EU-regulations. In advertisements for government personnel it is mandatory to mention that notably non-natives and women are invited to apply.

Special programmes are started to stimulate the gender and minorities equality, e.g. Mozaic (minorities), Aspasia and MEERVOUD (women). Furthermore, in the various subsidy programmes the ratio between men and women and ratio natives-non-natives is registered.

National legislation will not hinder NWO's participation in transnational research programmes.

Obstacles and best practices for transnational research programmes

On a national level NWO has experience with common-pot research programmes e.g. ASPECT and Sustainable Hydrogen (ACTS programmes). On an international level NWO has experience with jointly-funded research programmes e.g. Eurocores and CERC3 programmes. Internationally, NWO participates in a common-pot research programme, viz. EURYI.

Obstacles for jointly funded chemistry research programmes within European countries would be the differences in the evaluation procedure, e.g. the lacking of a rebuttal and differences in the way the projects are financed. In case cooperation with the industry will be part of the programme, problems with the Intellectual Property Rights can be expected. The main obstacles in NWO will strongly depend on the extent the whole process (application, evaluation, etc) will differ from the NWO-procedures.

To overcome the obstacles clear arrangements should be made before the call is presented (e.g. which organisation will finance what). A jointly-funded research programme will be easier to implement than a common-pot programme. Therefore, this is strongly preferred by NWO/CW. The best practices should be discussed at the first ERA-Chemistry evaluation workshop.

OTHER MAJOR FUNDING BODIES IN THE NETHERLANDS

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The Technology Foundation STW is the Dutch funding agency for university research. Tenured university staff can apply for a research grant, provided that their proposal includes utilization: the embedding of the results in society. The STW actively supports utilization by involving market parties in the users committee.

In the Netherlands research funding is organized along disciplinary lines. Each branch of science and humanities has its own department within NWO, the Dutch research council. Within this organization the Technology Foundation STW has a special position. STW research projects can stem from any of these fields, although most grant applications belong to science and technology. Every other section of NWO cooperates with the Technology Foundation as soon as applications come into sight.

STW has no fixed budget for chemistry or for any other scientific discipline. Individual research proposals from all disciplines compete with each other for funding. Their success determines in the end how much is spent in each discipline. STW has a total yearly budget of 46 million euro. In the past STW spent approximately 22% of the budget on chemistry and 13% on Medical Sciences. The latter also includes more medically oriented molecular biology and chemistry.

Main characteristics of funding policy and procedures

The Technology Foundation supports research that meets two criteria: it must have high scientific quality and at the same time it must be directed towards practical application. The mission of STW is to finance applied research. Utilization of research results by others than the own research community is the key word. The involvement of an industrial partner is not per se mandatory but the applicants are asked to make the case that the results of their research will be useful for someone outside their own research community. In general STW sees that in more than 90% of all applications a commercial company is involved. For the remaining 10% the user group consists of other (societal) organisations.

STW follows the bottom-up approach. Of its budget minimally 80% is spent on the 'Open Technology Program' (OTP) which is bottom-up, the remainder is spent in special programmes, mostly joint programmes with other research organisations. These special programmes have often (but not always) a top-down approach.

STW funds individual researchers. Research proposals are selected on the basis of their scientific quality (which includes evaluating the past performance of the applicant) and the prospect of utilization of the research results. Both criteria are given equal weight. Tenured faculty members

from universities can apply for a research grant covering material and investment costs, the cost of temporary personnel and foreign travel. Many STW projects present an opportunity to obtain a PhD to graduate students, but postdocs and technicians are also frequently appointed.

STW proposals are mostly written in English, with a Dutch summary and applicants are free to submit in hard copy or in electronic form. For the OTB program there is no deadline for submission. STW aims at limiting the evaluation time to less than 6 months from submission.

Eligible costs are salaries of additional personnel (PhD, postdoc, technical assistance) plus societal security premiums, consumables, equipment and foreign travel. Approximately 40% of the proposals can be granted.

The Technology Foundation uses a special method to assess project proposals. The procedure was especially developed to compare proposals from the wide range of different subjects and disciplines covered by STW. This includes fields like physics, chemistry, mathematics, microelectronics, mechanical engineering, medical technology, biotechnology and many others. Anything is welcome, as long as utilization is provided for. The outcome of projects is assessed in the yearly utilization report. Each project is evaluated twice. The first time five years after start of the project, the second time ten years after the start.

STW has limited experience with transnational research funding but have co-operated with the DFG (Germany) in the past and with EPSRC (UK).

SenterNovem

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Senter and Novem, both agencies under the Dutch Ministry of Economic Affairs, have recently been merged. The new SenterNovem organisation incorporates knowledge of innovation, energy, climate, the environment and living conditions; thus contributing to a stronger position for Dutch industry, as well as to a sustainable society that cares for people and the environment. The agency is responsible for the execution of grant schemes in the above areas on behalf of a range of Dutch ministries. SenterNovem has a total of EUR 1,3 billion at its disposal. In most cases, proposals are submitted for appraisal to an independent external committee. The members of this committee generally consist of business people who have no link at all with the project proposal or the company making the application. Information on the programmes administered by SenterNovem is available on the website.