Radical Medicine: Redefining Oxidative Stress

Fact Sheet

Objective

Oxidative stress, an excess of radical and other reactive oxygen species (ROS), has been suggested as a major disease mechanism. However, the major clinical trials using anti-oxidants have been failures, even suggesting serious side effects. Here, I propose completely different approaches: First, instead of letting radicals form and then scavenge them we will identify their diseases-relevant sources and prevent their formation or specifically repair the damage caused by ROS. Second, we will differentiate beneficial signalling roles of ROS. In combination, this will result in unprecedented precision and molecular specificity. In 2010, I submitted a somewhat
related proposal to the ERC and received a comment as being “too focused on essential hypertension”. This proposal has a much broader focus and impact beyond cardiovascular diseases. In the past months we achieved major breakthroughs by identifying a radical/ROS source (NOX4) as fundamental mechanism in stroke, the fastest growing and soon no 1 cause of death. We are also developing in phase II a radical formation inhibitor for neurotrauma. Moreover, our basic research facilitated the development of drug classes re-activating an oxidatively damaged signalling receptor, now in phase III. Further, we identified angiogenesis as a radical/ROS-dependent and protective (!) signalling event. This proposal is just the beginning: our basic science will open up new fields and leap forward in personalized medicine with groundbreaking technologies and approaches. We will contribute to the diagnosis and early identification of patients at risk and to monitor their successful treatment (in vitro/blood-based); to the localization of disease processes (in vivo/molecular imaging) before the onset of symptoms; and to a new generation of more effective, predictable, and mechanism-based drugs. We also expect to later apply our findings and tools to neurobiology and oncology, where ROS also play physiological and pathological roles.

Fields of science

natural sciences > biological sciences > neurobiology
medical and health sciences > clinical medicine > cardiology > cardiovascular diseases
medical and health sciences > clinical medicine > oncology
medical and health sciences > health sciences > personalized medicine
medical and health sciences > basic medicine > neurology > stroke

Programme(s)

FP7-IDEAS-ERC - Specific programme: "Ideas" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Topic(s)

ERC-AG-LS7 - ERC Advanced Grant - Diagnostic tools, therapies and public health

Call for proposal
ERC-2011-ADG_20110310

See other projects for this call

Funding Scheme

**ERC-AG - ERC Advanced Grant**

Coordinator

**UNIVERSITEIT MAASTRICHT**

Address

Minderbroedersberg 4
6200 MD Maastricht
Netherlands

Region

Zuid-Nederland > Limburg (NL) > Zuid-Limburg

Activity type

Higher or Secondary Education Establishments

Principal investigator

Harald Horst Heinz Wilhem Schmidt (Prof.)

Administrative Contact

Rob Van Der Zander (Mr.)

Links

Contact the organisation  
Website

EU contribution

No data

Beneficiaries (1)

**UNIVERSITEIT MAASTRICHT**

Netherlands

EU contribution

€ 2 298 000,00
Address
Minderbroedersberg 4
6200 MD Maastricht

Region
Zuid-Nederland > Limburg (NL) > Zuid-Limburg

Activity type
Higher or Secondary Education Establishments

Principal investigator
Harald Horst Heinz Wilhem Schmidt (Prof.)

Administrative Contact
Rob Van Der Zander (Mr.)

Links
Contact the organisation  Website

Other funding
No data

Last update: 2 August 2019

Permalink: https://cordis.europa.eu/project/id/294683

European Union, 2023