

# Novel pharmacological targets for cardiac repair/regeneration: the thyroid hormone alpha 1 (TR $\alpha$ 1) receptor

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Thyroid hormone (TH) is critical for adapting living organisms to environmental stress. Plasma circulating tri-iodothyronine (T3) levels drop in most disease states and are associated with increased oxidative stress. In this context, T3 levels in plasma appear to be an independent determinant for the recovery of cardiac function after myocardial infarction in patients. Thyroid hormone receptor  $\alpha$ 1 (TR $\alpha$ 1) seems to be crucial in this response; TR $\alpha$ 1 accumulates to cell nucleus upon activation of stress induced growth kinase signaling. Furthermore, overexpression of nuclear TR $\alpha$ 1 in cardiomyocytes can result in pathological or physiological growth (dual action) in the absence or presence of its ligand, respectively. Accordingly, inactivation of TR $\alpha$ 1 receptor prevents reactive hypertrophy after myocardial infarction and results in heart failure with increased phospholamban (PLB) expression and marked activation of p38MAPK. In line with this evidence, TH is shown to limit ischemia/reperfusion injury and convert pathologic to physiologic growth after myocardial infarction via TR $\alpha$ 1 receptor. TR $\alpha$ 1 receptor may prove to be a novel pharmacological target for cardiac repair/ regeneration therapies.

## CURRICULUM VITAE

**NAME AND POSITION: CONSTANTINOS PANTOS, ASSOCIATE PROFESSOR OF PHARMACOLOGY AND CARDIOLOGY**

### GRADUATE AND/OR MEDICAL EDUCATION:

**M.D. 1984**, Medical School of Athens, UOA

**PhD. 1991**, Medical School of Athens, UOA

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**1991**, Cardiology

### ACADEMIC APPOINTMENTS:

**2014-** Associate Professor of Pharmacology and Cardiology, Medical School of Athens, UOA

**2009-** Associate Professor of Pharmacology, Medical School of Athens, UOA

**2002-2008**, Assistant Professor of Pharmacology, Medical School of Athens, UOA

**1999-2002**, Lecturer in Pharmacology, Medical School of Athens, UOA

### HOSPITAL APPOINTMENTS:

**2014-** Associate Professor of Cardiology, 3rd Cardiology Dept, Medical School of Athens, UOA

**1992-1999**, Senior Registrar in Invasive and Clinical Cardiology, First Hospital IKA, Athens, GR

**1988- 1992**, Registrar in Cardiology, University College Hospital, London, UK.

## RESEARCH FIELD

- Thyroid hormone and cellular response to stress.
- Thyroid hormone receptor  $\alpha 1$  as a pharmacological target for cardiac repair.

## RESEARCH FUNDING DURING THE PAST YEARS

- European Projects ( PONTE, OPEN-SCIENCE LINK, BioASQ)
- National projects (TREAT-HEART, 09ΣΥΝ-21-965)
- Onassis Foundation
- Funding from Pharma industry (GILEAD Sciences, Fremont, Silicon Valley, USA, MENARINI INTERNATIONAL, SERVIER , SANOFI -AVENTIS)

## SCIENTIFIC SOCIETIES

Member of the Board of the International Society for Heart Research (ISHR, European Section )

## BOOKS

- "Myocardial ischemia : from mechanisms to therapeutic potentials" Cokkinos/Pantos /Heusch /Taegtmeyer (Eds), Springer, 2006

## SELECTED PUBLICATIONS

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