

# A European Society of Cardiology Fit for the Future

**Barbara Casadei, FESC**  
*President Elect of the ESC*

Brno, 06 –09 May, 2018





1918 – **100** Years since Czechoslovakia declared its independence from the Austro-Hungarian Empire



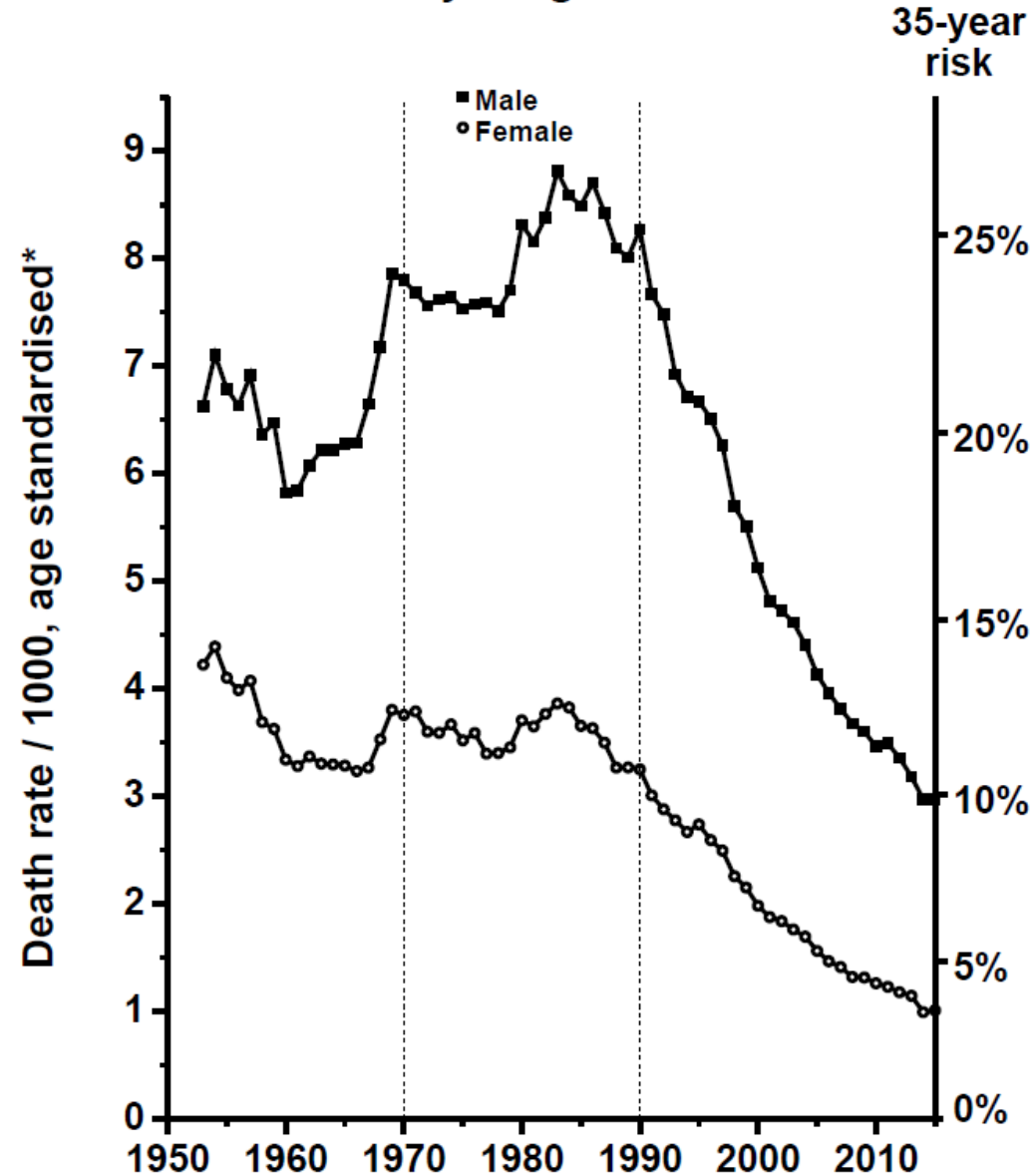
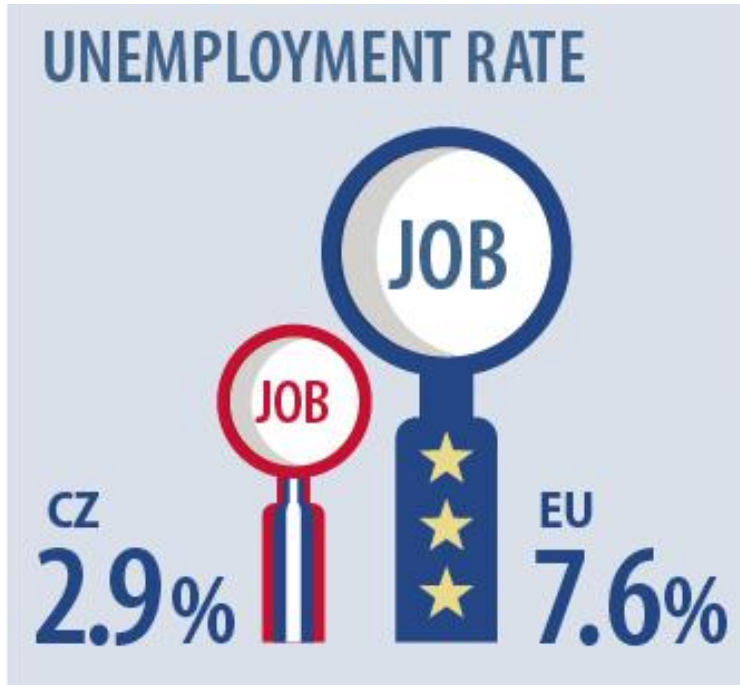
1929 ~**90** Years since Professor Libenský founded your Society



1968 – **50** Years since the Prague Spring

The Czech Republic is the EU Member with the lowest unemployment rate (2.9%), the lowest share of poverty or social exclusion (13.3%), and the lowest number of people reporting current depressive symptoms.

CZECH REPUBLIC 1953–2015: Males & Females  
All vascular mortality at ages 35–69



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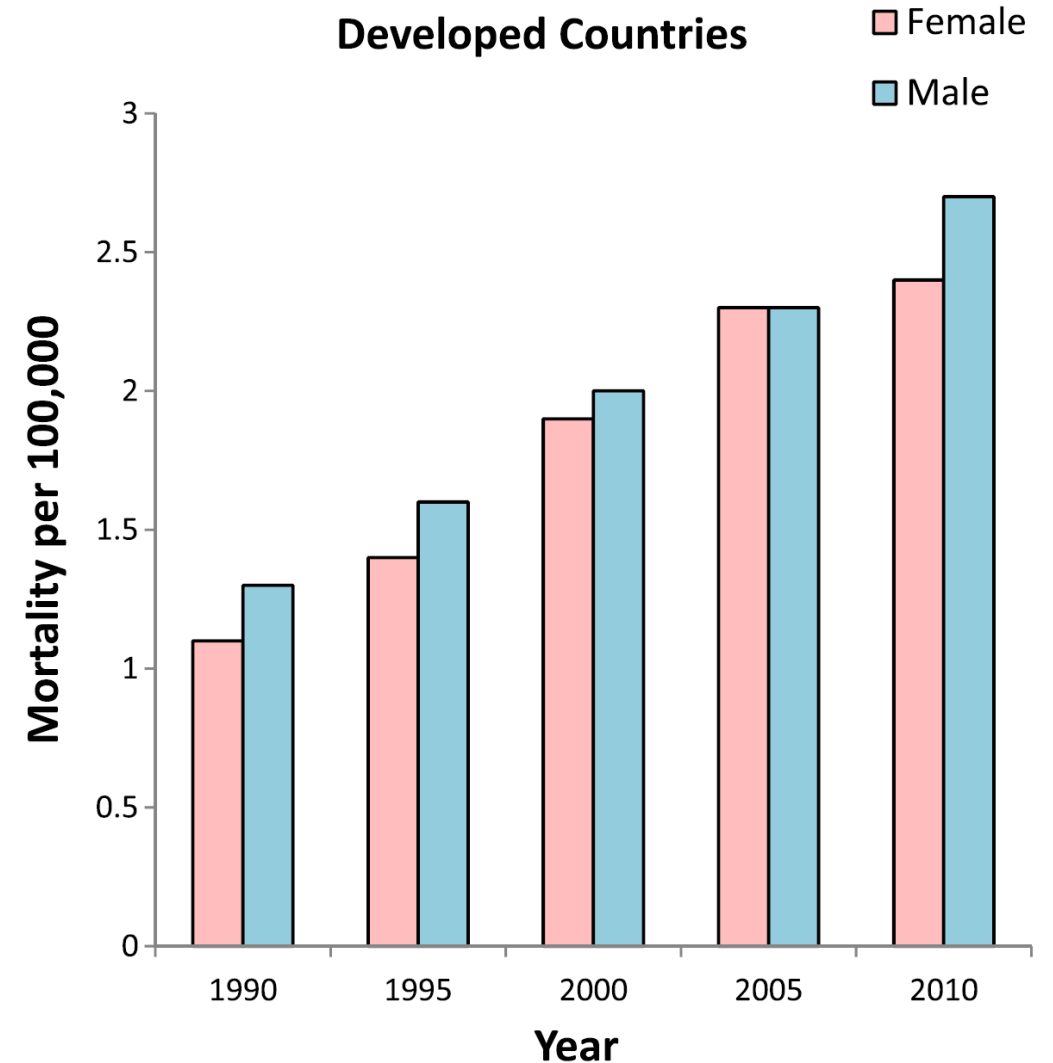
ESC President Elect

\*Mean of annual rates in the seven component 5-year age groups

Source: WHO mortality & UN population estimates

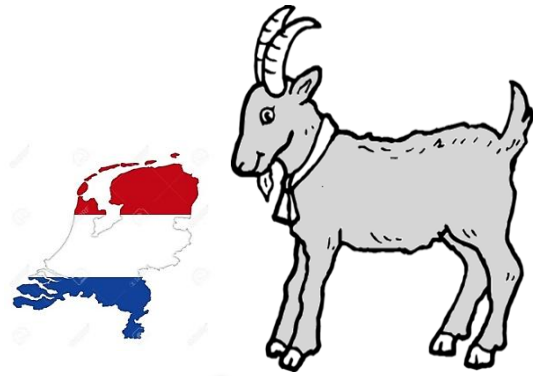
# The Problem with Atrial Fibrillation

- AF is common (>9M in Europe alone) and its **prevalence** is predicted to **double** by 2060
- AF is associated with an **increased risk** of stroke, myocardial infarction, heart failure and premature death
- **Anticoagulation** is the only treatment that has been consistently demonstrated to have a favourable impact on AF prognosis.



## **Hypothesis (I):**

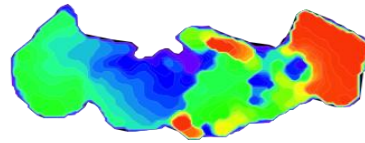
**In humans, atrial fibrillation is always the consequence of an underlying cardiomyopathy**



Clinical Trials

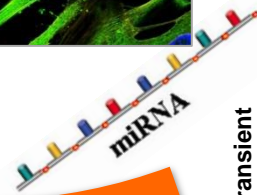
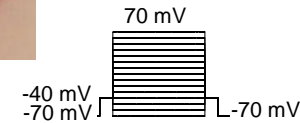
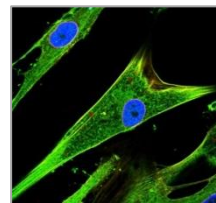
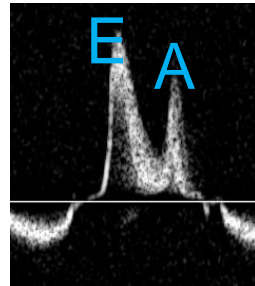
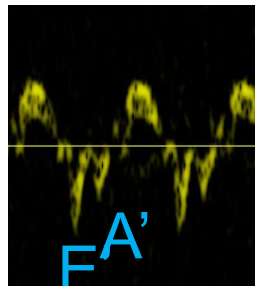
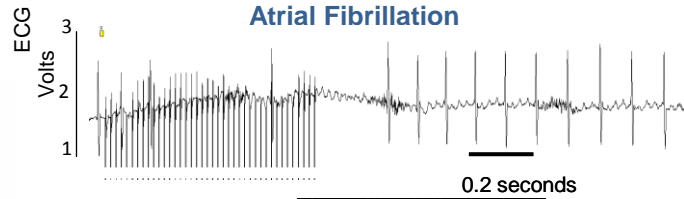
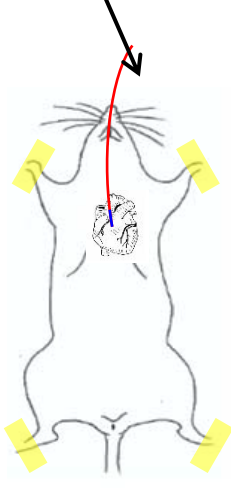


biobank<sup>uk</sup>

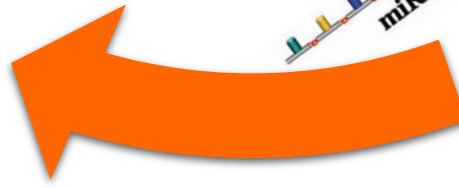
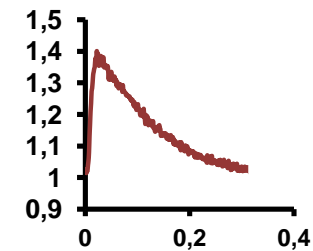


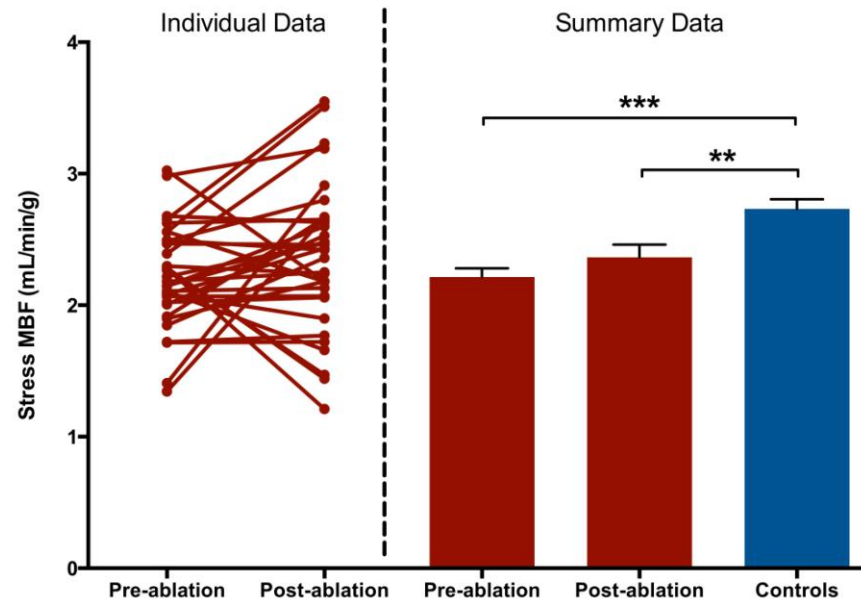
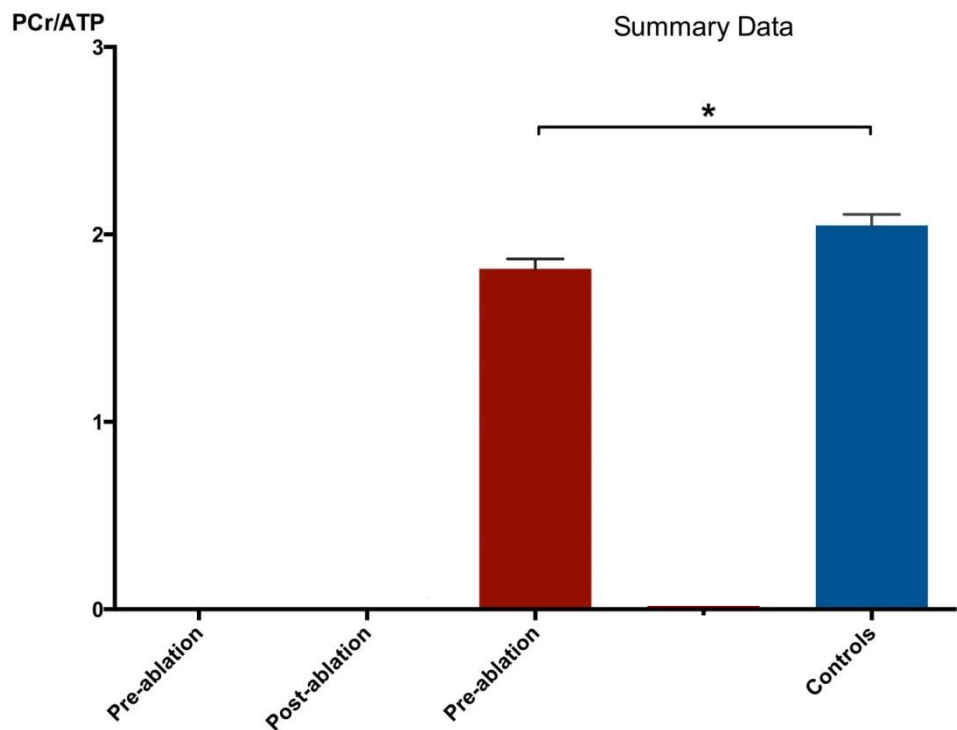
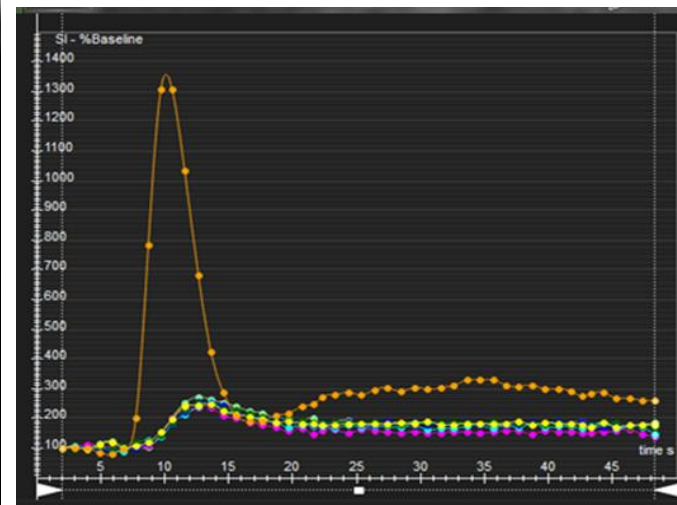
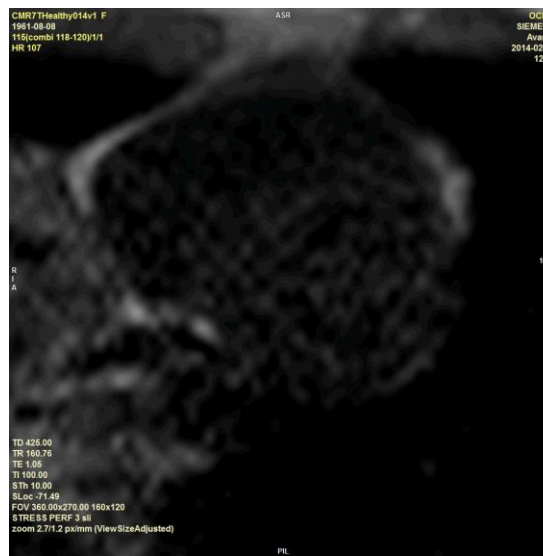
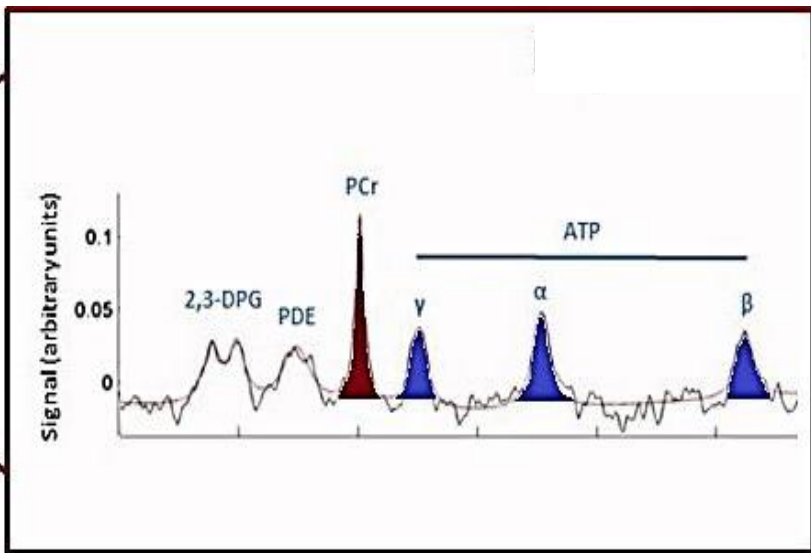
Atrial Fibrillation

octapolar catheter

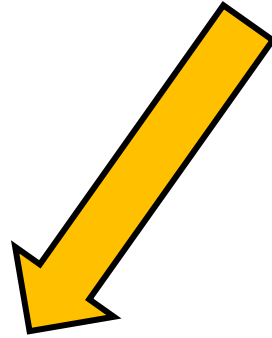


[Ca<sup>2+</sup>] transient (Fura-2 ratio)

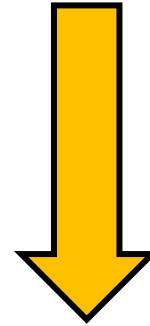
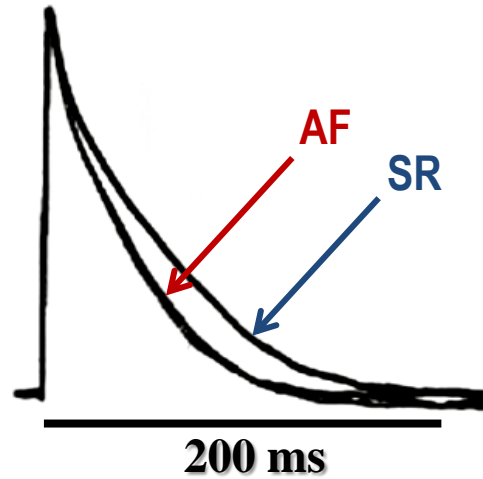




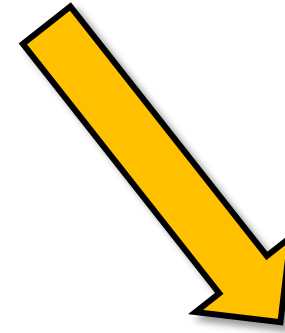
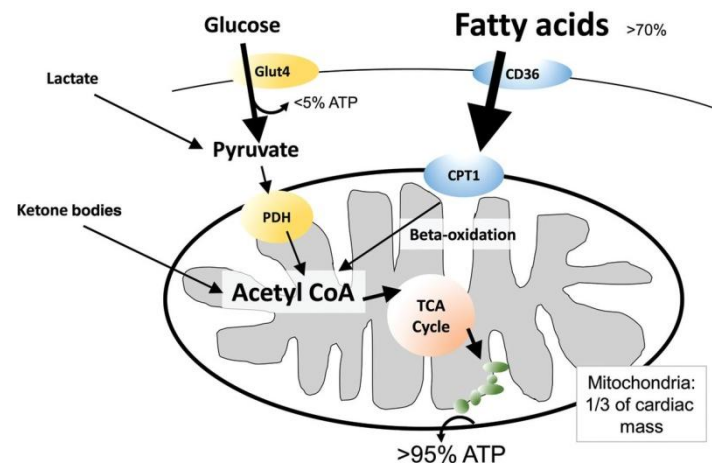
# Nitric Oxide: Reactive Oxygen Species



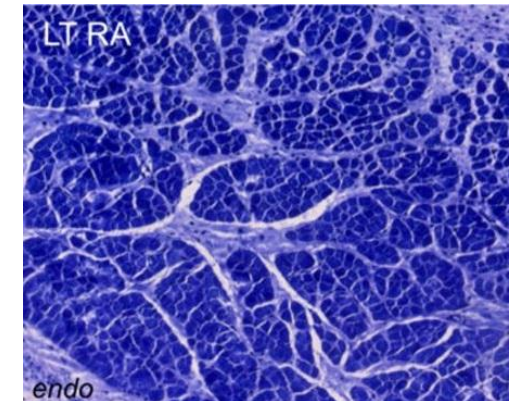
**Electrical remodelling**



**Altered myocardial energetics**



**Structural substrate**

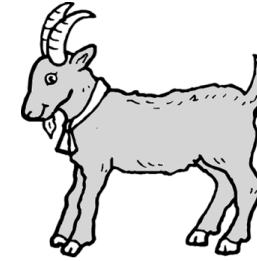




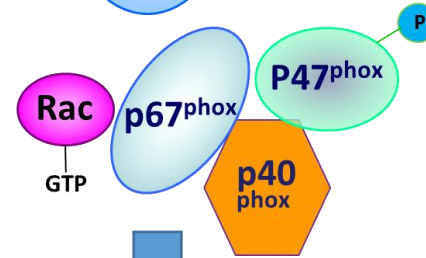
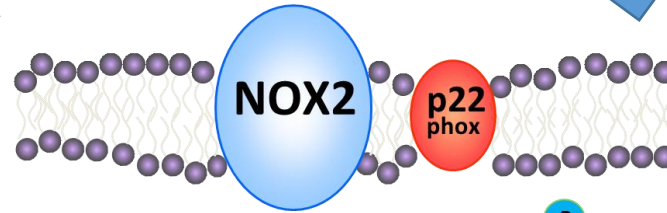
Increased in atrial NOX2 precedes incident AF  
*Kim et al. JACC 2008;*  
*Antoniades et al. JACC 2011*



Atrial NOX2 activity is increased by AF  
*Reilly et al. Circulation 2011*



NOX2 Oxidases are present in human atrial myocytes  
*Kim et al. Circ Res 2008*



Atrial NOX2 overexpression is sufficient to create a substrate for AF. *Mighiu et al*



Perioperative statin therapy does not prevent postoperative AF  
*Zheng et al NEJM 2016*



Statin therapy reduces atrial and vascular NOX2 activity in humans  
*Antoniades et al. Circulation, 2011 & JACC 2012*

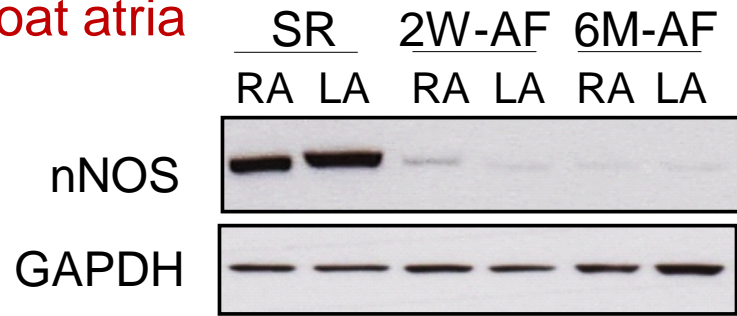


## **Hypothesis (II):**

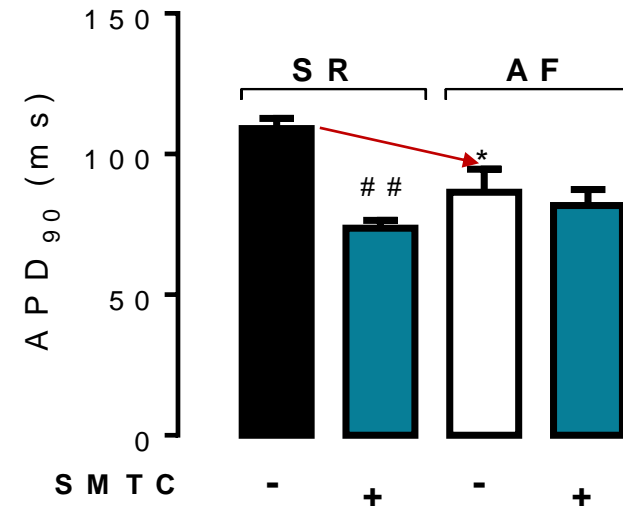
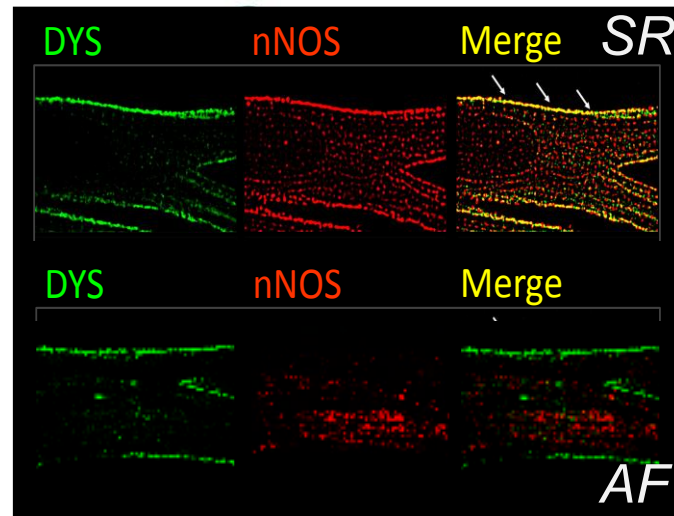
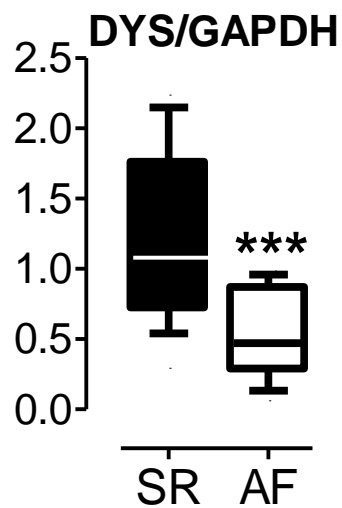
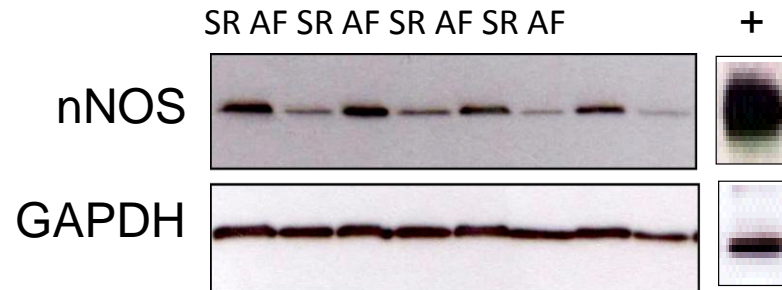
**Once initiated, AF induces a number of electrical and structural changes in the atrial myocardium (remodeling), which hinder recovery of sinus rhythm.**

# Atrial fibrillation is a dystrophinopathy of the atrium

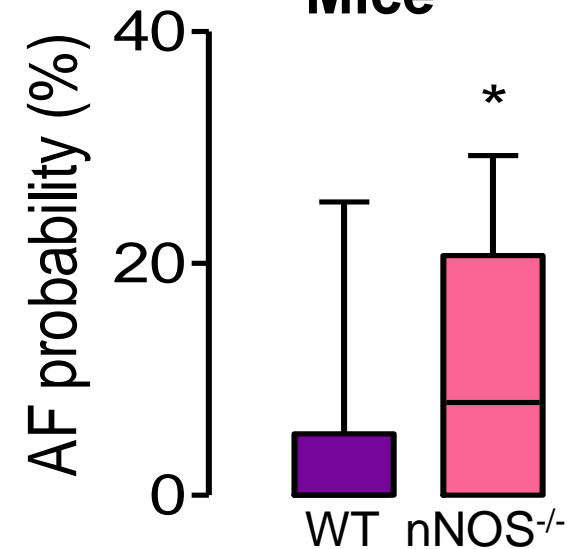
## Goat atria



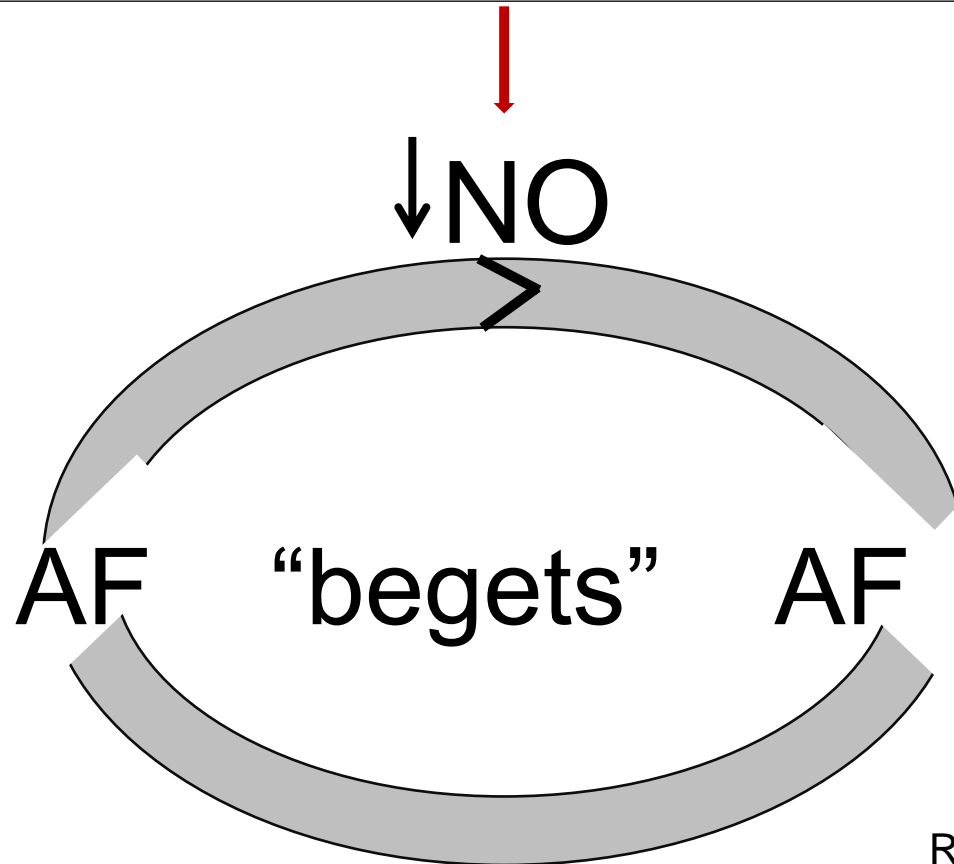
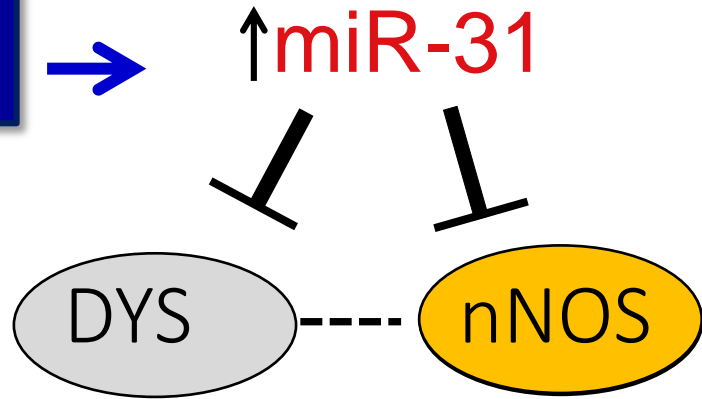
## Human atrial myocytes



## Mice



# Atrial Fibrillation



# To reduce the burden of cardiovascular disease, promote health, and prevent premature death

- Train and educate
- Endorse evidence-based cardiology
- Disseminate knowledge
- *Promote impactful research*
- *Influence health policy & the European regulatory environment*
- *Advocate for patients and professionals*



- Investment in research and training / mobility
- A Dedicated *ESC Council for Patients with CVD*
- Empower Cardiologists to take better control of their *work environment*





**The ESC**  
is here for  
**YOU**

*Barbara Casadei, FESC  
ESC President Elect*