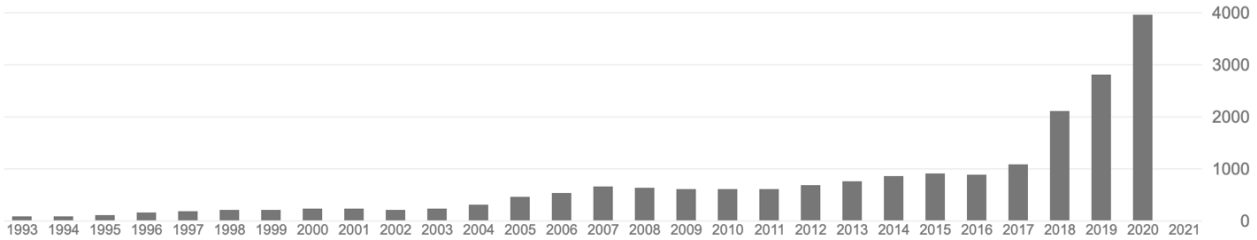
CV Summary of Prof. Ciro Indolfi

Ciro Indolfi is a **full professor of Cardiology**, **Director of the Board in Cardiology** and **Director of the Research Center of Cardiovascular Diseases**, **founder and Director of the Cardiology Institute** of the Magna Graecia University of Catanzaro. His H-index is 63.
In 1984, he was visiting Doctor, at Cardiac Catheterization Laboratory, NIH, Bethesda, MD, U.S.A. From 1986 to 1987 he was a **Research fellow at the Division of Cardiology University of California**, La Jolla, USA, directed by Dr. John Ross Jr. In USA he performed pivotal studies on the flow-function relationship and adrenergic receptors. Then, Prof. Indolfi was an assistant professor at the Federico II University and the Associate Professor at the University Magna Graecia of Catanzaro.
He was **President of the Italian Society of Invasive Cardiology** (**GISE**), and he is the current **President of the Italian Society of Cardiology (SIC)**, He is **Vice-President of FOCE**, Federation of Oncology, Cardiology, and Hematology. He was **director of Department of Medical and Surgical Sciences**, of the Master of II° in Echocardiography of the University Magna Graecia (2018). Director of Master in invasive cardiology (2013). From 2007-2010 he was **President of the Ethical Committee**, University Magna Graecia. He is **Deputy Editor of the Giornale Italiano di Cardiologia**.

Fellow of the American College of Cardiology and of the European Society of Cardiology. **Member of the Committee of European Society of Cardiology on guidelines of percutaneous coronary angioplasty** and of the **Committee of the European Society of Cardiology on Guidelines of Valvular Heart Diseases** and **member of the review process of the 2020 ESC Guidelines** for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation.
Member of the **Committee of the Italian Minister of health for the evaluation of the IRCCS** and of the **pre-clinical studies on medical devices**.

He was Editor of the Italian edition of Cath Sap of the American College of Cardiology. Member of the Board of Minimal Data Setting of the European Cardiology Society. He was the Editor-in-chief and the **founder of "Emodinamica"**, the official Journal of GISE an Editor-in-chief of Acute Cardiac Care.
On April 25, 2006 was honorary awarded by **the President of Italian Republic** with the title of "**Officer of the Italian Republic**" for his scientific achievements.

The research of Prof. Indolfi is documented by 360 peer-reviewed manuscripts published in international journals (including The New England Journal of Medicine, Nature Medicine, Nature Review in Cardiology, Circulation, European Heart Journal, Circulation Research, Journal of Clinical Investigation, Journal of the American College of Cardiology, JAMA Cardiology, American Journal of Cardiology, etc.), by seminars and presentations included invitations at national and international (Europe, Asia, USA) conferences. Prof. Indolfi is in the list of the TIS (top Italian Scientist) and he is reviewer for several international journals such as Circulation, Circulation Research, Nature Medicine, Journal of American College of Cardiology, Basic Research in Cardiology (Editorial Board), Scientific Report (Editorial Board) IHJ, Circulation Journal (Associate Editor), Journal of Clinical Investigation, Giornale Italiano di Cardiologia (Deputy Editor).
His H-index is 63 (google scholar) and the number of citations is 21.139 (see figure, citations/year)



Funding's from National and International Research Projects.

1991-1992 Project leader, Research Project N. CRG910437, founded by NATO, in cooperation with the University of California, San Diego.

1995: Educational Grant of the European Society of Cardiology

1998 Research Project MURST PRIN '98.

1998 Research Project Regione Campania '98 41/94

1999 Research Project Regione Campania (POP) 1999.

2000. Research Project founded by the Minister of Health.

2001 Research Project founded by the Minister of Health.

2001 FIRB

2001 Research Project founded by the Minister of Health.

2001 PRIN (scientific head of the unit).

2003 PRIN (scientific head of the unit) 200330655977_002

2005 PRIN (scientific head of the unit) 2005060509_003

2007 PRIN (scientific head of the unit) 2007WS3JL3

2010 Progetto PON OPTIMA CARDIOPATHS: "Strumenti innovativi per l'ottimizzazione della gestione clinica e la terapia endovascolare delle patologie cardiovascolari", finanziato dal MIUR su base competitiva, nell'ambito del programma di ricerca Horizon 2020

2010 PON CARDIOTECH 01_2833

2011 Progetto CARDIO-APPEAL: "Applicazioni e Processi Innovativi in Cardiologia Endovascolare e Clinica", finanziato dal MIUR su base competitiva, nell'ambito del programma di ricerca Horizon

2011 PON NUTRAFAST 01_01226

2011 PON Progetto di ricerca finalizzata (RF-2011-02318111) intitolato "Inherited arrhythrnias: clinical characterization, genelic geography and experimental studies in the Calabria Region isolale", finanziato su base competitiva dal Ministero della Salute nell'ambito del programma in favore della Ricerca Finalizzata;

2017-2021

Progetto di ricerca di "Fondazione con il SUD" intitolato "A novel plasma medicine tool for accelerated hemostasis".

2020. The European Public Health Program "YOUNG50" - CALL A. In collaboration with the European Community.

Clinical Activities:

Founder and Director of the Cardiovascular Institute Magna Graecia University. **Chief of 12-bed Cardiac Care Unit**, **Director of 3 H/24 cath labs**, **20 cardiological beds and labs of non-invasive procedures**. **Pioneer of primary angioplasty** to treat STEMI patients, prof. Indolfi introduced in the Region procedures of **TAVI**, **Mitra Clip** and **Tricuspid treatments**. Total invasive procedures 40.000. Prof. Indolfi performed the **first procedure in Europe of robotic angioplasty** in January 2020.

Research topics of Ciro Indolfi:

1. Vascular biology. The response to injury, mechanisms of signal transduction from the membrane to the nucleus, and therapeutic molecular strategies.

Coronary angioplasty has radically changed therapeutic strategies in patients with coronary atherosclerosis and has rapidly become the most used revascularization technique in patients with ischemic heart disease. The limit of this procedure was, for over forty years, essentially was linked to the vascular response to the damage induced by the balloon or stent.

The role of smooth muscle cell proliferation and endothelial regeneration in the remodeling process after angioplasty/stenting has been studied in detail *in vitro* and in *in vivo* animal models.

In particular, new animal models of vascular damage have been described the intracellular signaling of arterial smooth muscle cells after vascular damage has been studied. The role of intracellular TK-Ras-RAF-MAPK signaling after vascular damage was studied. The role of the activation of the signal-dependent on the activation of cAMP-PKA was described for the first time *in vitro* and *in vivo*.

The first somatic gene therapy experiments were carried out in our laboratory in 1993, demonstrating the possibility, in the rat model of arterial injury, of using DNA for arterial somatic cells to have a therapeutic effect. Of great interest to the scientific community has been the demonstration that inhibition of smooth muscle cell H-Ras using plasmid DNA reduces cell proliferation *in vivo*. The role of the p85 regulatory subunit was evaluated *in vitro* and *in vivo*, demonstrating that it is possible to obtain a targeted effect even on endothelial cells alone and therefore that the phenomenon of neointimal hyperplasia can be managed not only by acting on smooth muscle cells but also the endothelial cells. Recent studies were aimed at defining the role of microRNAs in neointimal hyperplasia and on endothelial regeneration after balloon injury. In particular, we demonstrated the effect of miR-133 on smooth muscle cells. Finally, we were able to construct an antagomir of miR-92a to selectively stimulate endothelial cells both after vascular damage *in vivo* and cell cultures in healthy animals.

2. Relationship between coronary flow and myocardial function during ischemia.

This series of studies established the fundamental importance of subendocardial flow in determining the level of left ventricular function during myocardial ischemia.

The effects of heart rate manipulation on myocardial flow and left ventricular function were studied in pig and dog at the treadmill in an experimental model in which ENDO / EPI myocardial flow was measured with radioactive microspheres, regional function left ventricle with the implanted micro crystals and left ventricular pressure with a catheter with a micro transducer tip. In particular, in these studies, it was shown for the first time that the beneficial effect of bradycardia on ischemic ventricular function was related to the increase in subendocardial flow per beat, changing the dogma that the beneficial effect of reducing heart rate was exclusively linked to the reduction of the demand for O_2. A family of flow/function curves has been described at various heart rates. It has also been shown that the increase in the subendocardial flow of the left ventricle was associated with a reduction in the total flow of the right ventricle ("reverse right ventricular steal").

These studies have created the conceptual framework for identifying the fundamental mechanisms of myocardial ischemia and for the use of specific pharmacological strategies.

3. The role of the sympathetic system and coronary alpha-adrenergic receptors

The role of the sympathetic nervous system and alpha-adrenergic receptors on coronary flow have been studied in humans. The study of coronary circulation in humans was carried out using the measurement of regional coronary flow with a coronary catheter with a crystal tip for speed measurement. In particular, it has been demonstrated for the first time that alpha-2-adrenergic receptors are present in human coronary arteries and that their stimulation induces a reduction in vessel diameter and coronary flow. Furthermore, in patients with heart failure, unlike what occurs with alpha-1 adrenergic receptors, a down-regulation of alpha-adrenergic receptors has not been demonstrated.

The coronary vasoconstriction effect demonstrated by the selective stimulation of the alpha-adrenergic receptors made it possible to clarify the fundamental mechanisms of angina induced by the increased activity of the sympathetic system (stress, cold, emotion, etc.).