



The Best Tool For Heart Failure Patient Management

產品專員 游騰傑

tsd@healthone-tw.com



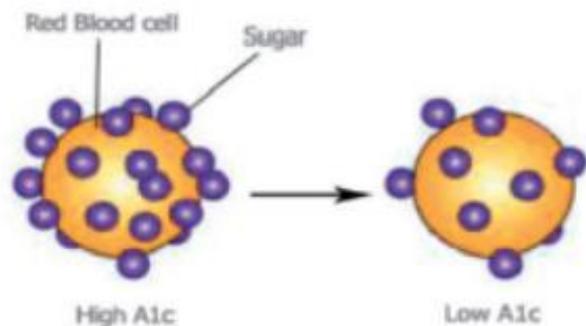


European Heart Journal (2016) 0, 1–9
doi:10.1093/eurheartj/ehw462

CURRENT OPINION

Do we need another heart failure biomarker: focus on soluble suppression of tumorigenicity 2 (sST2)

Alan S. Maisel^{1*} and Salvatore Di Somma²



sST2-The HbA1c of Heart Failure

sST2 as a decoy receptor → when elevated binds IL-33, effectively reducing the concentration of IL-33 that is available to ST2L, thus diminishing the cardioprotective effect of IL-33.

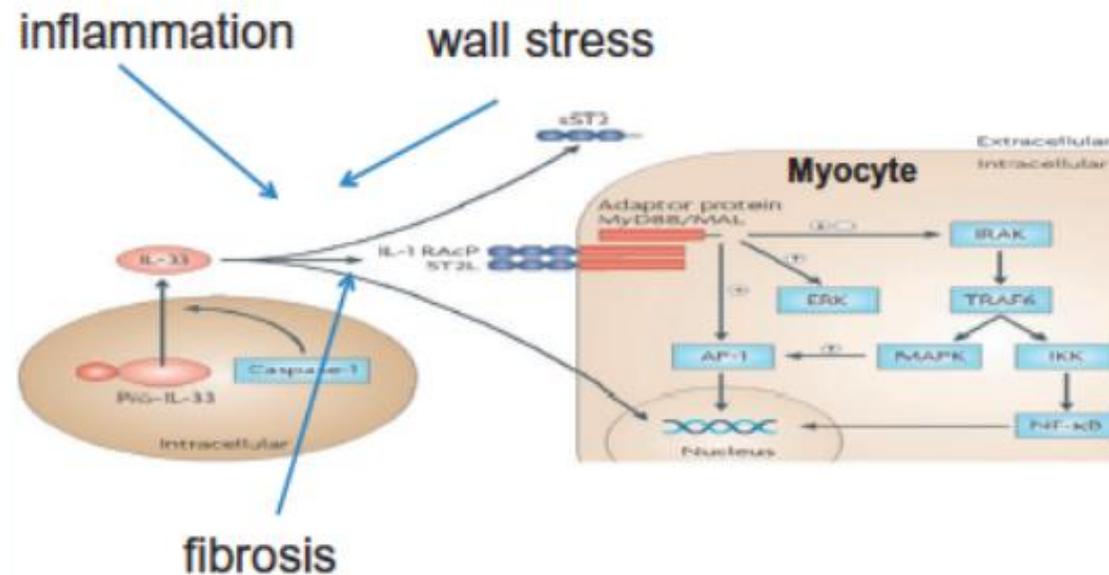


Figure 1 sST2 the HbA1c of heart failure.

Outlines

- **Heart Failure**
- **What is ST2**
- **Heart Failure Management Mode**
- **Presage[®] ST2 Assay Kit**

Heart Failure

What is Heart Failure?

- Heart failure occurs when the heart is unable to pump sufficiently to maintain blood flow to meet the needs of the body

當心臟無法充分提供以血流以滿足身體需要時，就會發生心力衰竭



Heart Failure Classification

ACC/AHA Classification		NYHA Functional Classification	
It introduces four stages of heart failure		This score documents severity of symptoms, and can be used to assess response to treatment.	
Stage A	Patients at high risk for developing HF in the future but no functional or structural heart disorder	Class I	No limitation is experienced in any activities; there are no symptoms from ordinary activities
Stage B	A structural heart disorder but no symptoms at any stage	Class II	Slight, mild limitation of activity; the patient is comfortable at rest or with mild exertion
Stage C	Previous or current symptoms of heart failure in the context of an underlying structural heart problem, but managed with medical treatment.	Class III	Marked limitation of any activity; the patient is comfortable only at rest
Stage D	Advanced disease requiring hospital-based support, a heart transplant or palliative care	Class IV	Any physical activity brings on discomfort and symptoms occur at rest
Hunt SA, et al. (2005) Circulation,112:1825-1852.		Criteria Committee, New York Heart Association (1994) Nomenclature and Criteria for Diagnosis. Diseases of the Heart and Great Vessels. (9th ed.) Little Brown & Co. pp 253–256.	

Heart Failure Development



凝血 疤痕→纖維化→肥大 重塑→心衰竭

Fibrosis:

The formation of excess fibrous connective tissue in an organ or tissue in a reparative or reactive process

纖維化：
在修復或反應過程中在器官或組織中形成過量的纖維結締組織

Remodeling:

Changes of the gene expression resulting in pattern reconstruction in the structure, metabolism and function of the heart

重塑：
基因表達的變化導致心臟的結構，
代謝和功能的模式重建

HF Epidemiology Worldwide

- There are 22.5 million HF patients with the annual rate of increase of 2 million patients, and its 5-year survival rate is similar to that of cancer.

有2250萬HF患者，每年增加200萬患者，其5年生存率與癌症相似。
- 世界衛生統計，2010年

—World Health Statistics, World Health Organization 2010

- Among all diseases, the rehospitalization rate of patients older than 65 is highest in heart failure; 3-6 month readmission rate is 27%-47%.

— Hospital Compare: US Department of Health & Human Services (accessed April, 2013)

在所有疾病中，65歲以上患者的再住院率在心力衰竭中最高；
3-6個月再入院率為27%-47%。

- 醫院比較：美國衛生與人類服務部（2013年4月）

Defects of Current HF Management

- Early diagnosis is not popular
- How to identify the high-risk patients that need aggressive treatment most
- How to adjust or determine drug dose
- No guidelines for hospital discharge
- Hard to monitor discharged patients
- How to know the risk of readmission

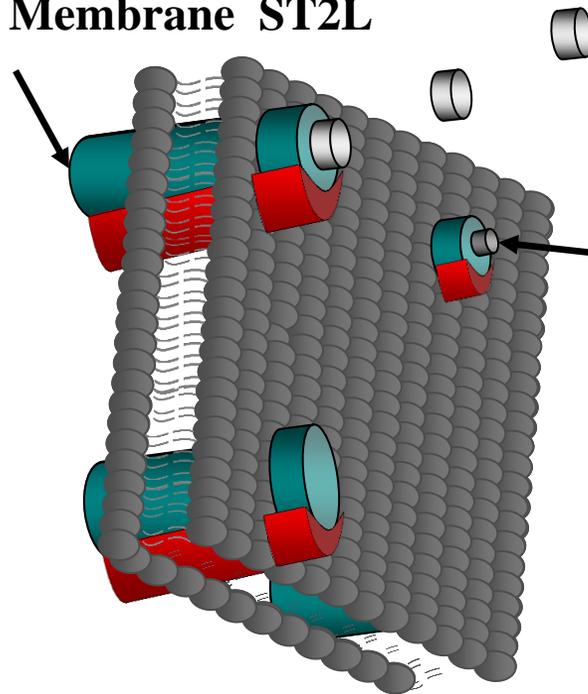
What is ST2

Transmembrane ST2L and Soluble ST2

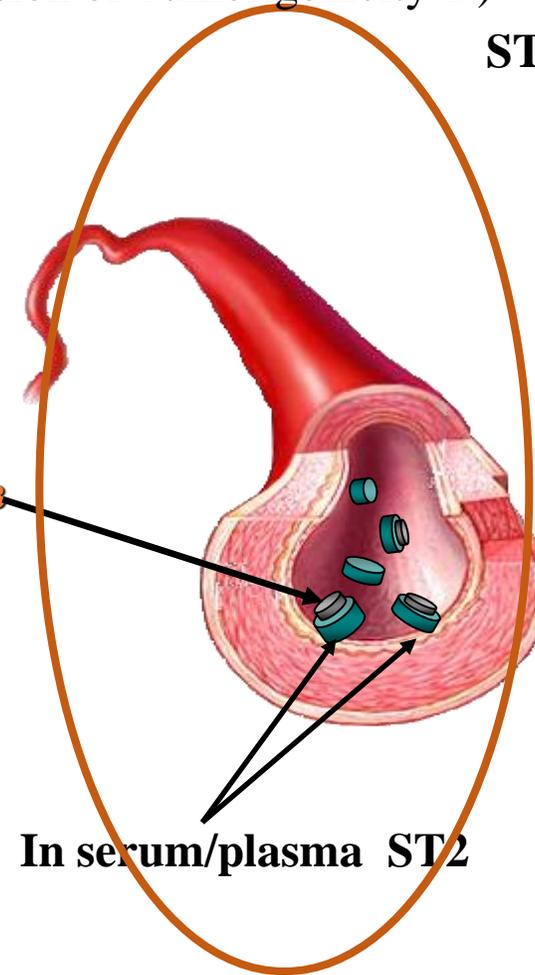
ST2 (growth **ST**imulation expressed gene **2**/ **S**uppression of **T**umorigenicity **2**)

ST2 生長刺激表達基因2蛋白

Cell Membrane ST2L

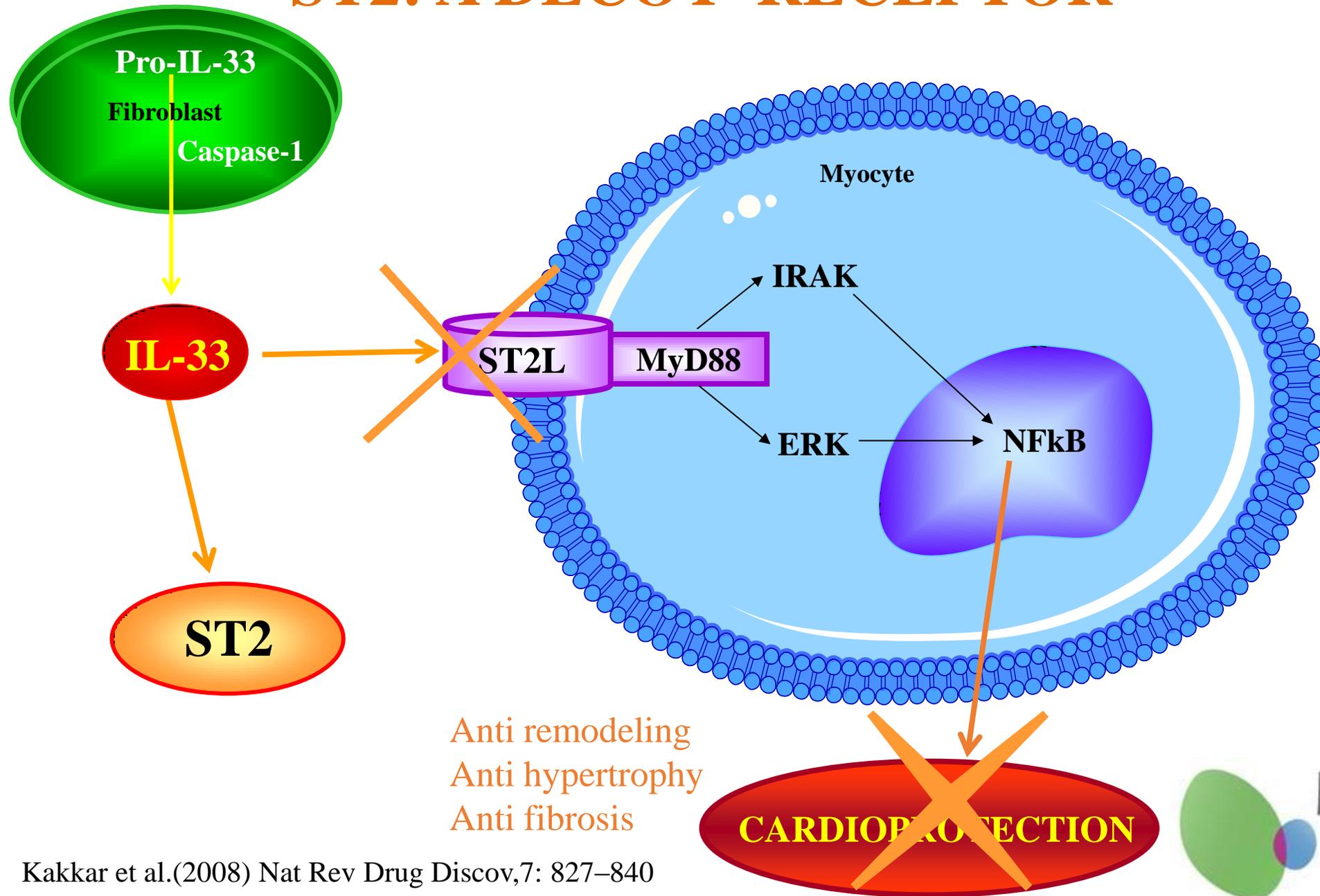


IL-33

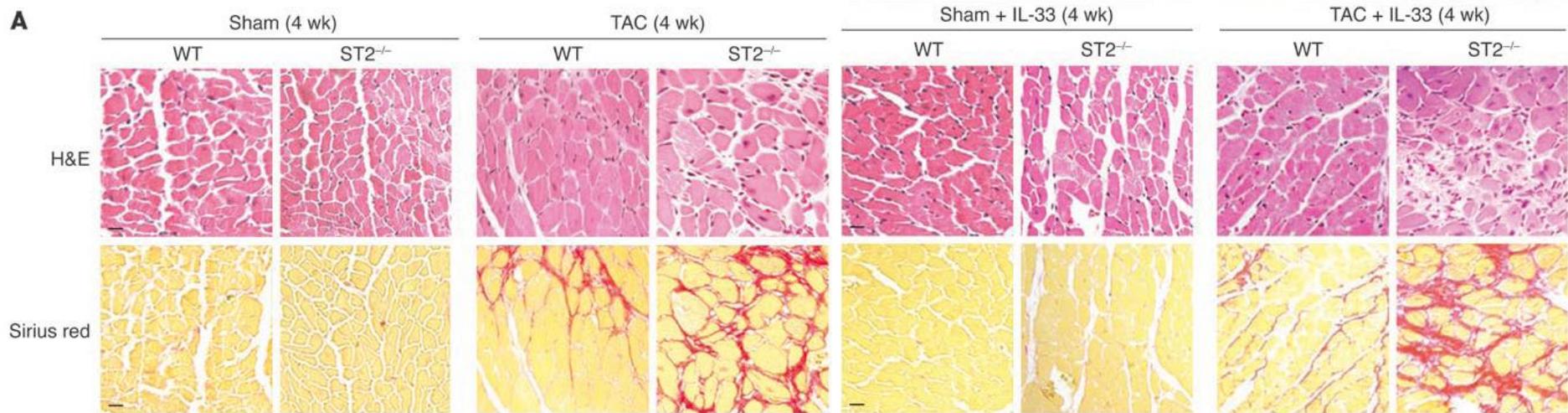


In serum/plasma ST2

ST2: A DECOY RECEPTOR



IL-33 Eliminates Cardiomyocyte Hypertrophy and Fibrosis *in vivo*



Scale bar: 10 μ m

When ST2 is knocked out...
IL-33 turns this...

IL-33 has no effect
...into this...

Sanada et al.(2007) J. Clin. Invest.117:1538-49

Heart Failure Development



ST2 ↑

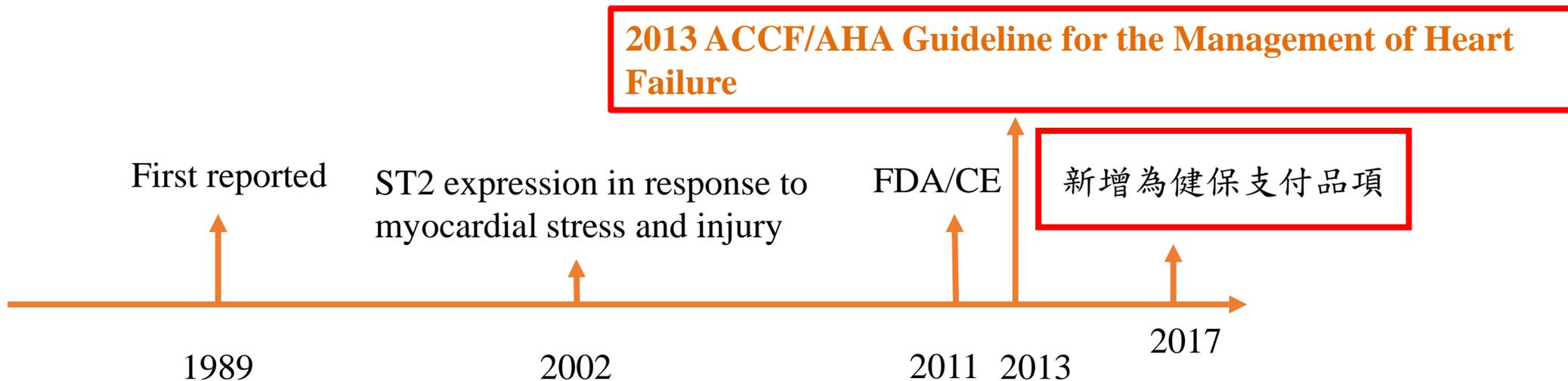
Fibrosis:

The formation of excess fibrous connective tissue in an organ or tissue in a reparative or reactive process

Remodeling:

Changes of the gene expression resulting in pattern reconstruction in the structure, metabolism and function of the heart

ST2



ACCF/AHA Guideline for the Management of Heart Failure

Biomarkers of myocardial fibrosis are predictive of hospitalization and death in patients with HF and also are additive to natriuretic peptide biomarker levels in their prognostic value. A combination of biomarkers may ultimately prove to be more informative than single biomarkers .

When $ST2 > 35\text{ng/mL}$



ST2

- Is
 - a marker of fibrosis and worsening HF
 - prognostic of 30-day rehospitalization
 - NOT adversely impacted by impaired renal function or elevated BMI
腎功能受損或BMI升高不會對此產生不利影響
 - Provides clinically actionable information about response to therapy

S T 2

New generation
HF biomarker

