



Discovery Research Grants Call and guidelines – 2021 scheme

RNID funds research into hearing loss and tinnitus to speed up the discovery and development of new medical treatments to protect and restore hearing and silence tinnitus.

Our Discovery Research Grants support projects that will generate knowledge to underpin the discovery of treatments for hearing loss or tinnitus, or improve how new treatments are developed and tested.

This year, we are also co-funding research in two areas:

- We are working with the Cystic Fibrosis Trust to co-fund research that will lead to new ways to protect hearing from the ototoxic side-effects of aminoglycoside antibiotics, and
- We are continuing our partnership with Alzheimer's Research UK to co-fund research that will increase our understanding of the common biological mechanisms underlying hearing loss and dementia.

1. Background

Why encouraging research to protect hearing from ototoxic aminoglycoside antibiotics is important

Aminoglycosides are a class of broad-spectrum, life-saving antibiotics, and often the only effective treatment for a number of multi-drug resistant bacterial infections. However, they are also both ototoxic (with irreversible effects) and nephrotoxic (with reversible effects). Aminoglycosides damage sensory hair cells in the cochlea of the ear. Damage to these cells causes permanent hearing loss, as these cells cannot be regenerated.

This limits the use of aminoglycosides in the UK and other high-income countries to the treatment of severe infections that do not respond to other antibiotic treatment, such as to treat chronic *Pseudomonas aeruginosa* infections often seen in people with cystic fibrosis. They are also used prophylactically to protect premature babies who require intensive care. However, they are used more widely in lower- and middle-income countries, as they are cheap and effective against a wide range of bacterial infections.

However, the resulting hearing loss is a significant burden on these populations. Around 10% of people who are treated with aminoglycosides will develop permanent and often severe hearing loss, with the risk and the severity of hearing loss increasing with the duration and repetition of treatment. There are also known genetic risk factors that increase an individual's risk of developing hearing loss if treated with these drugs.

It is therefore crucial to find effective ways to protect hearing from the ototoxic side effects of these medicines, so they can be used safely without causing permanent hearing loss.

Why encouraging research into common mechanisms underlying hearing loss and dementia is important

In recent years, increasing evidence has suggested a link between dementia and hearing loss. There is strong evidence that mild hearing loss doubles the risk of a person developing dementia, with moderate hearing loss leading to three times the risk, and severe hearing loss five times the risk. Hearing loss can be misdiagnosed as dementia, or make the symptoms of dementia appear worse.

People with dementia may have difficulty communicating with others, or have difficulty in processing what they hear, particularly if there are distractions, such as background noise. This difficulty in processing information (when there is competing information, whether auditory or otherwise) may be one of the first signs of cognitive impairment.

Further evidence shows an association between hearing loss and decline in memory skills. More research is therefore needed to clarify whether proper

diagnosis and management of hearing loss, including provision of hearing aids, may reduce the risk and impact of dementia.

In addition, little is understood about the link between dementia and hearing loss, and the processes underlying both conditions. It is therefore important to investigate these processes in more detail, to determine how the conditions are linked, whether via common pathological processes, by common functions or both, and how they impact upon each other. This will be important in developing interventions that can delay or prevent the progression of both dementia and hearing loss.

2. Call for Proposals

We request research projects in the following areas:

1) Research to understand the links between dementia and hearing loss

Original research that will:

- identify common biological mechanisms that underlie dementia and hearing loss, and how they lead to both conditions
- advance our knowledge of any causal link between hearing loss and dementia
- lead to the development of interventions that can delay or prevent the progression of both conditions, or prevent one condition from exacerbating the other

Projects submitted under this category will be considered for joint funding with Alzheimer's Research UK.

2) Research to underpin the development of treatments for hearing disorders, including tinnitus

Any research that underpins the development of treatments, including but not limited to medical devices, pharmacological treatments, genetic or cellular therapies, will be considered under this category.

Treatments should aim to prevent hearing loss, restore auditory function or silence tinnitus.

Research proposals that underpin the development of treatments to protect hearing from aminoglycoside antibiotics will be considered for joint funding with the Cystic Fibrosis Trust.

Examples of research topics included in this category:

- identifying the causes of hearing loss, including central auditory processing disorders
- improving understanding of the molecular and/or cellular changes associated with different types of hearing disorders
- improving the interface between a cochlear implant and the auditory nerve
- catalysing the development of novel medical devices to aid or restore auditory function
- contributing towards the development of therapies to prevent loss of auditory function
- identifying biological pathways that could be targeted to trigger the regeneration of damaged cell types in the auditory system
- advancing drug or gene-based approaches to restore hearing function or trigger cell regeneration
- advancing cell-based therapies to repair damage to the auditory system
- identifying the causes of tinnitus
- improving understanding of the biological basis of tinnitus
- contributing towards the development of treatments to silence or alleviate tinnitus

3) Research to improve how new treatments for hearing loss and tinnitus are developed and tested

Any research that improves how new treatments are developed or tested is encouraged under this category.

Research proposals to improve how new treatments to protect hearing from aminoglycoside antibiotics are developed and tested will be considered for joint funding with the Cystic Fibrosis Trust.

Improving measurement of auditory function or tinnitus

Research to improve how hearing or tinnitus is measured or monitored:

- to improve diagnosis or prognosis
- to identify the type and location of damage underlying a person's hearing difficulty or tinnitus
- to provide new and robust measures for use as clinical trial endpoints to evaluate interventions
- to allow for patient stratification into clinical trials
- to help select the most appropriate treatment

Such measures include, but are not limited to, genetic, physiological, or behavioural approaches.

Developing models of human hearing disorders, including tinnitus

Research to develop models of human hearing disorders, including tinnitus, to allow for robust pre-clinical validation of treatments:

- *in vivo* animal models
- *in vitro* animal or human cellular models
- computer models of human hearing loss or tinnitus

Additional notes for applicants

- Please note that you may only submit **one** preliminary application as the lead applicant. You may be named as a co-applicant or collaborator on other applications.
- We particularly encourage applications in the area of medical devices, as they are currently under-represented in our portfolio.
- Projects must be defined pieces of research with clearly stated objectives, experimental plan and expected outcomes. Applications to cover solely, or mainly, equipment costs, will **not** be accepted.
- Projects should be able to demonstrate a route by which outcomes could be exploited for the benefit of people with hearing loss or tinnitus, and, where relevant, people with cystic fibrosis or dementia.
- The joint initiative between RNID and the Cystic Fibrosis Trust seeks to encourage and support research to prevent aminoglycoside-induced hearing loss, so improving the quality of life for people with cystic fibrosis and others treated with these life-saving antibiotics. Eligible projects may be focused on understanding the mechanisms by which aminoglycosides damage hearing, finding ways to reduce their damaging effects, improving

the diagnosis of this type of hearing loss or evaluating otoprotective strategies.

- **Please note that we do not fund social research, or research focussed on the design or evaluation of healthcare services.**

Summary of grant:

Duration:	Up to 3 years.
Eligibility:	Applicants can be from any university or research institute in any country
Value:	Up to £200K in total, funding will not exceed £67K in any one year

Application procedure:

There is a two-stage application process for the Discovery Research Grant (an overview of the process, and timings, is shown overleaf):

- 1. Preliminary application** – All applicants are required to submit a preliminary application. Preliminary applications will be considered by our Discovery Research Grant review panel¹, who will rank them, and identify the best proposals to take forward to the full application stage.
- 2. Full application** - Successful applicants will be invited to submit a full application. This application will be subject to external peer review, and final consideration by our Discovery Research Grant review panel. Applicants will be given the opportunity to respond to external peer review feedback in advance of the final review panel meeting.

Preliminary application forms can be downloaded from our website. There is an accompanying guidance document to help with completing the form – **please download it and read it carefully** before completing your application form.

The process of selecting preliminary applications to move forward to the full application stage is very competitive, and we therefore ask that you do not

¹ The Discovery Research Grant review panel is comprised of Professor Abigail Tucker (King's College London) (chair), Professor Doug Hartley (University of Nottingham), Dr Roland Schaette (University College London), Professor Ian Forsythe (University of Leicester), Dr Pdraig Kitterick (University of Nottingham), Professor Cynthia Morton (University of Manchester) and Professor Graham Naylor (University of Nottingham), and 3 additional members to be recruited. In addition, members of the Cystic Fibrosis Trust's Strategic Implementation Board and the Alzheimer's Research UK Grant Review Board will join the panel for the 2021 round of funding to consider applications for co-funding.

submit speculative applications. It is important for this process to work and to be fair to other applicants that preliminary outlines accurately reflect any later invited applications. As such, all full applications will be checked against preliminary applications.

To submit a preliminary application, please email the completed preliminary application form as an **attached MS Word document** with a file name in the format of SurnameApplicant1_DRGPrelim21.doc or .docx e.g. Smith_DRGPrelim21.doc, to:

ProjectGrant@rnid.org.uk

All preliminary applications must be received on or before Thursday 15 April 2021.

For further details:

Telephone: +44(0) 20 3227 6159
Email: ProjectGrant@rnid.org.uk
Web: www.rnid.org.uk/researchfunding

Deadlines

Preliminary applications: 15 April 2021
Full applications: 22 July 2021
Final decision: January 2022

A summary of our current terms and conditions is included on our website for your reference – please note that these are subject to change.

2021 round

