



Applied and Engineering Sciences

**'Connecting Innovators'**

## Call for proposals

# Research programme

Novel Antibacterial Compounds and Therapies  
Antagonizing Resistance (NACTAR)

**Guidelines for funding proposals for research under the  
Research programme as determined by NWO Domain TTW and the Ministry  
of Health, Welfare and Sport**

**Information event** (tips/trics/FAQ)

**7 June 2017** (TTW office, Utrecht)

**Deadline for submission of pre-proposals:**

**27 June 2017; 14:00h CE(S)T (Central European  
(Summer)Time)**

**Deadline for submission of full proposals:**

**21 September 2017; 14:00h CE(S)T (Central  
European (Summer)Time)**

**Version: 16 May 2017**

Utrecht,  
Netherlands Organisation for Scientific Research  
NWO Domain Applied and Engineering Sciences



Ministry of Health, Welfare and Sport

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# Summary

The Dutch Ministry of Health, Welfare and Sport and NWO Domain TTW have jointly commissioned an ambitious research programme on the development of new antibiotics and alternatives to antibiotics. As a result, we present here the Call for Proposals focusing on 'Novel Antibacterial Compounds and Therapies Antagonizing Resistance' (NACTAR). The main goal of the programme is to facilitate research and development of new antimicrobial molecules and alternatives to antibiotics, which should become available for the healthcare system for a fair and affordable price.

Antimicrobial resistance (AMR) is one of the major threats to human health in the 21st century, with some bacterial pathogens acquiring resistance to all clinically available antibiotics. Worldwide, infections caused by multi-drug resistant (MDR) bacteria are now a major cause of morbidity and mortality, and have markedly increased healthcare costs. Consequently, **the aim of this program** is to discover, develop and exploit new resources for antibiotics and alternatives to antibiotics and to provide a trajectory for their clinical development. The NACTAR program connects to the National Antibiotic Development Platform (NADP), which was established by NCOH, CARES, CeSAM and Immunovalley with support of the Dutch Ministry of Health, Welfare and Sport (VWS) with the aim of supporting the development of drugs to counter AMR.

The aim of the NACTAR program is to deliver new bioactive compounds and alternatives to antibiotics aimed at curing human infectious diseases caused by MDR bacteria. This includes the use of microbial hosts and methodologies to synthesize new bioactive compounds and semi-synthetic variants, characterization of their antimicrobial activity and their efficacy in infectious disease animal models. We foresee many potential patent applications, and opportunities for small-to-medium enterprises to interact with academia.

Project proposals should adhere to the full programme guidelines as defined in this document below. In summary:

- Proposals should address (one of the) topics as described in 'Objective of the Programme',
- The application procedure consists of a pre-proposal and full proposal phase,
- The pre-proposal will be used only to assess whether the proposed research fits within (one of the) topics as described in 'Objective of the Programme',
- Scientists employed by Dutch (Technical) Universities and institutes eligible for funding by NWO can submit a proposal (see 'Guide for applicants'),
- The maximum funding to be requested is 750,000 euro (inclusive of Dutch VAT),
- Proposals require the participation of at least 4 users, 50% of the users should be relevant industrial partners in view of the utilization,
- Requirements for co-funding (section 'Specific requirements to the programme', to be specified in full proposal): at least 15% of the total project budget (in cash and in kind), including an in cash entry fee per industrial project partner (5000 euro or 10.000 euro depending on company size),
- Before submission applicants choose the NWO Domain TTW IP-policy their project will adhere to (see Appendix 4 'IP arrangements'),
- Apart from the programme-specific guidelines defined in this document, the 'General Conditions' as published together with this call, will apply.

We recommend all applicants to consult the full programme guidelines, including the guide for applicants, before considering the preparation of a (pre)proposal, and to contact the TTW office well ahead of the submission deadline with any questions.

# Introduction

This brochure details the conditions governing proposals submitted to NWO Domain TTW for the funding of scientific research under the Research programme 'Novel Antibacterial Compounds and Therapies Antagonizing Resistance' (NACTAR) issued by NWO Domain TTW and the Dutch Ministry of Health, Welfare and Sport. Links to relevant websites can be found below in this document.

Before submitting your application electronically via ISAAC, NWO Domain TTW recommends that you visit its website ([www.ttw.nwo.nl](http://www.ttw.nwo.nl)) to verify that you have the latest version of this brochure, and that you read the **full guidelines** carefully. Moreover, please familiarize yourself with **ISAAC** ([www.isaac.nwo.nl](http://www.isaac.nwo.nl)) before you start the submission of your proposal.

## Partners of this Research Programme

Several partners are involved in this research programme. The Dutch Ministry of Health, Welfare and Sport together with the NWO Domain for Applied and Engineering Sciences (NWO Domain TTW) have issued this Call for research proposals. Part of the available budget has been allocated for the Topsector Chemistry, which is represented by the NWO Domain Science in this programme.

Finally, the Netherlands Antibiotic Development Platform (NADP) is involved as an important partner in facilitating the application of project results by relevant private parties.

NWO Domain TTW will handle the application process and assessment procedure, and as such the General Conditions as published with this Call for proposals apply, unless Programme-specific conditions, as specified in this Brochure, are applicable.

### Ministry of Health, Welfare and Sport

The mission of the Dutch Ministry of Health, Welfare and Sport (Dutch: Ministerie van Volksgezondheid, Welzijn en Sport (VWS)) is to ensure a healthy life for all Dutch citizens. One of the main areas of interest for the Ministry in the past years has been the development of antimicrobial resistance of bacterial pathogens to antibiotics, which has resulted in various policy measures as well as a research programme on antimicrobial resistance carried out by the Netherlands Organisation for Health Research and Development (ZonMW). However, it is vital that also new antibiotics, or alternatives to antibiotics, are developed. The government has launched a national research agenda (NL: Nationale Wetenschaps Agenda) to promote research collaborations between universities, drug companies and university hospitals. The research programme described in this Brochure is a direct result of that agenda, as it is intended to stimulate research into new antibiotics and non-antibiotic approaches. New antibiotics need to be developed, which doctors will be able to use when existing drugs no longer work. Non-antibiotic treatments can also reduce our dependence on antibiotics. With this research programme, the Ministry encourages scientists together with companies to develop new drugs and treatments for bacterial infections.

### NWO Domain TTW

NWO Domain TTW is part of the Netherlands Organisation for Scientific Research (NWO; [www.nwo.nl](http://www.nwo.nl)) which supports a strong system of sciences in the Netherlands by encouraging quality and innovation in science. Responsibility for the national science and innovation policy lies with the Ministries of Education, Culture and Science (OCW) and Economic Affairs (EZ). As such, NWO Domain TTW provides indirect government funding.

### Mission

NWO Domain TTW connects people and resources to develop technology with economic value that contributes to societal challenges.

NWO Domain TTW does so by:

- bringing scientific researchers and potential users together;
- funding excellent research in the applied and technical sciences.

## **Utilisation**

Research funded by NWO Domain TTW generates valuable knowledge. In addition to excellent science, NWO Domain TTW aims to promote the application of knowledge. The term used by NWO Domain TTW to refer to the set of activities aimed at maximising the possibility of research results being applied by third parties is 'utilisation'. In order to promote utilisation in addition to scientific quality, NWO Domain TTW establishes a user committee for every project. NWO Domain TTW expects applicants and users to actively collaborate towards promoting utilisation and towards NWO Domain TTW's objective of transferring knowledge to users. Users, user committees and intellectual property play a crucial role in utilisation.

## **Users**

Users of research are defined as natural persons or legal persons (at national or inter-national level) who are able to apply the results of the research. A distinction is sometimes drawn between direct users, usually companies, and end users. In that case, it is not sufficient to designate end users only. It is NWO Domain TTW's explicit intention that potential technology users and end users outside the immediate circle and outside the research field of the researchers submitting the proposal should be involved in the project from beginning to end. Users should be able to apply the knowledge generated by the research in the medium to long term. (Potential) users should be indicated in the utilisation section of the research proposal.

## **Topsector Chemistry**

This research programme is part of the NWO contribution to the Topsector proposition in the Netherlands, in particular the Topsector Chemistry. Topsectors are areas where Dutch knowledge institutes together with industrial research and development excel, for instance in Chemistry, but also Life Sciences & Health and AgriFood . The main goal of the Topsector Chemistry is to create solutions for the major societal challenges of today. This goal is in a large part inspired by the 'Grand Societal Challenges' described in the ambitious Horizon2020 programme of the European Committee. The Topsector Chemistry addresses five out of seven of these challenges: health, food, energy, transport, climate & raw materials. The Knowledge and Innovation Agenda 2016-2019 (in Dutch: Kennis- en Innovatieagenda (KIA) 2016-2019) describes the ambitions of the Topsector Chemistry in the period 2016-2019, including the Roadmap Chemistry of Life. Since these challenges need to be addressed from multiple disciplines, there is a strong connection to other Topsectors in the Netherlands. The questions raised in this research programme require a similar multidisciplinary approach.

## **Netherlands Antibiotic Development Program (NADP)**

The Netherlands Antibiotic Development Platform (NADP) facilitates the collaboration between public and private organisations, to enhance the development of new antibiotics and alternatives to antibiotics for infectious diseases in humans and animals. NADP will identify relevant research groups, institutes and companies involved in chemical, biological, and/or biomedical antibiotic research to forge collaborations through targeted connections and will organise regular meetings with interested parties.

The NADP will be involved in this research programme in particular in helping to ensure participation from industry (big pharma, SMEs and/or start-ups) which are essential partners in bringing new antimicrobial molecules and alternatives to antibiotics to use.

# Background

Ever since the first use of antibiotics to treat infectious diseases, bacteria have developed resistance to these medically crucial compounds. Accelerated by the overuse of antibiotics in the 20<sup>th</sup> century, multidrug resistant (MDR) bacteria have emerged in all parts of the world. Well-known examples include pathogens of the so-called ESKAPE group, namely VRE (vancomycin-resistant *Enterococcus*), MRSA (methicillin-resistant *Staphylococcus aureus*) and MDR *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa* and *Escherichia coli*, as well as others including *Clostridium difficile* and MDR-*Mycobacterium tuberculosis* and XDR- *M. tuberculosis* (multiple and extremely drug-resistant forms of the tuberculosis pathogen, respectively). Infections by these drug-resistant bacteria pose an enormous threat to human health and lead to markedly increased health care costs. Many pharma and biotech companies have withdrawn from the field of antibiotic development and now focus on non-communicable disease targets. This reflects a relatively poor return on investment for antibiotic discovery and development, and the difficulty in finding novel natural product candidates for clinical development using traditional methods (the majority of currently clinically used antibiotics are derived from natural sources). This has resulted in the so-called discovery void and a paucity of new drugs and alternative treatments for bacterial infections that has lasted for over two decades. We therefore need a paradigm shift in which academia and industry collaborate to develop new approaches to counter antimicrobial resistance (AMR). This will include exploiting new insights into and knowledge of the biology of antibiotic producing organisms, the mining of genome and metagenome information, synthetic chemistry, pharmacology and mode of action.

## New antibacterial molecules

How can we discover the novel molecules that will ensure that we can keep developing new antibacterial therapies? Thus far only a small portion of the antibiotic diversity in nature has been harnessed, perhaps as low as 1-3% of chemical space. An important breakthrough came at the start of this century with the revelation that the genomes of bacteria of the order *Actinomycetales* (and in particular *Streptomyces*), and of many other (marine and terrestrial) bacteria and of filamentous fungi, harbour far more biosynthetic gene clusters for natural products than previously believed. Indeed, these organisms contain dozens of biosynthetic gene clusters with high genetic diversity that must encode for thus far uncharacterized biologically native natural products, many with potentially potent antibacterial activity. Many of these so-called *cryptic* or *'sleeping'* gene clusters are either not expressed or only at low levels under typical laboratory conditions, most likely requiring signals derived from the natural ecosystem where the bacteria originate from for their activation. Gene clusters may be expressed heterologously in optimized hosts and - making use of innovative technologies such as CRISPR/CAS and synthetic biology - the compounds they specify can be produced in a tractable production host which is important for scale-up and for genetic modification. Furthermore, only a very small proportion of microbes present in the environment (perhaps as low as 1%) have been cultivated in the laboratory, and approaches that promote growth of such *"uncultivable"* bacteria have led to the discovery of novel molecules, with Teixobactin as recent example. Harnessing this yet unexplored genetic and biological biodiversity is one of the most promising approaches for antibacterial drug discovery and a major focus within NACTAR. In addition to seeking new drugs that target bacteria themselves, compounds that counteract resistance are also of interest. For example, resistance to penicillin and other  $\beta$ -lactam antibiotics such as the cephalosporins is governed by the activity of enzymes called  $\beta$ -lactamases, and their activity is inhibited by clavulanic acid, which is a mimic of penicillin. Amoxicillin in combination with clavulanic acid (marketed as Augmentin®) is still one of the most effective therapies against bacterial infectious diseases.

*Synthetic biology* and *combinatorial chemistry* are key supporting technologies that allow scientists to further unlock the full potential of antibacterial compounds and for lead optimization. This varies from chemical derivatization of known drugs to circumvent resistance, such as for the large family of penicillins, cephalosporins and aminoglycosides, to the development of entirely new classes of drugs by combinatorial chemistry. For example, non-ribosomal peptide synthases (NRPS) are modular enzymes, where the Domains specify the catalytic steps and therefore determine which NRP is formed. By shuffling the Domains, it is possible to create entirely new NRP's that can then be screened for antimicrobial properties. Also ribosomally synthesized and posttranslationally modified peptides form a rich source as scaffolds for engineering and synthetic biology to obtain new and improved activities against major pathogens and can yield novel classes of potent anti-infectives.

## Alternatives to antibiotics

It is becoming increasingly clear that host immune mechanisms are involved in the curative response to antibiotic treatment of chronic bacterial infections. For example, at the end of a full course of TB treatment active (PET/CT) lesions and microbial RNA as well as DNA are still present in the treated patient, without later relapse of disease, strongly suggesting that the host response is key in preventing disease reactivation following chemotherapy. Boosting host immunity in principle can be achieved in two different ways: one is the use of therapeutic vaccination with post infection vaccines to boost host immune responses to clear, or to accelerate clearance of the bacterial infection. As a corollary such vaccines might also have value in shortening treatment with antibiotics, which will help preventing emergence of new antibiotic resistant bacterial strains. A second avenue is to improve host immunity by manipulating host immune checkpoints in a similar way to much current cancer immunotherapy. Host directed therapy with compounds and drugs that facilitate killing of bacteria in the host environment such as inside human cells in the case of intracellular infections (e.g. mycobacteria, salmonellae, listeria, etc.), would be of significance in accelerating and improving treatment outcomes in chronic bacterial infectious diseases. It is anticipated that both therapeutic/post-infection vaccination as well as host directed therapy are not limited by antibiotic resistance since they act through mechanisms other than bacterial resistance pathways. In addition, new strategies to compromise the bacteria's ability to escape immune surveillance and induce immune suppression can be explored, employing methods to boost the host immune response, e.g. as a combination therapy.

Synthetic compounds and peptides that act on alternative pathways and targets as compared to conventional antibiotics will also be considered, with novel or combination therapies representing strategies to counter antibiotic resistance.

## Building of a national infrastructure on antibacterial research

In recent years, the (now former) Minister of Health Edith Schippers made a strong case for new efforts to fight AMR. This became a major focus when the Dutch government was chairing the EU in the first half of 2016. Within the Netherlands many academic institutions and their hospitals have set up collaborative networks such as the Centre for Antimicrobial Research (CARES), the Centre for Sustainable Antimicrobials (CeSAM) and the Netherlands Centre for One Health (NCOH). The newly established National Antibiotic Development Platform (NADP, part of the NCOH) will be involved in this programme in particular in helping to ensure participation from industry (big pharma, SMEs and/or start-ups) which are essential partners in bringing new antimicrobial molecules and alternatives to antibiotics to use. In addition, despite the focus on national research initiatives described above, this programme is explicitly intended to be complementary to ongoing European and international efforts on research into antimicrobials and antimicrobial resistance (e.g. FP7, Horizon2020, JPI AMR, IMI).

The collaborations described here are crucial in bringing together the necessary expertise's to successfully develop new solutions to AMR. In 2009, the 'Perspectief' program *Genbiotics* was initiated, which was funded by the Netherlands Technology Foundation STW (now NWO Domain TTW). This program, which ended in 2014, not only resulted in important scientific discoveries and technologies, but also helped establishing a strong network between scientists in The Netherlands. Thus, the now completed *Genbiotics* program serves as a template for Public-Private Partnerships (PPP) focused on drug-discovery approaches to tackle AMR, and for NACTAR in particular.

# Objective of the programme

## Objectives and application of results

The program seeks to generate concrete chemical and biological solutions that can enter lead development programs within the 5 year period set for the Programme. Although the parties financing the Programme realise that this time-frame is highly ambitious in the field of drug-development, it indicates the sense of urgency and a need for scientifically excellent research with a specific focus on application of results. Examples include applications to exploit the potential of the sequenced genomes and biodiversity of actinomycetes, filamentous fungi and other microbes known to produce clinically relevant antibacterial drugs; retrieving microbial strains from underexplored environments and screening new microbial taxa; (bio-)synthetic combinatorial approaches to increase structural diversity of existing and newly identified antibiotics; development of antibodies for the development of novel immunotherapies; development and testing of novel host-directed approaches to complement current treatments. The preferred target organisms are those recently highlighted by the WHO as serious threats to human health, specifically the ESKAPE pathogens VRE, MRSA, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa* and *Escherichia coli*, and in addition *Streptococcus pneumoniae* and *Clostridium difficile*. In addition, treatments that counteract biofilm formation, persistence and other antibacterial resistance mechanisms will also be considered.

## Scope of the programme

The program will focus on the following themes:

1. Harnessing biodiversity and genome information for lead discovery
2. Combinatorial approaches for lead derivatization
3. Development of alternative antibacterial treatments

Applications are invited that aim to deliver lead compounds within the five year time-frame of the program. Putative drugs should target bacterial pathogens and preferentially the most problematic MDR pathogens. ([www.who.int/mediacentre/news/releases/2017/bacteria-antibiotics-needed/en/](http://www.who.int/mediacentre/news/releases/2017/bacteria-antibiotics-needed/en/)). Other pathogens considered will include *C. difficile* and *S. pneumoniae*. *M. tuberculosis* is targeted by extensive research programs worldwide (e.g. the StopTB initiative) and only research aimed specifically at delivering lead compounds to combat this organism, or alternative innovative approaches not considered by current global research programs, will be considered.

Proposals should be innovative, and go beyond current approaches. An example of the latter is high-throughput screening by the pharmaceutical industry, which falls outside the remit of this program. Approaches to discover both narrow and broad spectrum antibiotics will be considered, but targeting AMR will be a major criterion.

## Major research areas & Scientific challenges per area

### *Harnessing biodiversity and genomics for antibiotics discovery*

This theme will focus on underexplored collections of microorganisms, innovative approaches to activate the expression of cryptic gene clusters and/or (meta-)genome information. Strains are primarily interesting if they have proven potential to produce bioactive molecules active against MDR bacteria or screened with novel technologies such as elicitors of cryptic gene clusters that have not likely been tried before. This includes chemical ecology, such as microbial interactions, co-cultivations and host-pathogen interactions. Harnessing genome or metagenome information is particularly useful if researchers can make a strong case that the clusters likely specify antibiotics with novel bioactivity. Bioinformatics and genomics are supporting technologies to efficiently mine such data and prioritize the most interesting gene clusters. The scientific challenge is to unravel which gene clusters specify antibacterial compounds. A second challenge is to produce these compounds in an efficient manner.

### *Combinatorial approaches for antibiotic development*

This theme will focus on chemical and enzymatic modification of core structures, including those derived from the approaches mentioned in the previous section. New functionalities for known antibiotics might be

part of the program only when there is a clear demonstration of the potential to generate novel bioactivity or to avoid resistance. Combinatorial strategies may include, for example, feeding experiments with chemically modified precursors, and chemical or enzymatic derivatization to generate hit and lead compounds. Biosynthetic combinatorial methods may also be considered that are focused on the generation of libraries of modified antibiotics.

#### *Lead optimization*

Natural products may be hampered by metabolic reactions, poor solubility or membrane permeability as well as by toxicity issues. These issues can be tackled by chemical and enzymatic modification or by (semi)-synthesis. Efficient methods have been developed to modify and decorate natural products based on the scaffold structure. We anticipate synthetic combinatorial schemes to optimize potential antibiotics. Using the core structure of the compound with antibiotic activity, combinatorial chemistry should lead to structures with different and more favourable chemical properties, for example reduced toxicity or propensity for resistance development. Chemical preparation of analogs should aid the elucidation of structure-activity relationships and the identification of the core scaffold for antibacterial activity. Scale-up of the synthesis will be important as soon as further testing of the compound is required.

#### *Development of alternative antibacterial therapies*

Boosting host immune mechanisms to enhance the curative response to antibiotic treatment by immunopotentiators can improve treatment outcome, prevent disease reactivation and also help to shorten treatment with antibiotics, thus increasing compliance with good medical practice and reducing the likelihood of the emergence of new antibiotic-resistant bacterial pathogens. Improving host immunity is main stream in cancer immunotherapy. Host-directed therapy with compounds and drugs that facilitate killing of bacteria in the host environment such as inside human cells in the case of intracellular infections (*Mycobacteria*, *Salmonellae*, *Listeria*, etc), would be of significance in accelerating and improving treatment outcomes in chronic bacterial infectious diseases. In addition to improving the potency of the host immune system, new ways to compromise immune suppression by pathogenic bacteria can be explored. Also novel molecules in the chemical space, including sugars and anti-microbial peptides provide candidate alternatives to be explored. Novel combination therapies represent new strategies to counter antibiotic resistance. Novel approaches such as those using bacteriophages may be included, provided they adhere to the ambitions of the program. Importantly, 'alternative therapies' as in 'alternative medicine', molecules/compounds derived from protected/endangered sources etc. are outside of the scope of this research programme.

For a detailed list of topics that are welcomed within this call we refer to **Appendix 8**.

Topics that are **not considered** within this call for proposals are:

- Proposals with the **sole** aim of:
  - development or improvement of vaccines
  - development or improvement of diagnostic tools
  - development or improvement of enabling technologies
  - development of phage therapy in general (as opposed to: developing a specific phage therapy directed at a specific (type of) infection)
  - fundamental research on vital biological processes in bacteria which may in time identify potential drug targets (e.g. cell division, membrane transporters, protein biosynthesis etc.)
  - identification of potential drug targets without lead compound development, e.g. by library screening for potential drug targets
  - (fundamental) research on 'mode of action' of a potential therapy or drug molecule
- Proposals focusing on:
  - antibiotic resistance (AMR) in the sense of monitoring and/or regulation
  - surveillance of antibiotic use
  - organisms other than bacteria (i.e. fungi, parasites, viruses, insects, crops/plants, pests)
  - development of biocides and disinfectants
  - development of conventional immunomodulatory compounds
  - crop protection
  - veterinary use alone
- 'alternative therapies' as in non-conventional 'alternative medicine', molecules/compounds derived from protected/endangered sources, homeopathy, herbal medicine, complex often undefined mixtures of natural products etc.
- Clinical trials

We urge you to contact the NWO Domain TTW Programme office well ahead of the deadline for submission should you have questions concerning the fit of your project idea in the scope of the Programme.

## **Programme budget**

Together NWO Domain TTW and Ministry of Health, Welfare and Sport have made a total budget of 6.85 million euro (inclusive of Dutch VAT) available for this Research programme.

Out of the total Programme budget 6.85 M€, VWS will contribute 3,85 M€ to the research programme. NWO Domain TTW will contribute 2 M€, of which 1 M€ is 'earmarked' for the Dutch Topsector Chemistry (represented by NWO Domain Science). This budget includes a reservation for bureau costs and programme activities with a maximum 5% of the total programme budget (inclusive of Dutch VAT) leaving 5.5 M€ euro for research projects within this call. In addition, co-funding from participating private parties will be required at the project level (section 'Specific requirements to the programme').

VWS has reserved 1 M€ of programme budget for the for clinical testing of promising novel antibiotics or alternatives that result from the research programme. During the course of the research programme the Programme Committee together with NADP and NWO Domain TTW and VWS will decide on how to apply this most effectively.

Both the available budget and the timelines agreed between VWS and NWO will allow for one (1) Call for research proposals. The programme has a maximum duration of five (5) years starting from the award date of the project grants within the programme.

## **Project budget**

The maximum funding that can be requested per project is 750,000 euro (inclusive of Dutch VAT). Please note the requirements for co-funding (section 'Specific requirements to the programme'). The typical project duration ranges from 2 up to 4 years, starting from the award date of the project grants. Duration of individual projects may not extend over the Programme end date.

## **Valorisation**

The main goal of this research programme is to achieve application of project results, preferably during or shortly after the duration of the programme. Therefore, the Dutch Ministry for Health has reserved 1M euro to be allocated to projects that are aimed at taking a promising result into clinical trials. Details on how this budget will be spent, will be published at a later date. The NADP will play an important role in the distribution of these funds.

## **Funding conditions and Intellectual property (IP) policy**

This call is published by NWO Domain TTW and, therefore, the 'General Conditions' as published together with this call are applicable to this programme. Management and administration of project (proposals) is done according to procedures of NWO Domain TTW

As stated this research Programme focusses on development of new antimicrobial molecules and alternatives to antibiotics which should become available and accessible to the healthcare system for a fair and affordable price. Therefore the elements "availability" and "fair and affordable price" have to be part of any IP arrangements related to projects under the programme.

Please find a detailed explanation of the IP & publication guidelines further in the section "Notes on Intellectual Property policy (IP policy) & Publication" and Appendix 4.

# Specific requirements to the programme

## Who can apply

Scientists employed by Dutch (Technical) Universities and institutes eligible for funding by NWO Domain TTW (see 'Guide for applicants' below) can submit a proposal to this call.

The ambition of this research programme is best served by multidisciplinary research teams, and we invite consortia consisting of at least two different academic partners to apply, in collaboration with relevant industrial partners. Main applicants should have a track record in the field of antibiotic discovery or alternatives to antibiotics.

## Criteria for submission

The proposals must meet the following criteria:

- Proposals must fit within the themes of the programme as described in this brochure. 'Fit into the Programme' is the main requirement to be assessed by the Assessment Committee,
- Proposals should be a collaborative effort of at least two (2) independent research institutes that are both eligible for NWO funding.
- Proposals that fit into the programme should be multidisciplinary as reflected by the different background of the (research) partners involved in the consortium.
- Utilization of project results should be in the perspective of development of new antibiotics and/or therapies against resistance.
- Proposals should clearly describe how the consortium will be managed, with particular emphasis on how to achieve the application of results.

**NOT** able to be part of this research programme are projects focussing on the themes listed above as 'out of scope' in the section 'Objectives of the Programme'. See also 'Fit in the Programme'.

## Co-funding criteria

For each project cofunding from users is required. At least 15% of the total project costs (required financial resources plus in-kind contributions) must consist of co-financing from users. Of note, co-funding may never be more than 49% of the total project cost.

Moreover, a minimal cash contribution from each industrial partner (company) for each project is required, a so-called 'entry fee'. The height of this entry fee is determined by the company size:

- 5000 euro for start-up's / SME (as defined by European Commission, see test: <http://fit.uwe.be>)
- 10.000 euros for large(re) companies

Co-funding is calculated as the added total contribution from all users consisting of financial (in cash) and in-kind contributions. Calculation examples for the requirement co-financing can be found in Appendix 2. In kind contributions are relevant capitalised personnel and/or material contributions from users (see below). The level of co-funding (in cash and in kind) as well as the nature and relevance of co-funding (in kind) will be subject to assessment by both the external referees and the Assessment Committee.

Commitment of users should be confirmed in letters of support (see 'notes on cofunding'). Relevant industrial partners aim to contribute to the goal of the programme, i.e. development of new antibacterial molecules and/or alternatives to antibiotics, as opposed to developing for instance 'enabling technologies'.

## Fit in the programme

Only those research proposals that fit into the scope of the programme as described in the section 'Objectives of the programme' and detailed in Appendix 8 may be submitted. This requirement will be enforced by the Assessment Committee (see 'Assessment Procedure').

## **Multi disciplinarity**

At least two (2) researchers who are employed by at least two (2) different universities or public research institutes that are eligible for NWO funding submit a joint research proposal. The TTW office considers the main applicant to be the project leader and the contact person throughout the procedure.

## **Involvement in multiple projects**

Within this programme, a researcher may associate his/her name to one (1) research proposal as main applicant and to one (1) research proposal as co-applicant.

## **Duration of the research programme**

The programme has a maximum duration of five (5) years. Individual projects will have a typical duration of 2-4 years, however activities in the projects may not extend beyond the end date of the Programme.

## **Programme committee**

A Programme committee consisting of nine (9) international experts from the field has been installed to determine the outline of this research programme. Members of the Programme committee are not excluded from participating in the Programme as (co)applicant or user. However, Programme committee members who are involved in any capacity with the submission of a research proposal in this Programme, either as (co)applicant, user, or advisor to a consortium, are excluded from having a role in the Assessment Procedure (see below).

After the selection and granting procedure, the Programme committee will be responsible for the overall directions and management of the programme and stimulates the collaboration between the granted projects (where applicable), as well as the connection to ongoing applied research programmes and projects.

All members of the Programme committee are subject to confidentiality restrictions to protect any results of ideas laid down in the project proposals and discussed during meetings. Programme committee meetings will be organised at least once a year unless the Programme committee decides differently based on particular needs.

## **Resubmitting research proposals**

Research proposals that were rejected in a previous STW or NWO Domain TTW evaluation procedure cannot be resubmitted automatically. When a research proposal is resubmitted, the scientific description (Section 4 of the application form) and/or the utilisation plan (Section 5 of the application form) must have been significantly revised. NWO Domain TTW will be the judge of this. The earlier referees' comments may be used as a guideline in revising the proposal. When submitting the research proposal, the applicant is obligated to attach a statement in English explaining the revisions. If the research proposal has not been revised sufficiently, it will not be considered.

## **Submission of project idea for funding elsewhere**

If identical or very similar research proposals are or will be submitted to NWO or other funding bodies, this must be stated in the proposal. For the duration of the assessment procedure of this research programme call, the submission of identical or very similar proposals (this judgement of NWO Domain TTW) to more than one of the following calls is not permitted: Open Technology Programme and 'Perspectief' Programme.

## **Open Access**

All scientific publications resulting from research that is funded by grants derived from this call for proposals and approved by the user committee are to be immediately (at the time of publication) freely accessible worldwide (Open Access). There are several ways for researchers to publish Open Access. A detailed explanation regarding Open Access can be found on <http://www.nwo.nl/openscience-en>.

## **Data management**

Responsible data management is part of good research. NWO wants research data that emerge from publicly funded research to become freely and sustainably available, as much as possible, for reuse by other researchers. Furthermore NWO wants to raise awareness among researchers about the importance of responsible data management. Proposals should therefore satisfy the data management protocol of NWO. This protocol consists of two steps:

### *1. Data management section*

The data management section is part of the research proposal. Researchers should answer four questions about data management within their intended research project. Therefore before the research starts the researcher will be asked to think about how the data collected must be ordered and categorised so that it can be made freely available. Measures will often need to be taken during the production and analysis of the data to make their later storage and dissemination possible. Researchers can state which research data they consider to be relevant for storage and reuse.

### *2. Data management plan*

After a proposal has been awarded funding the researcher should elaborate the data management section into a data management plan. The plan should be submitted to NWO via ISAAC within a maximum of 4 months after the proposal has been awarded funding. NWO Domain TTW will approve the plan as quickly as possible. Approval of the data management plan by NWO Domain TTW is a condition for disbursement of the funding. The plan can be adjusted during the research.

Further information about the data management protocol of NWO can be found at <http://www.nwo.nl/datamanagement..>

## **Nagoya Protocol**

The Nagoya Protocol became effective on 12 October 2014 and ensures an honest and reasonable distribution of benefits emerging from the use of genetic resources (Access and Benefit Sharing; ABS). Researchers who make use of genetic sources from the Netherlands or abroad for their research should familiarise themselves with the Nagoya Protocol (<http://www.absfocalpoint.nl>). NWO assumes that researchers will take all necessary actions with respect to the Nagoya Protocol.

# Deadlines and Time frame

Before submitting your application electronically via ISAAC, NWO Domain TTW recommends that you visit its website (<http://www.ttw.nwo.nl>) to verify that you have the latest version of this brochure, and that you read the guidelines carefully.

NWO Domain TTW adheres the NWO policy for deadlines. Your submission receives time and date of registration. Please be aware that submissions registrations of 14.01 CE(S)T on the day of deadline or later will not be considered. For this reason we recommend to familiarize oneself with ISAAC ([www.isaac.nwo.nl](http://www.isaac.nwo.nl)) in advance of the deadline and before you start the submission of your proposal.

## Time frame for pre- and full proposals

| Pre-proposals                                    |                          |
|--|--------------------------|
| NWO Information Event                            | 7 June 2017              |
| <b>Deadline pre-proposals</b>                    | 27 June 2017 14:00h CEST |
| Positive/negative advice by Assessment committee | Early July 2017          |

| Full proposals                          |                                |
|---|--------------------------------|
| <b>Deadline full proposals</b>          | 21 September 2017; 14:00h CEST |
| APPLICANT: Revised version              | End of September 2017 (1 week) |
| Assessment by (international) referees  | September/October 2017         |
| APPLICANT: Rebuttal                     | Early November 2017 (1 week)   |
| Advice programme committee to TTW Board | End of November 2017           |
| <b>Decision by TTW Board</b>            | 8 December 2017                |
| Ultimate project starting date          | 1 July 2018                    |

| Programme Meetings*             |           |
|---------------------------------|-----------|
| First Annual Programme Meeting  | Fall 2018 |
| Second Annual Programme Meeting | Fall 2019 |
| Third Annual Programme Meeting  | Fall 2020 |
| Fourth Annual Programme Meeting | Fall 2021 |
| Final Programme Meeting         | Fall 2022 |

*\*Programme Meetings to be co-organised with the NADP. Dates are indicative, and will be fixed in due time following the awarding of proposals*

# Assessment procedure

The submission and evaluation process for this Call is broken down in two separate, subsequent stages: a call for pre-proposals followed by a call for full proposals. The TTW Board will decide on the funding of the full proposals.

Any (pre-)proposal must be submitted before the submission deadline (see "Deadlines and Timeframe" above, and "Assessment of programme relevance" below) to be considered for funding.

*Please note:* it is the responsibility of the Applicant to ensure timely submission of his/her application to the correct Call. In case of doubt, please contact the contact persons at NWO Domain TTW (see below).

## Assessment of pre-proposals

A pre-proposal consists of the pre-proposal application form and a merged PDF of any already available support letters (*please note that at this stage, submitting of support letters confirming participation and contribution by the intended users is not yet a requirement*).

NWO Domain TTW confirms receipt of the pre-proposal as submitted via email ([t.plantinga@nwo.nl](mailto:t.plantinga@nwo.nl), see 'Guidelines for applicants'). Admission to the next stage of the procedure depends on how well the research topic as described in the pre-proposal fits into the scope and objectives of the research programme. The Assessment Committee determines the 'Fit into the Programme', which is communicated to the applicant in the form of an 'advice' on whether or not to write a full proposal.

As the final decision on whether or not to award the full proposal will be made by the same Assessment Committee, applicants are strongly recommended to adhere to the advice they receive.

In parallel to the assessment of pre-proposals by the Assessment committee, NWO Domain TTW verifies whether the pre-proposal adheres to the formal requirements of the research programme (see section 'Guidelines for applicants'). If relevant conditions are not (yet) fulfilled, the applicant(s) will receive notice with the advice from the Assessment Committee. Applicants are required to incorporate the specified changes within the full proposal (see below).

*Please note that at this stage, only the 'Fit into the Programme' of the proposed research is assessed. The additional criteria as specified in this call text, e.g. users and their contributions, will be subject of assessment at the full proposal stage.*

## Preselection

If at least four times more proposals are submitted than can be funded, NWO Domain TTW retains the right to perform a preselection.

## Formal requirements for full-proposals

**Only proposals that have taken part in the pre-proposal phase, will be accepted at this stage.** A full proposal consists of the full proposal application form and all the required appendices (see 'Guidelines for applicants').

NWO Domain TTW confirms receipt of the research full proposal submitted to ISAAC (see 'Guidelines for applicants'). It then verifies the formal requirements to determine whether the research proposal is eligible for consideration. If the relevant conditions (see section on 'Guidelines for applicants') are not fulfilled or the information requested is incomplete, the research proposal will not be considered. In that case, NWO Domain TTW returns the research proposal to the main applicant within five to ten working days with a request for adjustments or additional information. The main applicant is given 5 workdays (1 week) - calculated from the date of NWO Domain TTW's notification - to submit a revised version (ISAAC). If the information required is not provided, or is incomplete by the deadline, the research proposal is recorded as withdrawn.

## Assessment by referees

NWO Domain TTW submits the research proposal to a number of international experts in the relevant specialist area (peer review). These referees are drawn from the scientific world, large research institutes, and industry. Referees remain anonymous. They assess the proposal on the basis of specific questions about scientific quality, utilisation and 'fit into the programme'. The questions submitted to referees ('Evaluation items', see Appendix 5) are also available on the website (<http://www.ttw.nwo.nl>). NWO Domain TTW recommends that applicants anticipate these questions in the research proposal. The number of referees consulted by NWO Domain TTW depends on the nature of the research proposal and the size of the budget contained in the research proposal. For the purposes of this research programme, NWO Domain TTW aims to have the research proposal assessed by three to five referees.

NWO Domain TTW requests applicants to provide suggestions for referees. To do this, when submitting via ISAAC, please add a list of the names and contact information for a maximum of five **independent** (according to NWO code of conduct on conflicts of interest, see below) **international** referees **with relevant expertise**.

NWO Domain TTW does not use a non-referee list, which allows certain referees to be excluded in advance. However, the applicant(s) may ask NWO Domain TTW to exclude up to two people or organisations from acting as referees. NWO Domain TTW will grant this request **only if** the provision of information from the research proposal to that referee might obstruct the utilisation.

## Applicants' rebuttal

In ISAAC the individual referees' comments are anonymised, if necessary paraphrased and grouped together per question. NWO Domain TTW then requests the main applicant by e-mail to respond **in English** to the referees' comments provided in ISAAC. The main applicant is given 5 workdays (1 week) - calculated from the date of NWO Domain TTW's notification - to submit her/his rebuttal (ISAAC). The available text fields in ISAAC for the response to the comments are not restricted by word limits. The main applicant should respond to each question or each comment raised by the referees individually. Please note that the rebuttal will not be returned to the referee. The combined referees' comments including the responses from the applicant(s) will be used by the assessment committee in arriving at their assessment.

## Assessment committee

To guarantee the objectivity of the assessment as far as possible, NWO Domain TTW puts together an independent multidisciplinary assessment committee which will be responsible for the overall assessment of the research proposals submitted to the programme. The Assessment committee will be composed of approximately 5-9 members (depending on the total number of full proposals to be assessed), all independent national and/or international experts from the field of research relevant for this research programme; universities, large research institutes or industry and other societal sectors. By using this approach, every assessment can take into account the societal needs that science and technology can address in the context of this research programme.

Each committee member assigns three ratings of equal weight - one for scientific quality, one for utilisation (prospects) and one for 'fit into the programme' - to (a sub-set of) the proposals (depending on the number of (pre)proposals that are received). After this individual written round of assessment, the preliminary ranking based on the sum of the calculated averages for all three criteria is determined. During the Assessment committee meeting the priority ranking for the research proposals is determined and an advice to NWO Domain TTW Board is formulated.

Of note, proposals can only be considered for funding if the individual criterions score no more than 4.0, and both the scientific quality criterion and the utilisation quality criterion together score no more than 7.0. Appendix 6 contains an explanation of the meaning of the quality scores.

Provided that a sufficient number of proposals of sufficient quality are received, the aim is to award at least 4 projects under theme 1 'new antibiotics', and at least 2 projects under theme 2 'alternatives to antibiotics'. In the case where no proposals of sufficient quality are submitted to a specific theme, no proposals will be

awarded funding under that specific theme. In the case of remaining budget, for instance due to this lack of proposals of sufficient quality, the Assessment Committee may decide to advise the TTW Board to award additional project proposals of sufficient quality for the other theme. In this case, next to the quality of the proposals, also a fair distribution of budget over the different remaining themes will be taken into account in the advice of the Assessment Committee to the TTW Board.

The data management section in the application is not evaluated and hence not included in the decision about whether or not to award funding. However, both the referees and the committee can issue advice with respect to the data management section.

## **Decision by the NWO Domain TTW Board**

The TTW Board bases its decision on the prioritisation of the research proposals. The priority ranking as established by the Assessment committee is the primary starting point, however the available budget for the research programme and any additional policy considerations may result in deviation from the advice of the Assessment committee. The TTW Board does not assess the scientific content of the research proposals. In practice, unfortunately, the available budget will not be sufficient to fund every proposal of good quality.

The TTW Board may attach additional conditions to the award of funding. These conditions may relate to matters such as intellectual property, co-funding by (potential) users, major investments and/or special infrastructure facilities.

## **NWO Code of Conduct on Conflicts of Interest**

NWO Domain TTW asks active researchers from research institutes and specialists from other knowledge-intensive organisations to participate in assessment procedures. These people are themselves involved in ongoing or new research and often belong to large organisational associations and research networks. Therefore, any conflict of interests, or anything that remotely resembles this, must be avoided in the assessment of research proposals.

To ensure a fair assessment and transparency for applicants, NWO Domain TTW uses the NWO Code of Conduct on Conflicts of Interest. This code identifies possible forms of conflicts of interest and indicates the steps to be taken to avoid conflicts of interest. Parties subject to the code of conduct are: referees, jury members, committee members, members of decision-making bodies and TTW officers.

The full text of the code of conduct on conflicts of interest used by NWO Domain TTW is available at:

<http://www.nwo.nl/en/about-nwo/governance>.

# After award

(see also the 'General Conditions' as published with this Call at <http://www.ttw.nwo.nl>)

## After awarding

The main applicant becomes the project leader. In the case of large projects, it is necessary to appoint separate sub-project leaders. If the proposal is successful, each research institute involved receives an award letter with appendices. This sets out the legal and financial conditions of funding and should be signed individually for approval by each research institute.

After a proposal has been awarded funding the applicant should elaborate the data management section into a data management plan. Applicants can make use of the advice from the referees and committee when they write the data management plan. The project can start as soon as the data management plan has been approved by NWO Domain TTW.

## Start and starting date of the project

The credits allocated do not become available until after the necessary documents have been signed and received by NWO Domain TTW and all relevant award conditions have been fulfilled. If the latter is not yet the case, for example due to continuing negotiations about intellectual property, written permission to start the project can be requested from NWO Domain TTW. Without such written permission, potential financial risks are borne by the applicant(s). The starting date of the project is the date on which an initial expenditure of allocated funds is undertaken. This is generally not the date of award. It usually relates to the appointment of the first staff member at the project's expense.

## User committees

NWO Domain TTW ensures that the knowledge generated by the research is practically and effectively transferred to users by consulting with the project leader of each research project to set up a user committee on the basis of the users proposed in the project plan.

User committee meetings are attended by the applicants/co-applicants, project/subproject leaders, the researchers temporarily appointed to the project and the users. The project leader acts as chairman and NWO Domain TTW runs the secretariat. A minimum of four (4) users should sit on the user committee and at least 50% of them should be from industry.

During the course of a research project, NWO Domain TTW may change the composition of the user committee if there are grounds for doing so; such changes will always be made with the approval of the project leader. In doing so NWO Domain TTW will make due allowance for the advice of the sitting users and the level of their pledged co-funding, if applicable. The guiding principle will be to ensure that the composition of the user committee maximises the likelihood of the results being applied and that the interchange of ideas, including confidential information, remains possible.

The committee can advise the project leader on the direction the research should take in order to promote the application of the results. The project leader always holds ultimate responsibility for the realisation of the research in accordance with the approved project plan. The instructions for participants in a user committee are included in the 'General Conditions' (see: [www.ttw.nwo.nl](http://www.ttw.nwo.nl)). The members of the user committee are formally invited by NWO Domain TTW to join the user committee. Those participating in the user committee commit themselves to the conditions included in the 'General Conditions' as published with this call.

## Programme committee and programme meetings

A Programme committee consisting of selected experts from the field that may or may not be involved in the research programme as (co-)project leader or user. These experts will be selected by NWO Domain TTW programme coordinator.

After granting the research projects, the Programme committee is responsible for the overall directions and management of the programme. All members of the Programme committee are subject to confidentiality

restrictions to protect any ideas laid down in the university project proposals. Programme committee meetings will be organised at least once a year unless the Programme committee decides differently based on particular needs.

## **Reporting**

The project leader reports on the progress of the project twice a year, in writing, and the user committee meets at least once a year to discuss the progress made. Progress reports always include a financial paragraph. As an exception – to be decided by NWO Domain TTW – the user committee may meet in a different frequency.

Utilisation of the research results is always on the meeting agenda. It covers collaboration with (potential) users and the protection and commercialisation of the knowledge generated. The results of the project are confidential until the user committee agreed to publication and NWO Domain TTW has given permission for publication.

Arrangements made between the project partners in terms of IP and publication (for further information, see below under Notes on Intellectual Property & publication arrangements and Appendix 4) will be upheld provided that they have been approved by NWO Domain TTW.

A publication is the disclosure of results by any means, such as a text (including publications, abstracts, announcements on a website), illustration or an image or sound carrier, with the exception of disclosure resulting from a patent or patent application.

## **Extension**

An extension after the end of a project is possible only in very limited cases, and only possible if the extension does not extend beyond the final date of the Programme. The prospects in terms of utilisation are crucial in this respect. From the utilisation perspective, funds remaining on the project can be used to extend one staff position (1 fte) for a period of up to three months.

## **Termination and termination date**

The termination date of a project is the date on which the last temporary appointment is terminated and after which the final report on project results and outcome has been provided to TTW office.

The project leader then receives two final forms from NWO Domain TTW to round off the project in terms of both content and funding. Unallocated credits cease to be valid after the end of the project. The summaries requested in the final form are used for the purpose of publication in NWO Domain TTW's utilisation report. NWO Domain TTW publishes an annual utilisation report giving progress updates 5 and 10 years after the start of a project.

## **Discontinuation**

NWO Domain TTW may discontinue a project before the official termination date if the obligations based on Project agreement and/or 'General Conditions' are not or are no longer fulfilled, or if the scientific quality of the research and/or utilisation of the results of the research are inadequate.

# Guidelines for applicants

The submission process for this Call is broken down in two separate, subsequent stages: a call for pre-proposals followed by a call for full proposals.

*Please note that each phase follows a different submission procedure.*

## A. Pre-proposal phase

The pre-proposal phase requires the use of the obligatory pre-proposal format (as available from the programme website). No appendices are required at this stage. However, in the case intended users have already supplied a support letter(s), these may also be submitted. In that case, the application form (pre-proposal) together with the merged PDF of the support letters is regarded as the pre-proposal.

### Pre-proposal format

The proposal (sections 1 to 6, both included) should not exceed three (3) pages in A4 format (minimum Verdana 8.5 or similar font), excluding references and (optional) support letters. Additional supplementary information is not allowed. The application should be in English.

**In this programme, a pre-proposal can only be submitted via email to [t.plantinga@nwo.nl](mailto:t.plantinga@nwo.nl). Applications sent to any other email address and/or arriving after the deadline (date and time) will not be considered.**

State clearly in the subject header that the email is intended to submit a pre-proposal in the NACTAR programme, to avoid it being overlooked. The pre-proposal should be submitted as a pdf file, using the obligatory format as provided on the website (see above).

## B. Full proposal phase

**Please note that only proposals that were entered during the pre-proposal phase, can be accepted as full proposals (see section 'Assessment procedure').** The full proposal phase requires the use of the obligatory full proposal format (as available from the programme website).

### Drawing up and submitting the proposal via ISAAC.

A full proposal can only be submitted to NWO Domain TTW via the online application system ISAAC. **Full proposals not submitted via ISAAC will not be considered.**

A principal applicant must submit his/her full proposal via his/her own ISAAC account. If the principal applicant does not have an ISAAC account yet, then this should be created at least **one (1) week** before the application is submitted to ensure that any registration problems can be resolved on time. If the principal applicant already has an NWO-account, then he/she does not need to create a new account to submit an application.

Submitting an application consists of two steps:

- Entering several additional details online in ISAAC. **Make sure you allow enough time for this!**
- Submitting the application form
  - Download the relevant application form from the electronic application system ISAAC or from NWO Domain TTW's website (on the grant page for this programme).
  - Save the completed application form as a PDF file and upload it in ISAAC.

### Required appendices for full proposal phase:

- Form 'Financial planning'
- Form 'Declaration and signing by the applicant'
- Form 'Data management section'
- Letters of support (merged PDF)
- Written confirmation of tenure track position, if applicable

Appendices should be submitted separately in PDF format (without protection). The required appendices together with the application form (full proposal) is regarded as the full research proposal. Appendices other than the required appendices will not be shared with reviewers and assessment committee.

### **Full proposal format**

The proposal (sections 1 to 8, both included) should not exceed fifteen (15) pages in A4 format (minimum Verdana 8.5 or similar font), excluding references and required appendices. Additional supplementary information is not allowed. The application should be in English. In Section 4.1 of the application form, additional sub-chapters may be added.

The information entered in the application should be complete and correct. Incomplete forms or forms that exceed the maximum permitted length may lead to your application not being considered.

### **Technical questions about the use of ISAAC**

For technical questions about the use of ISAAC please contact the ISAAC helpdesk. Contact details can be found in section 'Contact Information'.

**Suggestions for reviewers** can be submitted in ISAAC. Please be aware that **only** suggestions of international independent experts that comply with the NWO Code of Conduct on Conflicts of Interest (e.g. no co-publication or collaborations within the last 5 years) are of use (<http://www.nwo.nl/en/about-nwo/governance>).

# Who can apply?

## Main and co-applicants

On approval of the project, the main applicant becomes the project leader and bears ultimate responsibility for the realisation of the research including the utilisation plan. All co-applicants must play an active role (associate supervisor and/or daily supervision of researchers appointed to the project) in the realisation of the project and may be designated as sub-project leaders in the event of several participating research institutes.

## Who can act as main and co-applicants?

- Assistant, associate and full professors with a tenured position at:
  - Dutch universities (or with comparable positions at the university medical centres).
  - KNAW and NWO-institutes.
  - the Netherlands Cancer Institute (NKI).
  - the Max Planck Institute for Psycholinguistics in Nijmegen.
  - Dubble beamline at the ESFR in Grenoble.
  - NCB Naturalis.
  - Advanced Research Centre for NanoLithography (ARCNL).
- Researchers with a tenure track appointment. NWO Domain TTW defines a tenure track appointment as an appointment for experienced scientific researchers with prospects of permanent employment and a professorship in due course. The tenure track appointment must be confirmed in writing by an official letter from the university and funded from structural resources. NWO Domain TTW will verify that the appointment meets these conditions and that it is guaranteed for the term of the project.

## Main and co-applicants with a part-time appointment

- Main applicants and co-applicants employed on a part-time basis should in any case have access to sufficient university facilities and budget to carry out the project properly.
- Main applicants and co-applicants should carry out NWO Domain TTW research while they are working for the research institute. If this is not the case, the other employer should sign a waiver so as to guarantee knowledge ownership by NWO and the research institute(s).

## Who **cannot** apply?

Main applicants and co-applicants with one of the following positions are **not** eligible to apply:

- Personnel with a zero-hour appointment,
- Personnel with a temporary employment contract (e.g. postdocs, research fellows).
- Emeritus professors.
- Personnel of institutes with an applied or technological objective, such as TNO, the Large Technological Institutes (GTIs) and the non-university part of the Wageningen University and Research Centre (WUR),
- Personnel of a research institute funded by a public-private targeted grant.
- Personnel of foreign research institutes.
- Personnel working for industry or private organisations.

# What can be applied for?

## Project-specific costs

NWO Domain TTW funds project-specific costs of:

1. personnel temporarily appointed to the project at the research institute.
2. materials (consumables, small instruments and aids, and domestic travel expenses).
3. foreign travel.
4. equipment (durable scientific equipment in respect of which economic value is depreciated).

The research institute is responsible for co-funding from direct government funding and hence for the necessary infrastructure and the supervision of project workers.

If an (co-)applicant cooperates with other institutes not eligible for NWO Domain TTW funding, such as TNO or a foreign university, the non-eligible institutes are responsible for their own costs.

## 1. Notes on costs of personnel temporarily appointed to the project at the research institute

Temporary personnel positions can be requested for:

- PhD student.
- postdoc (PD).
- PDEng trainee.
- other SP (scientific personnel, including additional researcher, holders of a master degree (MSc), medical graduates).
- NSP (non-scientific personnel, including technical assistant).
- Casimir candidate.

## Notes on temporary personnel positions

Temporary personnel positions can be requested for up to four years in the case of a full-time appointment. State the job group, the length of the appointment, the part-time percentage and the associated amount. For each position, NWO Domain TTW uses a predetermined fixed maximum rate per year of appointment (see [www.ttw.nwo.nl](http://www.ttw.nwo.nl)). In determining these rates, NWO Domain TTW adopts the rates laid down in the most recent 'akkoord overlaten werkgeverschap NWO/VSNU', with no supplement for the risk of unemployment. Under this agreement, the personnel rates for the positions are determined annually after agreement on the long-range forecast for personnel rates. The rates which apply at the time of award are maintained for the duration of the TTW project. If the personnel rates are changed during the evaluation procedure, NWO Domain TTW will apply the new rates at the time of award. If applicable, this does not affect the level of the compulsory contribution from users.

Personnel appointed to additional personnel positions during the course of the project (e.g. in the event of continuation or extension) are subject to the rates which apply at that time.

For postdoc, scientific personnel and non-scientific personnel positions, NWO Domain TTW does not accept liability under the Dutch Unemployment Insurance Act if the term of appointment is less than 12 months and/or the candidate has more than 1 year's relevant work experience in a previous, similar appointment. The research institute appoints the personnel and bears the customary responsibilities of an employer.

## Notes on permanent staff

The salary or allowance paid to the applicant/co-applicant and the salary or allowance paid to others person with a permanent appointment or other permanent association with the institute where the research is to take place are not eligible for reimbursement. Exceptions to this are the temporary appointment to a project of 1) a technical assistant (NSP) or 2) a scientist with an 'appointment on a project basis'. An NSP with an existing employment contract at the research institute can temporarily be appointed against the standard NSP rates at the expense of a TTW project, if this NSP has a specific special expertise that is necessary for realising the research proposed. A scientist with an 'appointment on a project basis' at the research institute

can temporarily be appointed against the standard scientific personnel rates at the expense of a TTW project. The scientist concerned may not be registered as an applicant or co-applicant at TTW/NWO. NWO Domain TTW accepts no liability under the Dutch Unemployment Insurance Act in this case.

### Notes on secondment

Temporary researchers are appointed to the research institute where the research is to be realised. Because NWO Domain TTW imposes the condition that the majority of knowledge development must take place at the research institute, the secondment of university researchers to a company or other research institute is permitted only for a limited period, i.e. up to 50% of the extent of the appointment. This requires written permission from NWO Domain TTW in advance. A secondment agreement shall be concluded.

Where the need arises, an applicant can submit a reasoned request to the TTW office to grant leniency with regard to the 50% limit. Criteria for this are 1) there must be a need to use the infrastructure of the external party, 2) there must be a sufficient academic environment present at the external party for interaction with and supervision of the researcher and 3) the project leader and/or supervisor of the researcher must also be present at the external location concerned for some of their time.

### Notes on PDEng trainee

A temporary personnel position can be requested for a PDEng trainee (certified training Professional Doctorate in Engineering). This position should be applied for within a larger research context (1 or more other scientific personnel positions). The PDEng trainee is employed by the institute submitting the application and for a fixed period of time can perform certain tasks within the research project at an industrial partner (on a secondment basis).

The PDEng position is subject to the following **conditions**:

- In the research plan and the utilisation section the embedding of the PDEng position should be described and/or the underlying Technological Designer Programme.
- Assuming a full-time appointment, a maximum duration of 2 years applies.
- The personnel rate for a PhD (first 24 months) applies to a PDEng position. The personnel costs are included in the personnel credit.
- For the PDEng position, material and/or travel credit can be applied for as part of the standard credit.
- The contribution of the industrial partner(s) involved to the PDEng position can be entered as co-financing; to be settled in cash with NWO Domain TTW or in kind if the amount is settled via the institution.
- If the project is funded then a secondment agreement must be signed with the industrial partner concerned.

### Notes on Casimir candidate

One SP position can be filled by an academically trained R&D worker from a Dutch company or a company with a Dutch branch where R&D activities are carried out (100% private sector). The following conditions apply:

- Based on a full-time secondment, a 2-year time limit applies. The limit for PhD students is 3 years. Part-time secondment (at least 50%) is possible.
- The proposed candidate should have been working for the above-mentioned private sector employer for at least 1 year (tenured or temporary appointment).
- The application should contain a brief description of the proposed candidate's work experience and expertise. On the basis of the necessary work experience of the relevant candidate, PhD work should be able to be completed within 3 man-years.
- In addition to the Casimir position, at least 1 other SP position must be requested with at least the same extent of appointment.
- The Casimir candidate should have access to the university infrastructure and the Casimir position should be an integral and necessary part of the proposed university research and serves the realisation of the project aims and utilisation. This should be described in the research plan.
- In relation to personnel costs for the Casimir position, the university can declare to NWO Domain TTW the secondment costs actually paid to the company, up to the personnel rate for a postdoc position which applies for the relevant extent of appointment. These costs should be charged to the material

credit for the project. NWO Domain TTW accepts no liability under the Dutch Unemployment Insurance Act for the Casimir candidate.

- Material and/or travel credit can be requested for the Casimir candidate as part of the regular credit to be requested.
- If the project is funded then a secondment agreement must be signed with the company concerned.

## 2. Notes on costs of materials and domestic travel

NWO Domain TTW funds consumables, small instruments and aids, and domestic travel expenses.

The amounts entered in the budget are inclusive of Dutch VAT.

### Notes on Material credit

Costs which **CAN** be charged to material credit:

- Materials which no longer have an economic value after use. This concerns consumables, small instruments and aids.
- Specified compound items. Fixed instalments or rates in particular (e.g. bench fees and fees for standard analyses) must be substantiated. Within the rates accepted by NWO Domain TTW, only the consumables costs can be charged to NWO Domain TTW.
- Personnel costs for Casimir position (see 'notes on temporary personnel').
- Costs of domestic travel.
- Costs of project-specific courses for NWO Domain TTW researchers which are necessary for the conduct of the research.
- Posters for disseminating knowledge at conferences and symposia.
- Pre-clinical trials. A condition in this respect is that the project workers themselves are responsible for the majority of the work (e.g. sampling, analyses).
- Costs for the use of cleanrooms insofar as these fall under the cleanroom regulation (see [www.ttw.nwo.nl](http://www.ttw.nwo.nl)).
- Costs for research activities executed by dedicated specialists employed at research institutions not eligible for NWO funding can be limitedly reimbursed. **Please contact the TTW office.**

Costs which **CANNOT** be charged to material credit:

- 'Miscellaneous' or 'unforeseen' items, unspecified bench fees.
- Patent costs. Where appropriate, NWO Domain TTW will consider the extent to which it will bear such costs.
- Costs of publications or costs of purchasing books and/or journals.
- Costs of publications or books.
- Costs of printing a thesis. A separate reimbursement scheme exists for this (see [www.ttw.nwo.nl](http://www.ttw.nwo.nl)).
- Costs of general courses which form part of researchers' generic education and the generic education of a PhD student (e.g. English, presentation skills, literature searching, laboratory animal science, use of isotopes).
- Costs of desktop computer, laptops, notebooks or similar for administrative purposes (text and data processing) and costs for computer use.
- Generic software. NWO Domain TTW assumes that generic software is available via campus licences,
- Costs associated with the use of computing facilities at SURFsara. If necessary, these costs can be requested from the Netherlands eScience Center (NLeSC) in Amsterdam.
- Costs of using existing infrastructure (depreciation charges), salary costs of permanent personnel, accommodation costs, overheads and administrative and technical support, where these are part of the research institute's customary package of facilities.
- Costs (excluding material costs and cleanroom regulation) of university facilities (e.g. glasshouse space, laboratory animal facilities, specialist research facilities).
- Clinical trials.

## 3. Notes on costs of foreign travel

The foreign travel credit is intended to cover costs associated with participation in conferences and symposia in other countries. Extended visits may also be applied for.

## Notes on short travel abroad

For temporary project workers (requested personnel in the application), NWO Domain TTW applies a maximum standard amount (2000 euro/year/fte) which can be claimed as short travel abroad. Foreign travel costs of applicants and co-applicants can also be claimed up to a joint maximum of 6000 euro per project, provided these costs are directly related to the conduct of the proposed research. In principle, travel costs cannot be claimed for non-scientific personnel (NSP).

If the sum claimed exceeds the maximum standard amount per year it cannot be accepted unless clear arguments are put forward on which NWO Domain TTW and the referees can base their verdict.

## Notes on exchange visits

Temporarily appointed project workers may carry out research at a foreign research institute for a limited period (up to six months) in the context of a TTW project. A foreign researcher may also be temporarily appointed to a TTW project; he or she visits the research institute and participates actively in the conduct of the project.

**Conditions** relating to foreign travel of up to six months' duration:

- NWO Domain TTW must be aware of this type of foreign travel when considering the application, and it must form part of the research planning so that referees can include it in their review.
- A condition for an exchange is that the knowledge acquired as a result of the visit is not present, or is not sufficiently available, at the research institute where the research is being conducted. In the event of acceptance, NWO Domain TTW verifies whether this actually results in a strengthening of the knowledge base for the project.
- NWO Domain TTW reimburses the travel expenses, research costs and a standard amount for accommodation expenses. No (additional) salary costs are reimbursed. For the list of standard amounts for accommodation costs, see [www.ttw.nwo.nl](http://www.ttw.nwo.nl).
- Any intellectual property matters are covered by a separate agreement (waiver/confidentiality) before travel takes place

## 4. Notes on costs of investments

Investments are defined as the use of durable scientific equipment in respect of which economic value is depreciated. Investment costs are entered in the budget inclusive of Dutch VAT.

### Notes on investments

- NWO Domain TTW assumes that the research institute applies a tendering procedure for the purchase of durable equipment and takes account of government procurement guidelines.
- If second-hand equipment is purchased, the original bill must be submitted.
- NWO Domain TTW may be asked to co-fund an item of equipment in proportion to its use. This should be put down in writing after the award.
- The research institute is responsible for the connection, operating costs and maintenance of the equipment purchased (service charges and repairs).
- NWO Domain TTW distinguishes between operation of existing facilities within the research institute and investment in new facilities specifically for the purposes of a TTW project. In the case of operating costs and small-scale investments, NWO Domain TTW pays only the costs of consumables. These costs can be claimed as material credit. NWO Domain TTW will however pay the full cost of capital goods supplied by internal services in those cases where a disproportionate burden is placed on the service in question, provided that a convincing argument is put forward in this respect. NWO Domain TTW will be the judge of this.
- Computers belonging to scientific equipment and specific software used exclusively for the project may be claimed as investment.
- Computing capacity which demonstrably exceeds the normal capacity required for the research in question can be claimed as investment.
- If, in the course of time, it emerges that the costs of the investments described in the proposal are lower than estimated, the remaining funds will revert to NWO Domain TTW.
- NWO Domain TTW may refuse expenditure not estimated in advance.

# Notes on Users, co-funding and letters of support

## Users

Users of research are defined as natural or legal persons (at national or international level) who are able to apply the results of the research. A distinction is sometimes drawn between direct users of the knowledge generated, usually companies, and end users, who buy the products from those companies. Both have a role to play in the innovation chain and must be referred to in the utilisation plan.

At least one of the industrial partners should have a proven interest in developing lead compounds. Start-up companies or SMEs with less than 10 employees can participate as well. Other potential users include clinicians and/or other health care professionals, health insurance companies, etc.

Research proposals from a medical faculty or university medical centre should have potential users, just like other proposals. It is not sufficient in this case to state merely 'the patient' or 'a clinic'. The final composition of the user committee is subject to the same conditions as other TTW projects.

## Co-funding

See 'Specific requirements of the programme'.

## Definitions

- Total project costs: necessary financial resources plus in-kind contributions.
- Financial contribution: Financial contributions are used to cover part of the project costs and so, together with the contribution from NWO Domain TTW, constitute the necessary financial resources.
- In kind contributions: In-kind contributions means capitalised personnel and/or material contributions from users.

## Notes on Criteria relating to co-funding

- NWO Domain TTW uses the financial co-funding to cover part of the project costs. After a project is approved, NWO Domain TTW sends an invoice to users who have pledged a financial contribution. Once the funds have been received, they are allocated to the project.
- NWO Domain TTW accepts personnel input and material contributions as co-funding on the condition that these are capitalised and that they form an integral part of the project. This should be made clear in the description and planning/phasing of the research.
- NWO Domain TTW is the main funder of the projects. Project applications where the co-funding from users exceeds the amount to be borne by NWO Domain TTW will not be considered.
- NWO Domain TTW assumes that providers of co-funding have an interest as users and therefore as applicers of the research results outside science. Co-funders always participate in the user committee.
- Government agencies can play various roles in TTW projects, namely: (1) as a research partner (without entitlement to TTW funding), (2) as a subcontractor of a specific assignment (at market rate) or (3) as a user. Government agencies may act as users under the same conditions as private users.
- The co-funding to be provided by users must be confirmed in a letter of support. These letters must explicitly state: 1) the importance of the research proposal for the organisation, 2) the importance of the utilisation plan for the organisation's operations, 3) the pledged financial and/or the specified capitalised material and/or personnel contribution(s), 4) whether the user intends (i) to allow NWO Domain TTW to take the lead in making IP arrangements in accordance with NWO Domain TTW's current IP policy or (ii) to make its own arrangements with the knowledge institution(s) and user(s) concerned (see also Appendix 4).

See for programme specific requirements the sections 'Letters of support' and the 'Notes on Intellectual Property & Publication arrangements' later in this brochure.

## Notes on Criteria relating to in-kind co-funding

Part of the research may be conducted by third parties. A condition is that the expertise provided in the form of man- hours is not already available at the research institute(s) and is used specifically for the TTW project. For personnel support by third parties, NWO Domain TTW applies fixed rates in order to capitalise the number of man-hours used (up to 1400 direct hours/year/fte) for a senior or junior researcher. For the current rates, see [www.ttw.nwo.nl](http://www.ttw.nwo.nl).

- For pledges of material resources, charge the cost price. Commercial rates are not accepted. For pledges of equipment, take previous depreciation and intensity of use into account.
- Pledges in the form of supplies of services are possible only if the service can be itemised as an identifiable **new** endeavour. The service should not already be available at the research institute(s) realising the research. Applicants may wish to claim services already supplied (such as a database, software or plant lines) as in-kind co-funding. Acceptance is not automatic in such cases. Contact NWO Domain TTW about this. Further consultations will take place to decide whether a specific value can be determined for this supply of services.

### **NOT permissible as the co-funding**

NWO Domain TTW guards against the improper mixing of funding sources: co-funding can never come from direct or indirect (NWO, KNAW) government funding. As a result, co-funding can also never come from the research institute of the (co-) applicant(s) or from institutes which are themselves eligible to apply to NWO Domain TTW.

- Discounts on (commercial) rates for materials, equipment and/or services, for example.
- Costs relating to overheads, supervision, consultancy and/or participation in the user committee.
- Costs of services that are conditional. No conditions may be imposed on the provision of co-funding. Nor may the provision of co-funding be contingent upon reaching a certain stage in the research plan (e.g. go/no-go moment).
- Costs which are not paid by NWO Domain TTW (e.g. clinical trials, costs relating to the exploitation of the research results, service costs equipment).
- Costs of equipment if one of the (main) aims of the research proposal is to improve this equipment or to create added value for it.

## Letters of support

A letter of support is obligatory if co-funding is provided by the users. NWO Domain TTW advises applicants to ensure that the users pay particular attention to endorsing the importance of the utilisation plan for their operations. The letter of support should satisfy the following requirements:

### **A. General requirements**

- Letters of support must be printed on the letter paper of the co-funder.
- Letters of support must be recent (i.e. preferably not older than 6 months).
- Letters of support are addressed to the project leader.
- Letters of support must be written in English.
- The address on the letter is complete and correct.
- Letters of support must be signed by an authorised signatory.
- The cash contribution stated in the letter is exclusive of Dutch VAT and paid to NWO Domain TTW plus Dutch VAT (21%).

### **B. Specific requirements**

- Brief description of the company and the core business (type of company, size, which service, products).
- A statement that the company is interested in and will commit itself to the research.
- An explanation as to why the answering of the research question is important to the company. How does this solution fit in their strategy?
- A brief explanation as to why this particular research group and research proposal are receiving support.

- What the company will contribute in concrete terms (incl. capitalisation) and why this fits in the research proposal/planning.
- Further specification of the in-kind support, both hours (number and/or tariff applied) and materials (numbers; cost price; tariff; percentage that can be attributed to the project, etc.).
- The company provides the contribution described without additional conditions.

### **C. Declaration and signing by the User**

In the final paragraph of the support letter should include the following statements from the company and the representative signs for this:

- The company states that it has read the proposal.
- The company states that it will actively participate in the User Committee (UC).
- The company states that it agrees to the 'General Conditions' and IP arrangements as proposed in the project agreement.

*If so desired the company can satisfy the requirements by submitting together with the letter of support a checked off and signed list of the conditions stated under A, B and C.*

#### **Letters of support are unconditional and do not contain any opt-out clauses!**

The amounts stated in the letters of support must correspond with the amounts stated in the budget presented in the application. A copy or scan of the letter will suffice for the submission of a research proposal. NWO Domain TTW will not approach persons or organisations who have signed letters of support to act as referees (code of conduct on conflicts of interest).

After the research proposal has been awarded funding NWO Domain TTW will request a confirmation of the co-funding ("confirmation obligation third parties") and in relevant cases will record any further arrangements in an agreement.

# Notes on Intellectual Property policy (IP policy) & Publication arrangements

NWO Domain TTW facilitates the transfer of knowledge between the technical sciences and users. In this process it is important that a responsible approach is taken with regard to research results in general, and patentable inventions and discoveries in particular. NWO Domain TTW's aim is firstly to exploit and publish the results of research as widely as possible, whilst retaining the possibility to establish IP rights and to subsequently transfer these rights to user(s) or grant a licence to user(s) for these and, secondly, to stimulate collaboration between researchers and various external companies.

NWO Domain TTW adheres to a set of rules concerning Intellectual Property (IP) that support NWO Domain TTW's mission. NWO Domain TTW's policy is in line with the IP policy adopted by the Netherlands Organisation for Scientific Research [*Nederlandse Organisatie voor Wetenschappelijk Onderzoek*, NWO] and with the '*Rules of Play for public-private collaboration*' as presented to the Lower House of the Dutch Parliament on 25 June 2013. A detailed description of these rules can be found in Appendix 4.

NWO Domain TTW also offers knowledge institutions the opportunity to make their own IP and Publication (IP&P) arrangements with the parties with which they already cooperate and with whom arrangements already are in place ('Option 2'). In this way, NWO Domain TTW hopes to respond better to the wishes of the researchers and co-funders who are involved in TTW projects. It will continue to be possible to opt for the approach whereby NWO Domain TTW takes the lead in making arrangements for IP and similar matters; in such cases, NWO Domain TTW's Intellectual Property policy will be followed ('Option 1').

If knowledge institutions prefer to make their own arrangements, they must make this known - with the approval of the companies concerned - at the time the application is submitted, and have concluded the arrangements **within three (3) months** of receiving NWO Domain TTW's approval for the project. The knowledge institution has the lead in these circumstances. The arrangements will subsequently be reviewed by NWO Domain TTW to ensure they are compatible with four criteria that reflect the task and mission of NWO Domain TTW (see also Appendix 4, under Option 2).

## Available and accessible / fair and affordable price

In addition to the above mentioned four criteria (see also Appendix 4, under Option 2), specifically for this programme the IP arrangements should reflect that the to be developed products will become available and accessible for the healthcare system for a fair and affordable price. The arrangements should at least contain provisions that ensure that these two criteria will have effect in subsequent agreements related to the research and/or the commercialisation of results deriving thereof. Next to this all prices, percentages and distribution of IP-rights related to the commercialisation of (future) products, need to be underpinned. NWO Domain TTW and the Ministry of Health will jointly assess and approve the arrangements under Option 2.

## Make choice known on submission

NWO Domain TTW asks the party submitting the research proposal to indicate, in advance, which option has been chosen with regard to IP&P arrangements for the results of the research. The two options and the attendant implementing conditions are described in the table below (Appendix 4).

# Notes relating to the application form

## FULL Proposal\*

*\*notes apply also to sections of the same name in the pre-proposal format. Please contact the NWO Domain TTW office should you have questions concerning either format. Both the pre- and the full proposal should be written in English*

## 1. Details application

### 1.1. Further details main applicant

The name and address of the main applicant in English. State the additional information, including English name of the organisation/division of the organisation, percentage of full-time appointment and confirmation of permanent employment.

### 1.2. Further details co-applicants

State the name and address of the co-applicants, in English. Also state the additional information, including % of full-time appointment and confirmation of permanent employment.

### 1.3. Title

State the title of the project and an abbreviated title, if any.

### 1.4. Key words

State the specific keywords for the research and specialist area, including popular scientific terms.

## 2. Summaries

Summaries should be clear to potential reviewers and non-specialists, such as committee members whom generally have a broader expertise. Committee members will base their judgement primarily on the opinion of the experts as laid down in the reviewers comments and rebuttal, summaries and utilisation section. It is therefore vital that these sections are worded clearly and concisely, so as to be convincing to committee members. In addition, section 2.3 may be used by NWO Domain TTW for publication purposes; the confidentiality of the data will be taken into account at all times.

### 2.1. Research summary

On a half page of A4, describe the research question, the research and the anticipated results.

### 2.2. Utilisation summary

On a half page of A4, describe the utilisation. State what the committee needs to know about utilisation, the approach taken to it and the likelihood of it being achieved.

### 2.3. Summary NWO Domain TTW's website and online in ISAAC

Add a general summary for NWO Domain TTW's website (10 lines with a number of keywords; be aware of risks with respect to intellectual property). Use this summary online in ISAAC.

## 3. Current composition of the research group

State the composition of the team which will realise the research and the distribution of tasks and responsibilities.

- If more than one research institute is participating in a project, indicate the intended sub-project leaders in addition to the project leader.
- If more than one research institute and/or research group is involved in the project then also indicate which of the co-applicants per research institute and/or research group is the research leader and who is responsible for supervising the researchers.
- If PhD students are among requested personnel please indicate (co-)promotors.
- In the case of a part-time appointment of a (co-)applicant which is less than 0.4 fte, the proposal should indicate which of the permanent staff is responsible for the day- to-day supervision of the project workers.
- The project leader is responsible in all cases for coordination and communication between the participating institutes/research groups/ researchers.

## 4. Scientific description

This section should contain sufficient information to enable an expert reviewer to assess the quality of the research proposal.

### 4.1. Research contents/Introduction

Describe the underlying scientific basis and the content of the project. Indicate the methods and techniques to be used to tackle the problem, the knowledge already available, the state of the art, what has still to be developed and the instruments or models to be used to that end. It is not sufficient to state only the scientific question.

### 4.2 Fit into the Programme

Describe to which Call topic your research proposal is submitted, and how the proposed research will contribute both to reaching the goals of the Programme and the specific goals set for that particular topic. In addition, describe how your research proposal is complementary to ongoing (inter)national efforts on research into antimicrobials and antimicrobial resistance (e.g. ZonMW, FP7, Horizon2020, JPI AMR, IMI).

### 4.3. Existing infrastructure

Specify the research institute(s)/department(s)/ research group(s) where the research will physically take place. This information is used to determine whether the research can be realised at the research institute(s) mentioned.

The available infrastructure includes furnished laboratory space and necessary equipment.

### 4.4. Time plan and division of tasks

Describe the proposed research planning over the years. For each line of research, indicate the phasing and give a clear description of the step-by-step plan (subsidiary aims and/or ultimate aims) and the intended results. Describe how you will manage your project towards reaching the project goals and obtaining the intended results. If different lines of research are dependent on each other, indicate this. A schematic representation of the research planning is compulsory. The overall duration of the research plan may not exceed four (4) years.

## 5. Utilisation plan

The utilisation plan must be clear to people without specific prior knowledge. Give sufficient details to enable referees and Assessment committee members to assess at what point any potential application outside science may be possible.

### 5.1. The problem and the proposed solution

- Describe the problem that you propose to solve and indicate for whom it is a problem. Indicate the social and economic consequences while the problem remains unresolved.
- Describe how the intended research results contribute towards solving the problem.
- Describe how the project and the consortium will be managed so as to achieve maximum focus on reaching the goals of the project.
- Indicate whether the research results can be incorporated into standards or norms. If so, describe.
- Indicate how long after the start of the research it will be before the intended research results lead to an entirely new method or new product, process or service. Describe the market for this. This relates to non-scientific applications.
- Describe if and how the research contributes to the societal challenges described in Horizon2020, the research and innovation programme of the EU  
<https://ec.europa.eu/programmes/horizon2020/en/h2020-section/societal-challenges>.
- Describe if and how the research devotes attention to societal embedding and acceptance.
- NWO Domain TTW regards the development of open- source software code as publication. It may benefit utilisation in certain cases. The utilisation plan should indicate how the promotion of utilisation can be achieved.

### 5.2. Potential users

State the contact details (name of organisation/company and person to contact, address, telephone number, e-mail address) of companies and institutes wishing to participate in the user committee. Indicate the step-by-step plan you intend to use to ensure that the results of the research are effectively applied by users. If third parties are necessary in the course of the project, it is important that they have pledged their cooperation.

Also state whether users have already undertaken to accept an invitation to join the user committee or to cooperate in another way. If users have pledged a contribution to the project, give a brief description here. The co-funding with respect to the budget is substantiated below in point 8.5.

### **5.3. Past performance**

Indicate whether the research team has achieved successful utilisation in the past. Indicate whether scientific results have been commercially utilised. Indicate whether the applications were achieved in a NWO Domain TTW context or otherwise. Design and construction disciplines can also include the strength of their design portfolio, prizes, awards, prize questions won and relevant advisory positions.

Of note, please include any involvement of (co-)applicants with the indicated users or in parties to which paid or unpaid work is to be tendered (e.g. appointment, advisor, member of (governing) board etc.)

## **6. Intellectual property**

State all information relevant to the research proposal in relation to NWO Domain TTW's IP policy. Providing the requested information is compulsory.

### **6.1. Contracts**

State whether there are any existing contracts (including material transfer agreements, licences, cooperation agreements) with third parties in relation to the subject of the research.

### **6.2. Patents**

- 1) Give a summary of patents held and/or patent applications made by intended parties to the project in the field of the research proposal. Indicate whether the patents and/or patent applications are in the name of the research institute(s) involved or in the name of third parties. If the research institutes involved have relevant patents, indicate whether agreements have been reached in this respect with third parties.
- 2) Indicate whether there are any patents and/or patent applications which obstruct the utilisation of the intended research results. If such an obstacle exists, explain whether there is still sufficient likelihood of protecting the intended research results by means of a patent.
- 3) If the patenting of research results is not expedient, explain why not.

## **7. Positioning of the project proposal**

Describe the extent to which the research proposal differs from ongoing research initiatives. Consider both the national and the international context. Also state the relevant collaborations with other national or international research groups.

### **7.1. Uniqueness of the proposed project**

Indicate what it is that makes the research proposal original and innovative. In addition, describe how your research proposal is complementary to ongoing (inter)national efforts on research into antimicrobials and antimicrobial resistance (e.g. ZonMW, FP7, Horizon2020, JPI AMR, IMI).

### **7.2. Embedding of the proposed project**

Provide further information on the embedding of the research plan described here within ongoing initiatives of the research group and/or section.

Indicate whether the research proposal is part of or related to a research programme in which the applicant or applicants' research institute is participating. If so, indicate the research programme in question.

### **7.3. Request for support elsewhere**

State whether funding has been requested elsewhere for this research proposal or parts thereof. If so, indicate the grant provider(s) in question and the status of that application or those applications at the time of submission to NWO Domain TTW.

## **8. Financial planning**

Justify the need for both the personnel credits requested and the necessary materials and investments in equipment. This section should contain sufficient information to enable an expert reviewer to form an opinion on the requested budget.

### **8.1. Personnel positions**

State the necessary temporary personnel positions. Temporary personnel positions can be requested for:

- PhD student.

- postdoc (PD).
- PDEng trainee.
- other SP (scientific personnel, including additional researcher, holders of a masters degree, medical graduates).
- NSP (non-scientific personnel, including technical assistant)
- Casimir candidate.

### **8.2. Consumables**

In accordance with the standards that apply within your research institute, specify the costs of consumables, small instruments and aids, and domestic travel expenses. The amounts entered in the budget are inclusive of Dutch VAT.

### **8.3. Travel abroad**

State the costs of foreign travel. The foreign travel credit is intended to cover costs associated with participation in conferences and symposia in other countries. Extended visits may also be applied for.

### **8.4. Investments**

Specify the investment costs and give a detailed summary of the equipment required. Investments are defined as the use of durable scientific equipment in respect of which economic value is depreciated. Investment costs are entered in the budget inclusive of Dutch VAT.

### **8.5. Contribution from users**

State the financial, personnel and/or material co-funding made available by users for the purposes of the project, if applicable.

### **8.6. Cost Breakdown**

Complete the call specific **Financial Planning (FP) form** available at [www.ttw.nwo.nl](http://www.ttw.nwo.nl), stating any financial contribution(s) and/or capitalised contribution(s).

- Make sure that the capitalised contributions in the budget and the letters of support agree.
- If a project is to be realised at more than one research institute, give a breakdown of the budget for each research institute.
- Notes for the completion of the form can be found in Appendix 1. The form should be submitted together with the factsheet, as a separate appendix in PDF format.
- The main applicant's research institute concludes a funding agreement with NWO.
- A research proposal with a budget which does not comply with the necessary co-funding will not be considered.

### **8.7. Letters of Support**

As confirmation of the co-funding to be provided, submit the letters of support (in English) with the application form combined PDF.

## **9. References**

### **9.1. Selection of key publications research group**

State the key publications of the research group(s) in relation to the proposal. Also state any relevant published patents. Design and construction disciplines can, if so wished, provide an overview of designs realised (selected works).

### **9.2. List of publications cited**

State the publications cited (preferably without *et al*). Identify those in which members of the research group(s) submitting the application are involved, by the use of a bold font. Design and construction disciplines can, if so wished, include a list of publications from other people about their designs (Avery Index to Architectural Periodicals, Columbia University, New York).

## **10. Abbreviations and acronyms**

It is important that both experts and committee members are able to read the proposal easily. Abbreviations and acronyms should therefore be explained at least once. This can be done in the text itself or in a separate list. Keep the use of abbreviations in summaries to a minimum.

## **Declaration and signing by the applicant**

After completing the information requested (see Appendix 3) on the form 'Declaration and signing by the applicant', available at [www.ttw.nwo.nl](http://www.ttw.nwo.nl), please sign the application as truthfully completed, on your own

behalf and on that of the co-applicant(s). This form is a compulsory element of the application and should be submitted with the application form as a separate appendix in PDF format.

## **Finally**

In the event of uncertainties or costs to be claimed which are not mentioned in this brochure, NWO Domain TTW recommends that you contact the TTW office before submitting the application.

# Contact information

## NWO Domain Applied and Engineering Sciences

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## Technical questions about the online application system ISAAC

For technical questions about the use of ISAAC please contact the ISAAC helpdesk. Please read the manual (tab 'Help') first before consulting the helpdesk. The ISAAC helpdesk can be contacted from Monday to Friday between 10:00 and 17:00 hours CE(S)T on +31 (0)20-3467179. You can also submit your question by e-mail to [isaac.helpdesk@nwo.nl](mailto:isaac.helpdesk@nwo.nl). You will then receive an answer within two working days.

## Links

- Ministry of Health, Welfare and Sport  
<https://www.government.nl/ministries/ministry-of-health-welfare-and-sport>
- Netherlands Organisation for Scientific Research (NWO):  
<http://www.nwo.nl/>
- NWO Domain TTW  
<http://www.ttw.nwo.nl>
- NWO Domain Science  
<http://www.nwo.nl/en/about-nwo/organisation/nwo-Domains/enw>
- Topsector Chemistry: Knowledge & Innovation Agenda (in Dutch):  
<http://topsectorchemie.nl/kia>
- Topsector Chemistry: Roadmap Chemistry of Life (in Dutch):  
<http://www.topsectorchemie.nl/chemistry-of-life>
- Netherlands Antibiotic Development Platform (NADP):  
<http://nadp.nl/>
- Netherlands Centre for One Health (NCOH):  
<http://ncoh.nl/>
- Netherlands Organisation for Health Research and Development (ZonMW) research programme on antimicrobial resistance:  
<https://www.zonmw.nl/en/research-and-results/one-health/programmas/programme-detail/priority-medicines-antimicrobial-resistance/>
- Genbiotics:  
<http://www.genbiotics.nl/>
- Innovative Medicines Initiative overview of ongoing projects:  
<http://www.imi.europa.eu/content/ongoing-projects>
- EU Joint Programming Initiative on Antibiotic Resistance (JPI AMR):  
<http://www.jpjamr.eu/>
- World Health Organisation publication on important antimicrobial target organisms:  
<http://www.who.int/mediacentre/news/releases/2017/bacteria-antibiotics-needed/en/>
- ISAAC:  
<https://www.isaac.nwo.nl/>; *An ISAAC manual can be found in ISAAC (tab 'Help')*
- ISAAC helpdesk:  
[isaac.helpdesk@nwo.nl](mailto:isaac.helpdesk@nwo.nl)
- Open calls NWO Domain TTW:  
<http://www.ttw.nwo.nl/nl/calls?type=288>
- Code of Conduct on Conflicts of Interest:  
<http://www.nwo.nl/en/documents/nwo/legal/nwo-code-of-conduct-on-conflicts-of-interest>
- Cleanroom regulation:  
<http://www.ttw.nwo.nl/en/content/applicant>
- Fixed rates in salary tables:  
<http://www.ttw.nwo.nl/en/content/applicant>
- Standard amounts for capitalisation of co-funding of personnel costs:  
<http://www.ttw.nwo.nl/en/content/applicant>
- Standard amounts for foreign accommodation expenses:  
<http://www.ttw.nwo.nl/en/content/applicant>
- Payment of thesis printing costs:  
<http://www.ttw.nwo.nl/en/content/project-leader>
- Nagoya Protocol:  
<https://www.cbd.int>

# Appendix 1: Notes for the completion of an FP form

The FP form (Financial Planning; Excel file) should be submitted with the application form, as a separate appendix in PDF format.

## Notes

- Personnel credits are entered per establishment post. For each person, enter a training place number, a personnel category, the extent of the appointment, the number of months and the accompanying rate (page 3). Check that you have the most recent personnel rates. The rates are set as from 1 July each year but may be adjusted in the interim.  
When calculating the amount, take into account the extent of the appointment (the personnel rates are based on 1 fte) and the year of appointment (start in month 13 is rate from month 13).  
**NB:** In view of their salary structure, PhD students are always appointed at the rate from month 1.
- Material credit and investment credit are entered inclusive of Dutch VAT.
- Material credit, foreign travel credit and investment credit are entered as a total.
- The personnel credit, material credit, foreign travel credit and investment credit combined, constitute the total necessary financial resources.
- In the case of co-funding in kind, enter the official name of the co-funder, a brief description of the material and/or personnel contribution and the capitalised amount. This co-funding is not included in the four credits mentioned above, but does count towards the total project costs.
- In the case of co-funding in cash, enter the official name of the co-funder and the amount pledged by the co-funder. This amount should be entered as a negative amount.  
These financial contributions are used by NWO Domain TTW to cover part of the project costs. NWO Domain TTW collects the financial contribution and then allocates it to the project.
- All co-funding requires a letter of support in English from the co-funder, stating the amount pledged.
- Research proposals with budgets that do not meet the compulsory co-funding requirement (graduated scale) are not considered.
- Unallocated credits cease to apply at the end of the project.

Please contact the TTW office in case of uncertainties.

# Appendix 2: Co-funding calculation example

## Co funding criteria:

For each project the total project costs (required financial resources plus in-kind contributions) consist of at least 15 % co-financing from users (cash and in-kind contribution). Co-funding is calculated as the added total contribution from all users, and can consist of financial (in cash) and in-kind contributions. Of note, co-funding may never be 50% or more of the total project cost.

|   |  |
|---|--|
| <b>Total budget requested TTW / VWS</b><br>Max. 85%; Max. 750k€ | <b>Required total co-funding</b><br>> 15% and <50% (in cash + in kind)                     |
|   | <b>Minimal required cash co-funding</b><br>Entry fee for each company (≥ 2) in the project |

In this research programme, each project requires the participation of at least 2 companies in the user committee, and an 'entry fee' (financial contribution) is required from each industrial partner. The 'entry fee' for start up's and SMEs equals 5.000 euro in cash, for larger companies 10.000 euro in cash is required.

## Examples of funding calculations for research proposals.

### Example 1: Maximum TTW/VWS budget requested; minimal co-funding requirements

For a project with 2 contributing industrial partners, one of which an SME and a total requested budget TTW/VWS of 750.000 euro the calculation can be performed as follows:

|  |                     |
|--|---------------------|
| Total project budget requested at TTW/VWS:                   | 750.000 €           |
| Total contributions from users required (in cash + in kind): | 132.353 €           |
| Company 1 (SME):   | 5.000 € (in cash)   |
| Company 2 (non SME):   | 10.000 € (in cash)  |
| Company 1+2:   | 117.353 € (in kind) |
| Total project costs:   | 882.353 €           |

### Example 2: TTW/VWS budget requested; relevant co-funding contributions

For a project with 4 contributing industrial partners, three of which are SMEs and the fourth company contributes more than the required minimal in cash contribution. With the total requested TTW/VWS budget of 450.000 euro, the calculation can be performed as follows:

|  |                    |
|--|--------------------|
| Total project budget requested at TTW/VWS:                   | 450.000 €          |
| Total contributions from users required (in cash + in kind): | 79.412 €           |
| Company 1, 2 and 3 (SME):                                    | 15.000 € (in cash) |
| Company 4 (non SME):   | 22.500 € (in cash) |
| Company 1+2 + 3 +4:  | 41.912 € (in kind) |
| Total project costs:   | 529.412 €          |

We recommend that you contact the TTW office in case you have questions or doubts.

# Appendix 3: Specimen form 'Declaration and signing by the applicant'

This form should be submitted with the application form as a separate appendix in PDF format.

Declaration and signing by the applicant:

- All applicants and co-applicants satisfy the criteria relating to 'Who can act as main or co-applicant?'
- All compulsory letters of support are attached (separate appendices in PDF format).
- The 'Financial Planning' form is attached (separate appendix in PDF format).
- By submitting this document I declare that I satisfy the nationally and internationally accepted standards for scientific conduct as stated in the Netherlands Code of Conduct for Scientific Practice 2012 (Association of Universities in the Netherlands).
- Where applicable: Funding has been requested for (parts of) this research proposal from another funding provider (other than indicated potential users).
- Where applicable: I agree to comply with the Code on Openness in Animal Testing<sup>1</sup>.
- Where applicable: I agree to comply with the Nagoya Protocol (see Links).

I hereby declare that I have truthfully and completed and signed the application, including the answers to the following questions, and that I have also done this on behalf of the co-applicants.

**Surname and initials:**

**Place:**

**Date:**

**Signature:**

In relation to NWO Domain TTW's Intellectual Property Policy, please answer the following questions. Please provide a brief explanation where necessary.

1. Are there any applicants or co-applicants who are involved in one of the indicated users or in parties to which paid or unpaid work is to be tendered? yes/no If so, state the nature of the involvement (appointment, advisor, member of (governing) board, etc.).
2. Are there any users who indirectly (e.g. via material or investment credit) receive NWO Domain TTW finances? yes/no If so, this should be stated in the research proposal (8.5).
3. Make a choice: NWO Domain TTW takes the lead in making Intellectual Property & Publication arrangements (Option 1) or your knowledge institution takes the lead in making Intellectual Property & Publication arrangements (Option 2).

**[Check your choice with the Tech Transfer Office\(s\) \(TTOs\) of the university/universities and potential user/users involved.](#)**

- Option 1: NWO Domain TTW takes the lead
- Option 2: Knowledge institution takes the lead

If you check Option 1 above, please answer questions 4 through 11.

If you check Option 2 above, please answer questions 12 and 13.

**Option 1:**

4. The knowledge generated in the project will be jointly owned by the research institute(s) and NWO. Are the intended user committee members who shall provide co-funding aware of this? yes/no

---

<sup>1</sup> If the project involves animal experimentation, the applicants declare that they agree to comply with the 'Code on Openness in Animal Testing', as drawn up by the KNAW, VSNU and NFU (April 2008).

5. Are the users aware of the final version of the research proposal, of each other's involvement and any positions with regard to intellectual property? yes/no
6. Are there already any verbal or contractual agreements between (one of the) users and the research institute(s) submitting the application? yes/no
7. Are there any users who wish to enter into contractual agreements at the time when the project is awarded? For example, a joint expression of the wish to use the right to an option. yes/no
8. Are any materials or methods/technologies/ software of third parties (including users) used which are subject to restrictions or commercial secrecy? yes/no
9. Are any materials or methods/technologies/ software of third parties (including users) used which were obtained through the signing of a material transfer agreement? yes/no If so, which conditions are imposed on their use?
10. Are there any relevant patents/patent applications on the part of the research groups involved and/or potential users? yes/no
11. Are there any relevant patents on the part of parties not involved in the project application which might obstruct the utilisation? yes/no

**Option 2:**

12. Are all the users and knowledge institutions involved in agreement that own Intellectual Property & Publication arrangements are to be made?
13. Are all users and knowledge institutions involved aware that the Intellectual Property & Publication arrangements must satisfy certain conditions, and that failure to satisfy these conditions within the given time limit will result in the cancellation of the allocation of funding?

**Initials:**

**Other:**

- The research described in the proposal falls within the top sector(s): (see selection list)
- The research described in the proposal falls within the scientific disciplines: (see selection list)

**Please note:** It is **obligatory** to fill in this main discipline in ISAAC (tab "General Information" section "Research fields") before submitting the proposal.

# Appendix 4: IP arrangements

## Option 1

### NWO Domain TTW takes the lead in making Intellectual Property and Publication\* arrangements ('TTW IP&P arrangements')

Part 3 of the 'General Conditions' on 'Intellectual Property & Publication' is applicable.

#### Access to foreground IP rights for private party or parties / consortium:

- 0-10% private contribution private party or parties: private party/parties have no automatic right
  - 11-30% private contribution private party or parties: private party, parties or consortia have right of option
  - 31-50% private contribution private party or parties: non-exclusive non-transferable commercial licence + right of option to exclusive right. Contribution towards patent costs can be required
  - Private parties can combine their contributions so as to achieve a more favourable ranking
  - Confidential information remains confidential
  - Results can always be published but publication may be suspended for a maximum of 9 months in connection with the protection (patent) of the results
- Agreements must be confirmed in writing within six months of the project being awarded
- *Further information on Options 1 and 2 can be found in the 'General Conditions' and in the relevant/underlying 'Guidelines for financing applications'*

## Option 2

### Knowledge institution takes the lead in making Intellectual Property and Publication\* arrangements ('Own IP&P arrangements')

- 'Own IP&P arrangements' fulfil the following criteria:
  - i All necessary foreground information (IP ensuing from the TTW project) and - insofar as legally possible - background information (already existing IP from company and/or knowledge institution) is available for the execution of the project
  - ii The agreement is aimed at the application or allocation of the results by way of publication
  - iii Publication of scientific knowledge from the project will not be obstructed by users, but the beneficiary and users may determine the publication schedule
  - iv Any results generated from the project by the beneficiary remain available for the beneficiary for educational and research purposes
- On submission: The knowledge institution(s) and all users agree that the provisions under 'Own IP&P arrangements' will apply to the TTW project and declare that they do or will satisfy the criteria from i to iv above  
After award: The knowledge institution(s) and all users approve the agreement in writing
- NWO Domain TTW will receive, no later than three (3) months after awarding the project:
  - i. The signed agreement in which IP&P arrangements are made with the user(s)
  - ii. A signed IP&P statement in which the knowledge institution declares that the agreement relating to the IP&P arrangements with the user(s) satisfies all the pre-determined criteria. The knowledge institution hereby refers to the relevant provisions in the agreement
- NWO Domain TTW reviews the agreement against the pre-determined criteria; if NWO Domain TTW approves the agreement, NWO Domain TTW informs the project leader - in accordance with Article 2 (4) of the 'General Conditions' - that the project can be started

**\*NB:** All scientific publications resulting from research that is funded by grants derived from this Call for proposals are to be immediately (at the time of publication) freely accessible worldwide (Open Access). There are several ways for researchers to publish Open Access. A detailed explanation regarding Open Access can be found on [www.nwo.nl/openscience-en](http://www.nwo.nl/openscience-en).

## Notes on Option 1: when NWO Domain TTW makes Intellectual Property & Publication arrangements

NWO Domain TTW takes the lead in the negotiations on the subject of IP&P arrangements. Once a project has been approved, all users that contribute to the project receive a letter from NWO Domain TTW informing them that the project has been awarded to the knowledge institution. In addition, NWO Domain TTW asks the user to sign the letter to (re)confirm its participation in and contribution to the project. The user can also indicate a desire to enter into a more comprehensive agreement, setting out the reciprocal rights and obligations involved in the cooperation. That is possible.

Further details of NWO Domain TTW's IP policy can be found below.

### The main principles of NWO Domain TTW's IP policy are as follows:

- **Ownership of the results of research**

The results of research carried out by the research institute(s) in the context of a TTW project are owned jointly by the participating institute(s) and by NWO.

- Ownership of the results of research that are generated exclusively by user(s) in the context of a TTW project is vested in the user(s) in question. The user(s) will allow NWO Domain TTW and the research institute 'freedom to operate'.
- The results of research that are generated jointly by the research institute(s) and the user(s) in the context of a TTW project are owned jointly by the participating institute(s) and by NWO. If the co-inventing user has itself provided more than 10% of the project funding in the form of personnel, that user will be granted a non-exclusive, royalty-free and non-transferable licence for the use of the invention, patent or patent application.
- Existing IP rights continue to be vested in the holder(s) of such right who contribute these rights to the project. Insofar as it is possible under the law, and insofar as it is not detrimental to the reasonable commercial interests of the right holder, this/these right holder(s) will facilitate, at their own discretion and in all reasonableness, a freedom to operate.
- 'Freedom to operate' means that the holder of the intellectual property right grants licences to others within the project:
  - insofar as legally possible;
  - insofar as necessary for the project (without charge);
  - insofar as necessary for the exploitation of the results of the research and possible concomitant results (at a fair market price);
  - insofar as such freedom to operate is not detrimental to the reasonable commercial interests of the right holder.

- **Protection of research results, confidentiality and publications**

NWO Domain TTW attaches considerable importance to the protection of knowledge in the process of knowledge transfer. Users admitted to the user committee, undertake to maintain confidentiality with regard to the research results. However, parties can agree - either prior to or during the lifecycle of the project - that protection of the knowledge generated by the project can be suspended if that would be beneficial to the commercial exploitation of the expertise and intellectual property generated by the project.

Research results that are not susceptible to IP protection, and not subject to a written know-how licence, can be used freely by all parties. The researcher is obliged to report any invention to NWO Domain TTW immediately. Draft publications are submitted to the user committee by NWO Domain TTW; the committee is asked whether, in their opinion, the publication contains a patentable invention and/or whether there are utilisation opportunities. If knowledge protection measures need to be taken, such as the submission of a patent application, NWO Domain TTW may decide to suspend the publication for up to 9 months.

- **Commercial usage rights to results that accrue in part or in whole to NWO Domain TTW and the research institute(s)**

- **Contribution 0-10%**

A user who contributes less than 10 percent to the costs of the research project by way of in-kind or in-cash resources will be the first party to receive information about the results of the research.

Companies are at liberty to use the results generated by the research for internal, non-commercial purposes.

- **Contribution between 10% and 30%: Right of option**

A user who contributes more than 10 percent to the costs of the research project by way of in-kind or in-cash resources is also entitled to a right of option on a licence to, or the transfer of the results of the research when full or joint rights are held by NWO and the research institute(s). If a user exercises this option, the transfer of an exclusive or non-exclusive licence will be effected against payment of a fair market price (see below). If multiple users are eligible for an option, an agreement will be made as to the scope of their usage. If this is not possible, the contributing users will be granted a joint option on a semi-exclusive licence.

- **Contribution between 30% and 50%: Right of option on a commercial NERF right**

A user who contributes more than 30 percent to the costs of the research project by way of in-kind or in-cash resources will also have the same rights as a user who contributes more than 10 percent. If the user exercises his right of option, that user is entitled to a non-exclusive, royalty-free (NERF) and non-transferable commercial right of use.

If required, NWO Domain TTW or the research institute(s) will oversee the administration of the patent application process for the first 30 months following the patent application. Before the end of that period, NWO Domain TTW, the research institute and the user in question will make arrangements about the further handling of the patent application.

If one or more users within the project are eligible for an option, an agreement will be made as to the scope of the option on an exclusive licence. If this is not possible, the contributing users will be granted a joint option on a semi-exclusive licence.

The total value of co-funding of any TTW project may not exceed 50 percent.

- The percentage is calculated by comparing the entire contribution made by the private party (in-kind plus in-cash) against the contribution from NWO Domain TTW plus all other in-kind and in-cash contributions.

- **Combining contributions from companies**

Companies have the opportunity to combine their contributions within a single TTW project so as to achieve a more favourable cumulative percentage. The companies are then, as a group, eligible for the abovementioned rights (right of option and/or non-exclusive commercial right of use). To be eligible for such aggregation, it is a condition that the companies in question notify NWO Domain TTW of this in writing. This letter must also appoint an official secretary/a representative who will be responsible for negotiating with NWO Domain TTW on behalf of the parties concerned as to how the option will be exercised. The letter must be signed by all companies involved. It should, preferably, be submitted to NWO Domain TTW together with the project proposal or, if not, within six (6) months of the approval of the project.

- **Patent costs**

The following provisions apply if the user deems it desirable that a patent application be submitted:

- The patent application is submitted in the name of NWO and the research institute(s) where the invention or discovery takes place.
- The user bears the costs of the patent. The patent costs are not offset in the calculation of a fair market price.
- If there are multiple licensees, the patent costs will be shared among them.

- **Licensing**

The right to use or apply research results is acquired through a licence, transfer agreement or know how agreement.

In all cases, a licence agreement or transfer agreement will contain provisions concerning:

- exclusivity or non-exclusivity;
- royalty-free research and education licence for NWO and the research institute(s) concerned;
- determination of a fair market price (with the exception of a NERF licence when contributions exceed 30%);
- anti-freezer clause or best endeavours obligation concerning application or commercialisation
- reporting obligations;
- indemnification against liability on the part of NWO and the knowledge institute(s);
- market price + discount arrangements.

The market price will be determined by negotiation between the parties; a record will be kept of these negotiations. In determining the fee to be paid, use can be made of the 'market-based

approach' (i.e. market comparison), the 'income-based approach' (i.e. what income is expected), and the 'cost-based approach' (i.e. what has it cost to achieve the research results). The services of an impartial expert can also be called upon, or a combination of the above methods can be chosen. The user will be entitled to a discount on the fair market price fee which is related to the level of the contribution provided towards the costs of the research project.

- o Income received from transfer or licensing will be disbursed to the research institutes for further research.

NWO Domain TTW should receive prior warning about any obstacles to the free use or exploitation of results. Should any obstacles to the implementation of NWO Domain TTW's IP policy emerge, NWO Domain TTW will impose additional conditions. If it emerges during the course of the project that the project leader has failed to notify NWO Domain TTW about such relevant information, NWO Domain TTW may suspend the project until the obstacles concerned have been removed. NWO Domain TTW may request access to contracts and/or patents in this respect. Contracts must not be in conflict with NWO Domain TTW's IP policy. If it emerges that NWO Domain TTW cannot have free access to the results of the TTW research, NWO Domain TTW may decide not to award or to discontinue the project.

## **Notes on Option 2: when own Intellectual Property & Publication arrangements are made**

If the knowledge institution elects to make its own arrangements with the user for Intellectual Property rights and Publication, those arrangements must be set out in writing. They must also satisfy the following conditions:

- i. All necessary foreground information (IP ensuing from the TTW project) and - insofar as legally possible - background information (already existing IP from company and/or knowledge institution) is available for the execution of the project;
- ii. The agreement is aimed at the application or sharing of the results by way of publication;
- iii. Publication of scientific knowledge from the project will not be obstructed by users, but beneficiaries and users may determine the publication schedule;
- iv. Any results generated from the project by the beneficiary remain available for the beneficiary for educational and research purposes.

Furthermore, the following conditions apply on submission or on award of a project:

- On submission: the knowledge institution(s) and all users agree that the provisions under 'Own IP&P arrangements' will apply to the TTW project and declare that they do or will satisfy the criteria from i to iv above.
- After award: The knowledge institution(s) and all users approve the agreement in writing.

Within three (3) months of the award of the project, the applicant knowledge institution will submit a copy of the agreement to NWO Domain TTW, indicating where arrangements for each of the specified conditions can be found.

Within three (3) months of the award of the project, all knowledge institutions and users concerned will also declare that all the conditions have been satisfied; this will be done by signing and returning the contract.

If, on review, it transpires that the arrangements made do not satisfy the conditions set out above, NWO Domain TTW can extend the original three (3) month period after award by a further period of up to two (2) months, to enable the user(s) and the knowledge institutions to modify the arrangements so that they do satisfy the pre-determined conditions.

If at the end of this period the conditions have not been satisfied, this means that the conditions attached to the award have not been fulfilled and there can be no allocation of funding.

# Appendix 5: Evaluation items

## 1. Scientific quality

- 1.1. To what extent is the proposed research original and how would you rate the innovative elements?
- 1.2. What is your assessment of the design of the project, including the goals, hypotheses, research methods, and scientific feasibility?
- 1.3. What is your assessment of the coherence and time schedule of the proposed lines of research?
- 1.4. Is the research group competent enough to carry out the research? Does the group have a relevant position in the international scientific community? Is the available infrastructure adequate?
- 1.5. Are the number and category of requested personnel, budget for materials, investments, and foreign travel adequate?
- 1.6. What are the strong and weak points of the scientific part of the proposal?

## 2. Utilisation potential (the application of the results of the research by third-parties)

- 2.1. What is your assessment of the description of the commercial and/or societal potential impacts of the research given in the proposal?
- 2.2. What is your assessment of the contribution and commitment of the user(s) and the proposed composition of the user committee?
- 2.3. Do you expect the application of results to be hampered by commercial propositions, existing patents, eligibility or societal acceptance?
- 2.4. What are the prospects for collaboration with the industry and knowledge transfer, assuming the project is successful? Please address both aspects.
- 2.5. What is your assessment of the research group's competence regarding the transfer and application of research results?
- 2.6. What are the strong and weak points of the utilisation plan?

## 3. Fit in the programme

- 3.1. What is your opinion regarding the strategic contribution of this project to the aims of the Programme (see Programme description)?

### Data management

The data management section is a compulsory part of the application but it will not be an assessment criterion for obtaining funding. It will not be included in the decision of a committee as to whether or not a proposal should be awarded funding. However for the data management section of this proposal, you can make suggestions and give advice that could be helpful for the researcher in drawing up the data management plan to be submitted after funding is awarded.

# Appendix 6: Evaluation scales

## Scientific quality

### 1. Excellent

- An excellent researcher or outstanding research team.
- A well-chosen problem.
- The method is especially/pre-eminently effective and original.
- Very urgent.

### 2. Excellent to very good

### 3. Very good

- A competent researcher or competent research team.
- A significant problem.
- The method is original and effective.
- An urgent approach is important.

### 4. Very good to good

### 5. Good

- An average researcher or average research team.
- A routine problem.
- With the method, which has some original details, the project can be addressed, although other possibilities are conceivable.

### 6. Good to moderate

### 7. Moderate

- It is far from certain that this work is within the capacity of the researcher and / or the research team: the proposal itself contains no obvious errors.
- The problem is moderately interesting.
- Whether the project can be successfully tackled with this standard method, is questionable.
- The project may well be postponed.

### 8. Moderate to poor

### 9. Poor

- The competence of the investigator or research team is inadequate.
- The proposal contains serious errors or mistakes.
- This old method is not good for this project.
- Not to be executed, even if there is money left.

## Utilisation

### 1. Excellent

- This will certainly lead to important new techniques or to very important applications in industry, society and other sciences.
- This research is urgently needed to make an estimate of the consequences of the use of this technology or technique.
- The utilisation is very well thought out and the approach ensures the greatest likelihood of an effective use of the results.

### 2. Excellent to very good

### 3. Very good

- This research will likely lead to important new techniques or to important applications in industry, society, or in other sciences.
- This research is highly desirable to make an estimate of the consequences of the use of this technology or technique.
- The utilisation is well thought out and the approach makes it plausible that the results of this work will be used well.

### 4. Very good to good

### 5. Good

- This work will possibly lead to new technologies or applications that might be useful for industry, society, or other sciences.
- This research will be needed to make an estimate of the impact of this technology or technique.
- The utilisation is sufficiently thought through, it can probably be improved during the execution of the work. The results of this work will probably be used.

**6. Good to moderate**

**7. Moderate**

- Technically this work could possibly be useful at some time or it is conceivable that in due course another science, industry or society or of the results could make use of it.
- The results of this research are not exactly awaited, but they may be useful in the future if an evaluation is made of the consequences of using this technology or technique.
- The utilisation is very unsatisfactory. This should certainly be improved, otherwise it is likely that the results of this work will not be used.

**8. Moderate to poor**

**9. Poor**

- Technically the work is bad and redundant, i.e. different, better or similar techniques, which are cheaper are already available.
- This study does not evaluate the consequences of using this technology or technique, moreover, it increases the confusion.
- The utilisation is completely wrong.

**Fit in the programme**

**1. Excellent**

- The project fits the programme exactly.
- It is in the heart of one of the topics of the programme, or
- This is a key project for the topic of the programme.

**2. Excellent to very good**

**3. Very good**

- The project fits the programme very well.
- It is a very good elaboration of one or more of the topics addressed in the programme.
- This is very important project for the topic of the programme.

**4. Very good to good**

**5. Good**

- The project fits the programme.
- It is a good elaboration of one of the topics, but some parts are outside the scope of the programme.
- This project could give an important contribution to the topic of the programme. For this, it is important to focus it on the topic of the programme during its execution.

**6. Good to moderate**

**7. Moderate**

- The project partly fits the programme.
- The described work has some relation with the topic of the programme, but the main activities are outside scope.
- This project can only have a minor, indirect contribution to the topic of the programme. Its main focus is on a different topic or it focuses on a minor and/or insignificant part of the topic.

**8. Moderate to poor**

**9. Poor**

- The project does not fit the programme.
- The described work is not in any of the topics of the programme.
- The vocabulary of the programme is used but in the wrong context or without substantiation in the research activities.
- This project will have no contribution to the topic of the programme.

# Appendix 7: Specimen form 'Data management'

## Notes on Data management section

NWO wants to contribute to the development of good data management by asking researchers to make all relevant data sustainably available for reuse. Therefore in the data management section, researchers will be asked before their research starts to think about how the data collected should be ordered and categorised such that it can be made freely available. Researchers will often need to take measures to this effect during the production and analysis of the data.

NWO understands 'data' to include collected, unprocessed data as well as analysed, generated data. This includes all conceivable forms of digital and non-digital data (such as samples, completed questionnaires, sound recordings, etc.).

**NWO only requires the storage of data that are relevant for reuse.** NWO assumes that within disciplines there are widely held opinions about which data are relevant for storage and reuse. Research Data Netherlands offers a <http://www.researchdata.nl/diensten/datamanagement/onderzoeksgegevens-selecteren/> for the selection of data that can be eligible for archiving.

Research results should be stored in such a way that they can be retrieved and reused in the long term, also by researchers in disciplines and organisations other than those in which the research took place. The operating principle is that all stored data are, in principle, freely accessible and that access is only limited if aspects such as privacy, public security, ethical limitations, property rights and commercial interests require that.

The costs of data management are eligible for funding and should be included in the project budget.

Important factors that determine the costs are:

- the type of data;
- the capacity needed for storage and backup;
- the amount of manual work needed to allocate metadata and the compilation of other documentation such as codebooks and the queries used in the statistical package;
- the extent to which the data needs to be protected;
- the hiring in of external data management expertise or other expertise.

With the data management section NWO mainly wants to raise awareness about the importance of responsible data management. The section is therefore not included in a committee's decision about whether a proposal should be awarded funding or not. NOW Domain TTW does, however, submit this section to the committee and referees for advice. After a proposal has been awarded funding the researcher should elaborate the section into a data management plan. For this, applicants can make use of the advice they have received.

## Questions Data management section

1. Will data be collected or generated that are suitable for reuse? Yes / No

*If Yes: Then answer questions 2 to 4*

*If No: Then explain why the research will not result in reusable data or in data that cannot be stored or data that for other reasons are not relevant for reuse*

Explanation:

2. Where will the data be stored during the research?
3. After the project has been completed, how will the data be stored for the long-term and made available for the use by third parties? To whom will the data be accessible?
4. Which facilities (ICT, (secure) archive, refrigerators or legal expertise) do you expect will be needed for the storage of data during the research and after the research? Are these available?\*

\* *ICT facilities for data storage are considered to be resources such as data storage capacity, bandwidth for data transport and calculating power for data processing.*

# Appendix 8A: Topics which are welcomed within this call for proposals

## Topics that are welcomed within the Call for Research Proposals

### 1. Development of novel antibacterial lead compounds

- Novel antibiotic (sub-)classes
- Novel antibiotics of known classes of natural products, e.g. polyketides (PKS), non-ribosomal peptides (NRPS),  $\beta$ -lactams, ribosomally synthesized post-translationally modified peptides (RIPPs)
- Screening of underexplored natural resources; harnessing biodiversity
- Genomics-based approaches including heterologous gene expression
- Synthetic antibiotics, bio-inspired compounds, structure-based design
- Novel molecules that specifically target resistance mechanisms (such as clavulanic acid that inhibits  $\beta$ -lactamases)
- Synergistic action between two compounds that enhance activity and reduce toxicity and rate of resistance development
- Novel molecules (or concepts) that target biofilm formation and eradication
- Generation of lead compounds for pre-clinical testing (including studies on pharmacokinetics and pharmacodynamics (PK/PD), toxicity etc ; go beyond 'hit'-identification
- Novel chemical classes (from natural sources or via semi-synthesis)
- Activation of cryptic biosynthetic gene clusters for antibiotics.
- Derivatives of existing (biologically active) molecules which require more than incremental improvement (novelty)
- Structure-based design
- Mode of action studies complementary to drug development

### 2. New Antibacterial Therapies

- Novel concepts or innovative combinations
- Immunotherapy
- Studies on derivatives of existing approaches which require more than incremental improvement (novelty)
- Alternatives to antibiotics (e.g. phage therapy) and new interventions
- Generation of new leads for pre-clinical testing (including studies on pharmacokinetics and pharmacodynamics (PK/PD), toxicity etc ; go beyond 'hit'-identification
- Target development, provided that specific known targets are addressed
- Anti-biofilm therapies
- Host-directed therapies
- Design therapy includes prevention/ counteracting antibiotic resistance
- Screening of novel natural resources; harnessing biodiversity
- Mode of action studies complementary to drug development
- Unconventional approaches not mentioned but with strong potential to lead to solutions to treat infectious diseases

# Appendix 8B: Topics will not be considered within this call for proposals

## Topics that are not considered within this Call for Research Proposals:

*(Applicants who have an interest in these topics are invited to apply for a grant in the NWO Domain TTW Open Technology Programme, which has a similar funding and industrial matching scheme).*

- Proposals with the **sole** aim of:
  - development or improvement of vaccines
  - development or improvement of diagnostic tools
  - development or improvement of enabling technologies
  - development of phage therapy in general (as opposed to: developing a specific phage therapy directed at a specific (type of) infection)
  - fundamental research on vital biological processes in bacteria which may in time identify potential drug targets (e.g. cell division, membrane transporters, protein biosynthesis etc.)
  - identification of potential drug targets without lead compound development, e.g. by library screening for potential drug targets
  - (fundamental) research on 'mode of action' of a potential therapy or drug molecule
- Proposals focusing on:
  - antibiotic resistance (AMR) in the sense of monitoring and/or regulation
  - surveillance of antibiotic use
  - organisms other than bacteria (i.e. fungi, parasites, viruses, insects, crops/plants, pests)
  - development of biocides and disinfectants
  - development of conventional immunomodulatory compounds
  - crop protection
  - veterinary use alone
- 'alternative therapies' as in non-conventional 'alternative medicine', molecules/compounds derived from protected/endangered sources, homeopathy, herbal medicine, complex often undefined mixtures of natural products etc.
- Clinical trials (this will be a topic later in the programme, in collaboration with NADP)

When in doubt if your proposal would fit in the scope of the Programme, we urge you to contact the NWO Domain TTW Programme office well ahead of the deadline for submission.