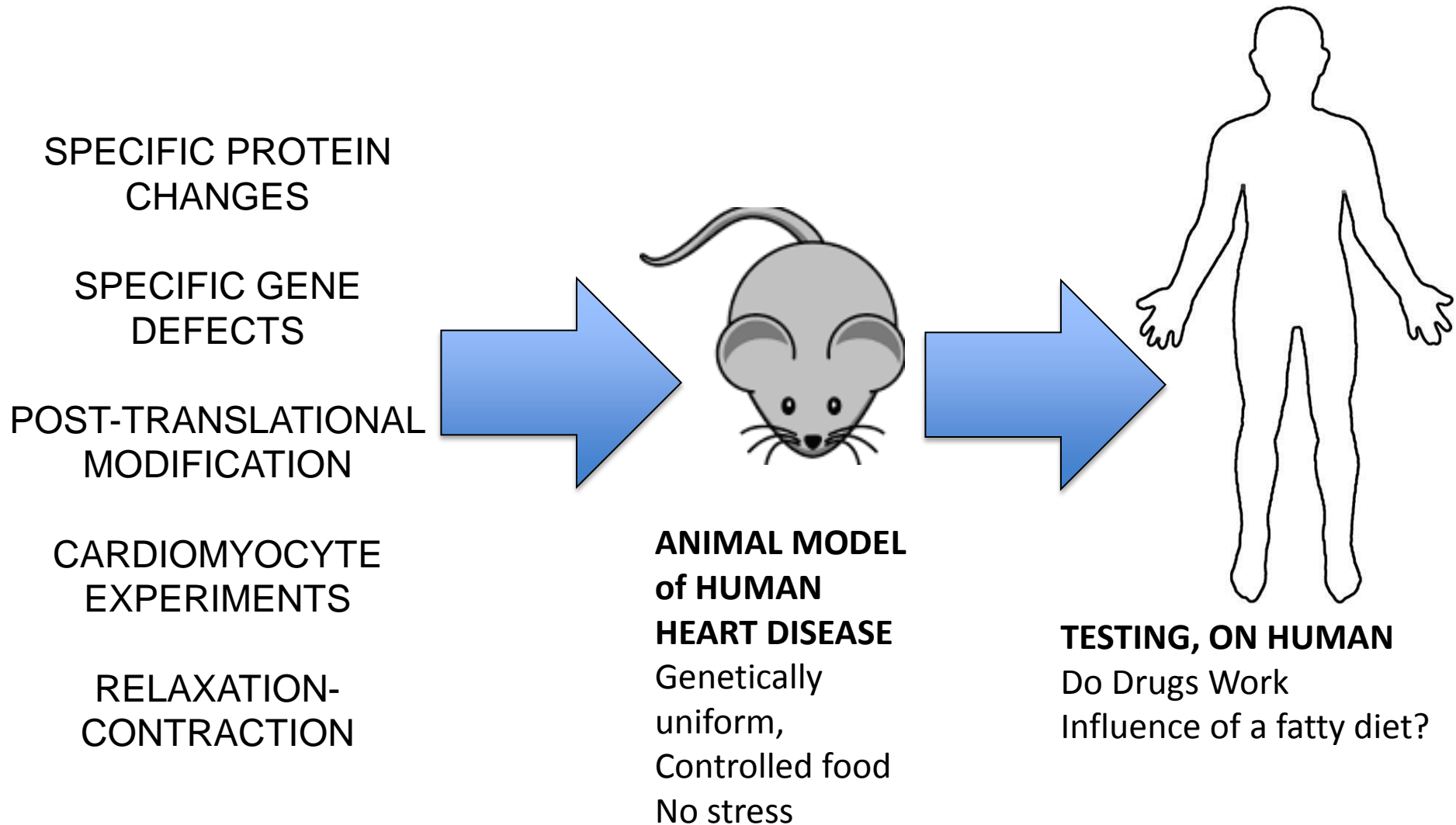


Sydney Heart Bank

A biobanking facility that provides
an alternative to animal in
research

Cris dos Remedios
Director, Sydney Heart Bank
University of Sydney

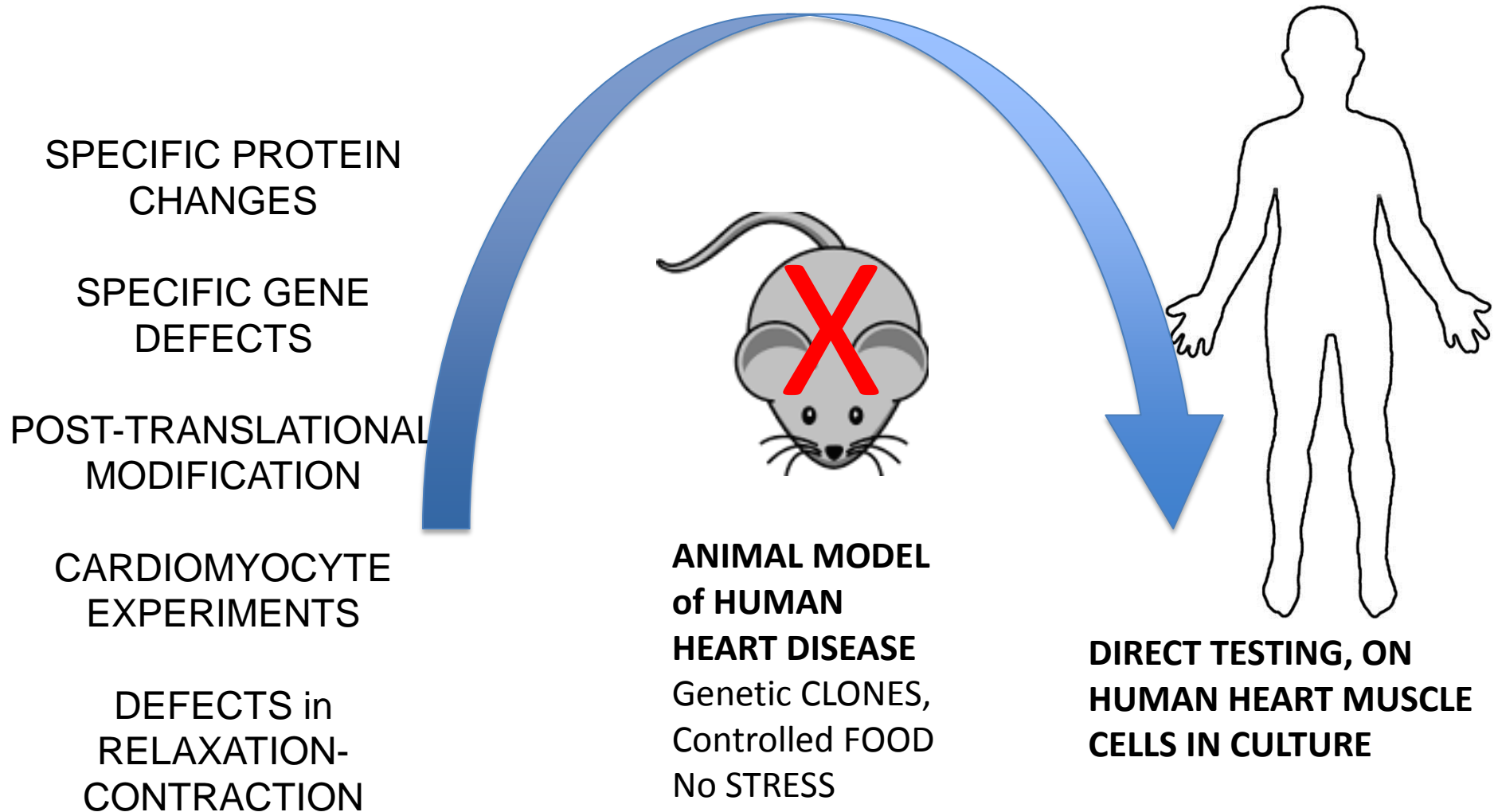
HERE IS THE PROBLEM



WHAT IS WRONG WITH ANIMAL MODELS?

- MOUSE HEART BEAT 800 BPM
- CORONARY CIRCULATION IS DIFFERENT
- DIFFERENT DRUG SENSITIVITIES
- MOUSE MODELS DO NOT REFLECT DRUG METABOLISM
- MOUSE MODELS OF CORONARY DISEASE ARE TOO SIMPLISTIC

HERE IS A SOLUTION



But ... how can we
test of human hearts?
Isn't this ethically
impossible

- The Sydney Heart Bank contains over 16,000 tissue samples from more than 650 human hearts.
- 400 heart are in heart failure and were obtained from the St Vincent's Hospital Heart Transplant Unit.
- >100 hearts are from organ donors where the heart was not able to be transplanted into patients with end-stage heart failure

USA

PD Allen, B Kuhn,
W Pu (**Harvard**)
A Murphy, Jenny Van
Eyck, Ray Winslow,
(**Johns Hopkins U**),
Meredith Bond, Katia
Kontrogianni (**Univ
Maryland**),
Jill Tardiff , S Harris, H
Granzier (**U. Arizona**),
Tom Burghardt, M
Ackerman (**Mayo
Clinic**), K Campbell (**U
Kentucky**), Pepe
Gomez (**U Virginia**), S
Sadayappan (**Loyola U
Chicago**), Bob Horowitz
(**NIH, Bethesda**), J Hall,
D Thomas (**U Minnesota**)
C Moravec (Cleveland **Clin**),
D Warshaw (**U Vermont**)

EUROPE

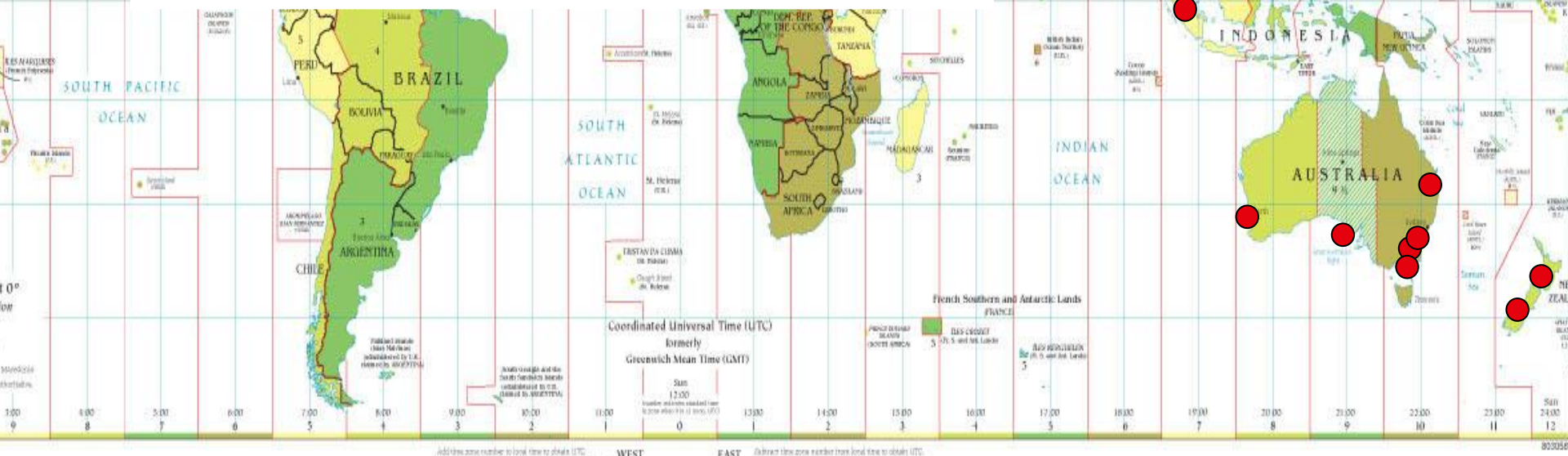
N Hamdani, W. Linke
(**Bochum**)
T Kraft (**Hannover**) , T
Steenman (**Nantes**)
G Stienen, J Van der J
Velden, W Simonides, S
Rain, E Eringa, F De Man, D
Dooijes, D Kuster, C
Bezzina P Wijnkner
(**VU Med Ctr, Amsterdam**)
J. Soni (**U Utrecht**)
S Marston, M Schneider S
Harding (**Imperial London**), J
Kentish, E Ehler, P Bennett,
P Elliott (**King's College
London**), A de Souza, (
P Riley (**Univ Coll London**), M
Dunn (**Dublin**), J Frisén, J
Odeberg, R Knoell
(**Karolinska**), F Ponten (**U
Uppsala**).

ASIA- PACIFIC

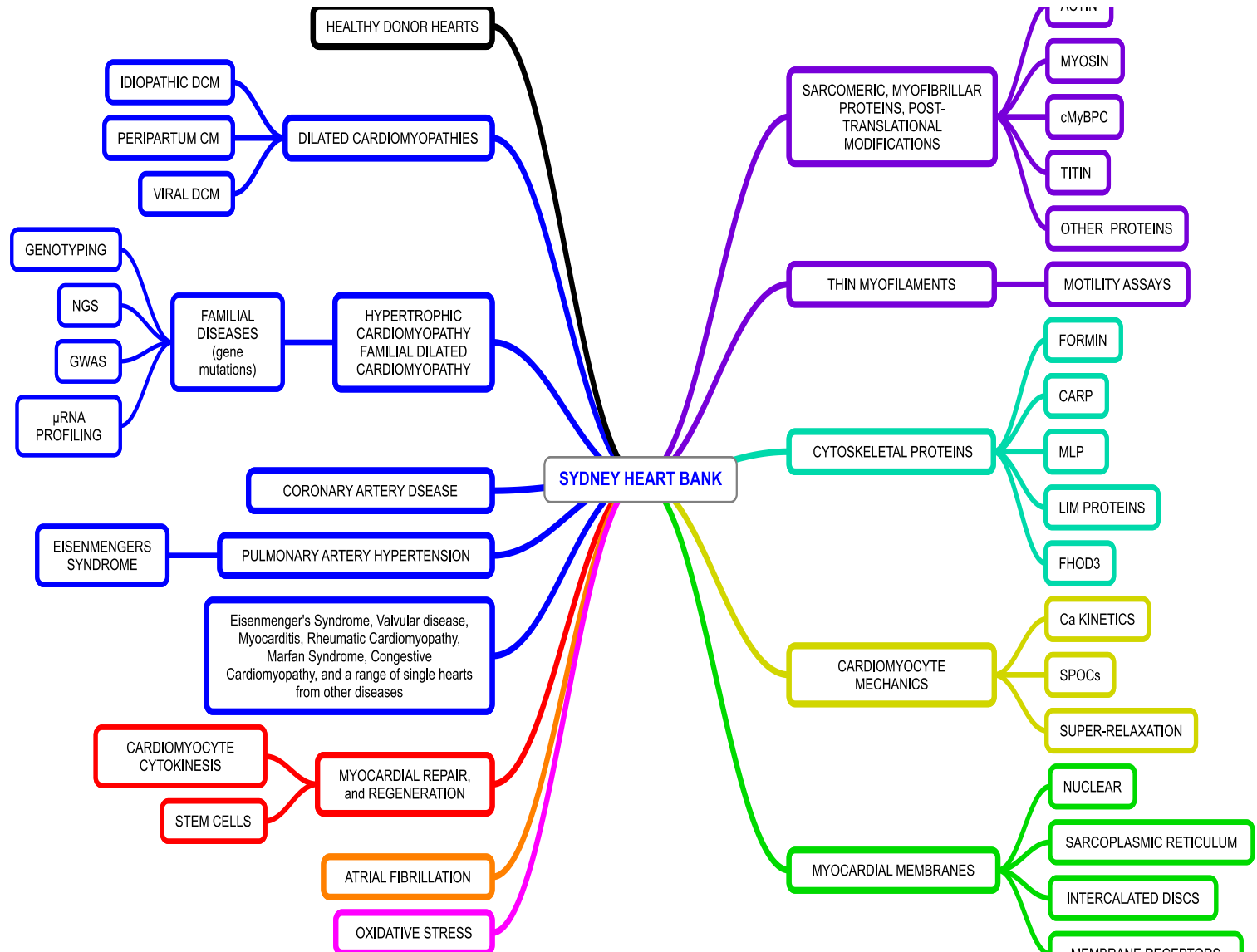
S Ishiwata (**Waseda U**)
N Fukuda (**Jikei U**)
K Yasuda, A Kimura (**Tokyo
Med**), M Ferenczi , W Wang
(**NTU, Singapore**)
C dos Remedios, R Stocker,
B Freedman, KY Ju, D Winlaw,
B Hambly, M Kekic, P Bannon.
J Chong (**U Syd**), B Herbert
(**Macquarie U**), D Saint (**U
Adelaide**), D Kaye, S Pepe
(**Baker IDI**), A Keogh, P
Macdonald (**St Vincent's
Hosp**), D Laver (**U Newcastle**),
E Porrello, W Thomas (**U Qld**)
J Ho (**VCCRI**), S Mihalidou (U
Syd), G Ravenscroft
(**UWA**);



1991-2015: Sydney Heart Bank GLOBAL Active Collaborators

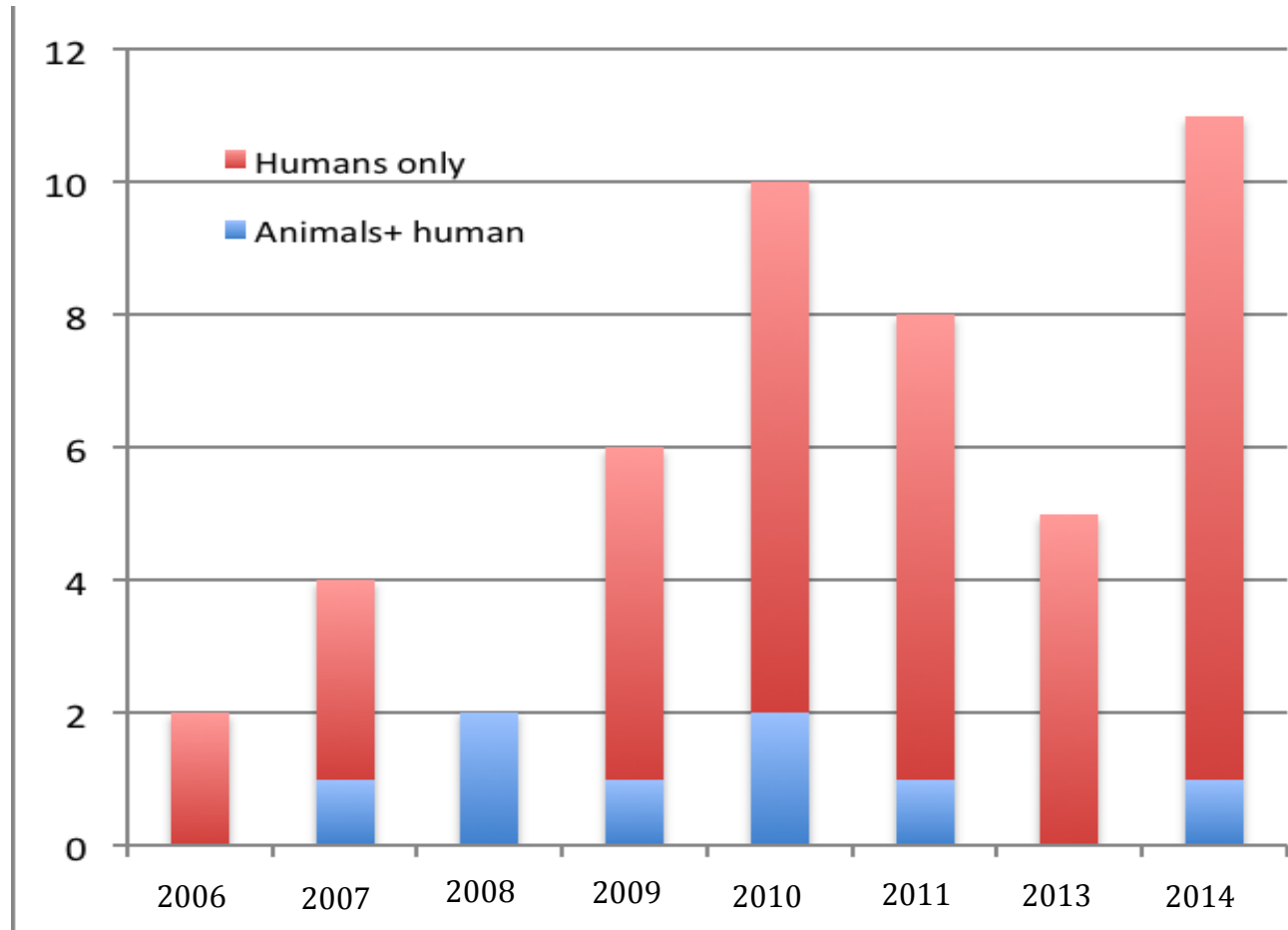


RESEARCH STRATEGIES



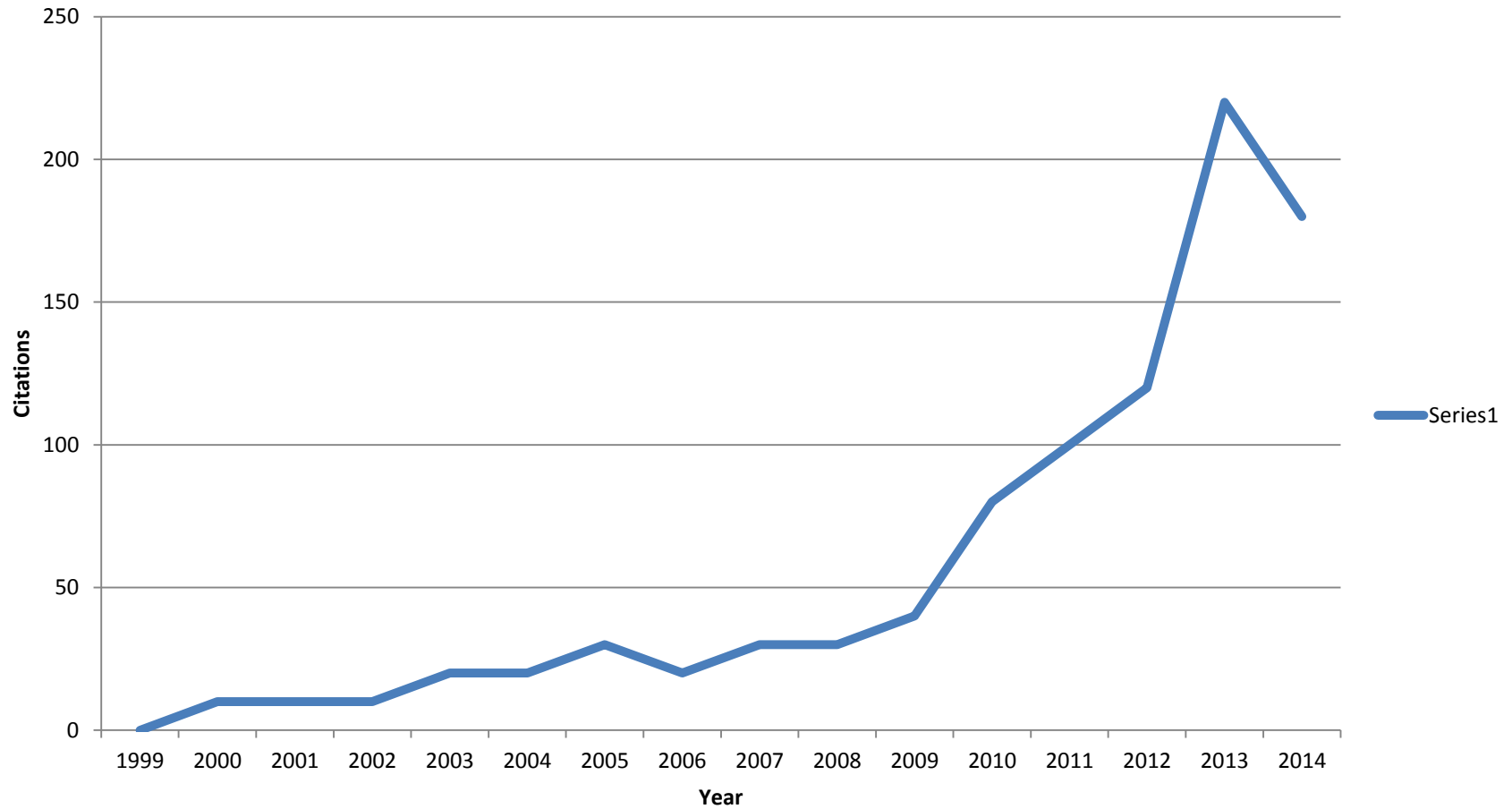
**DOES THIS REDUCE
ANIMAL
EXPERIMENTATION?**

Scientists have to be convinced one-by-one to give up animals and use SHB human heart tissue.
Data from a collaboration with Dr Jolanda van der Velden



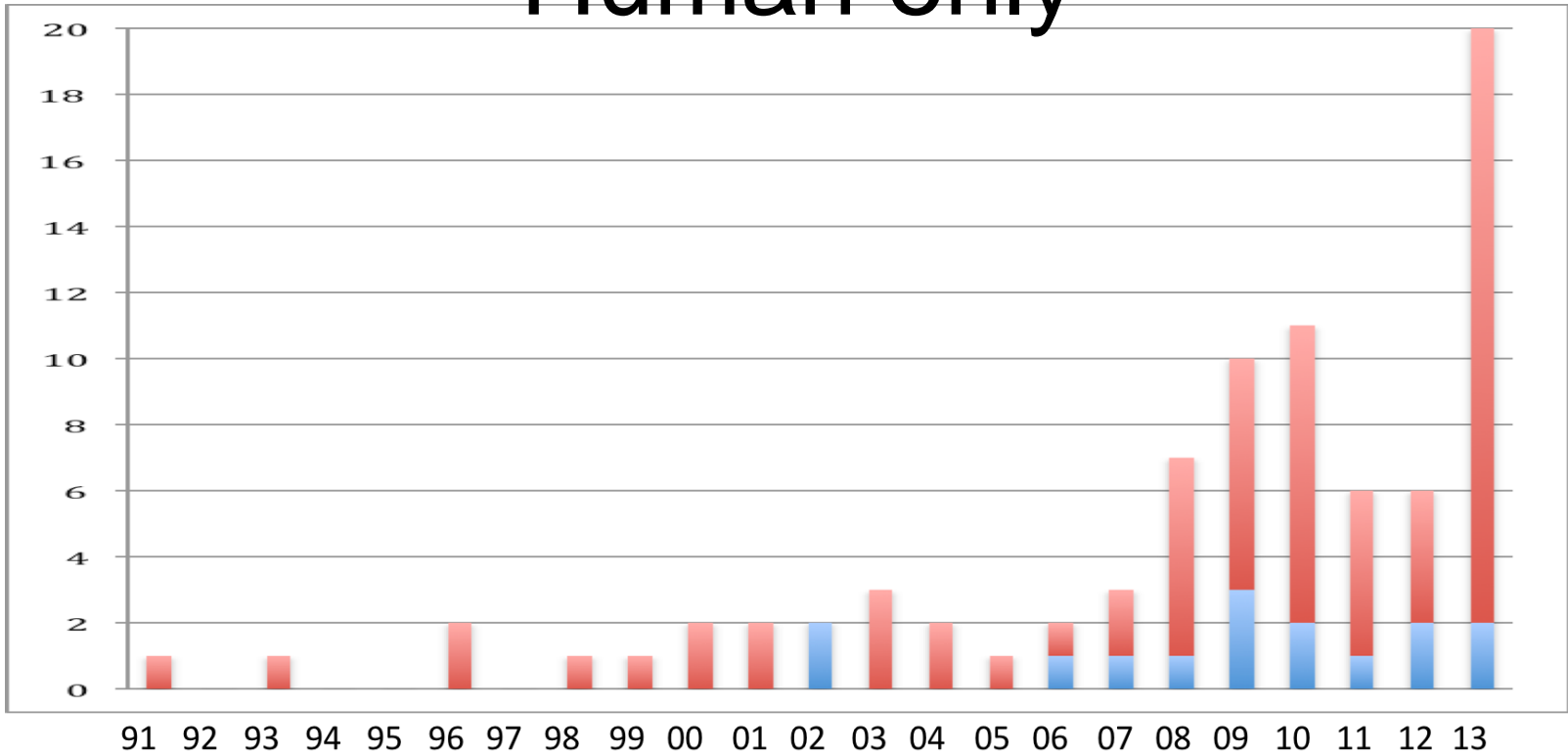
**ARE ANIMAL-FREE
STRATEGIES
SUCCESSFUL?**

The Sydney Heart Bank SCIENTIFIC OUTPUT



Animal + human

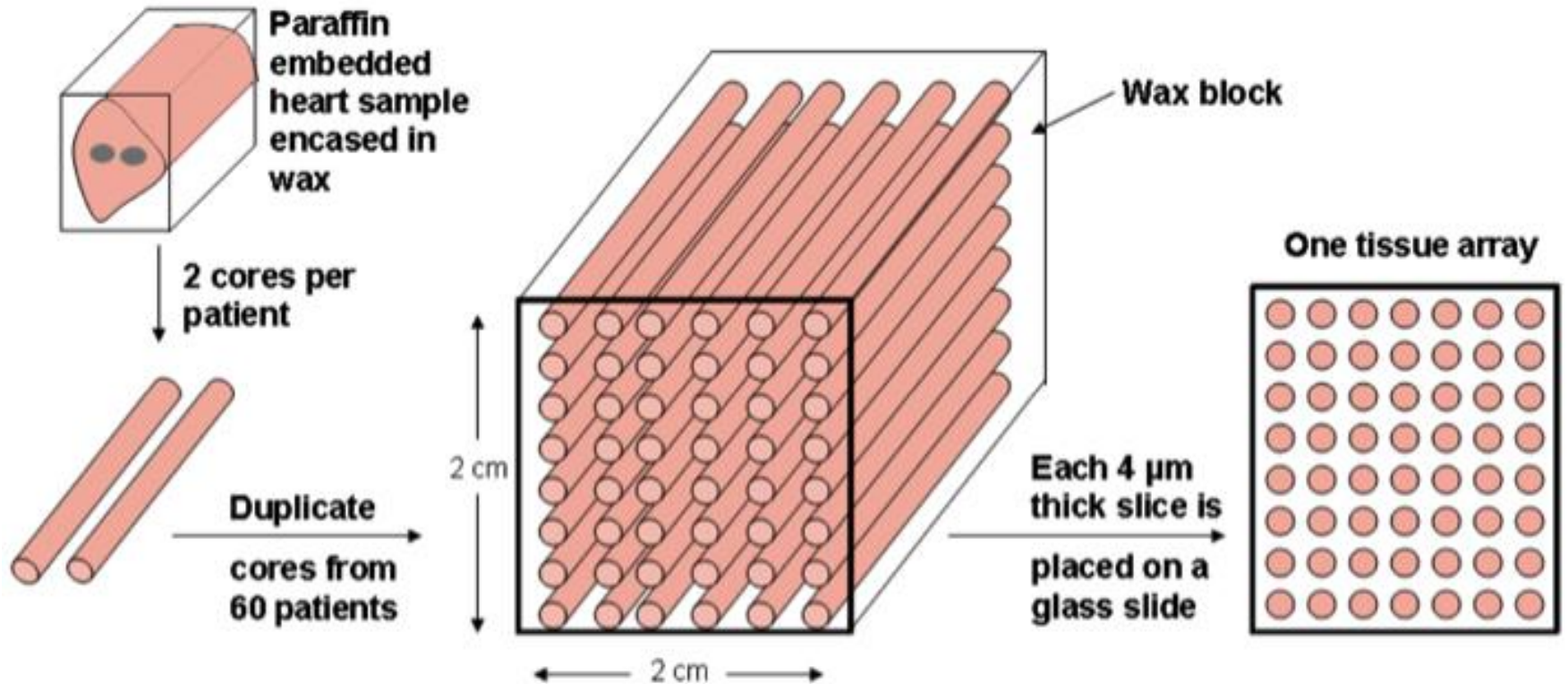
Human only



Plot of the number of scientific papers published by the SHB per year using (**RED**) only human tissue, and (**BLUE**) both animal experiments and human tissue

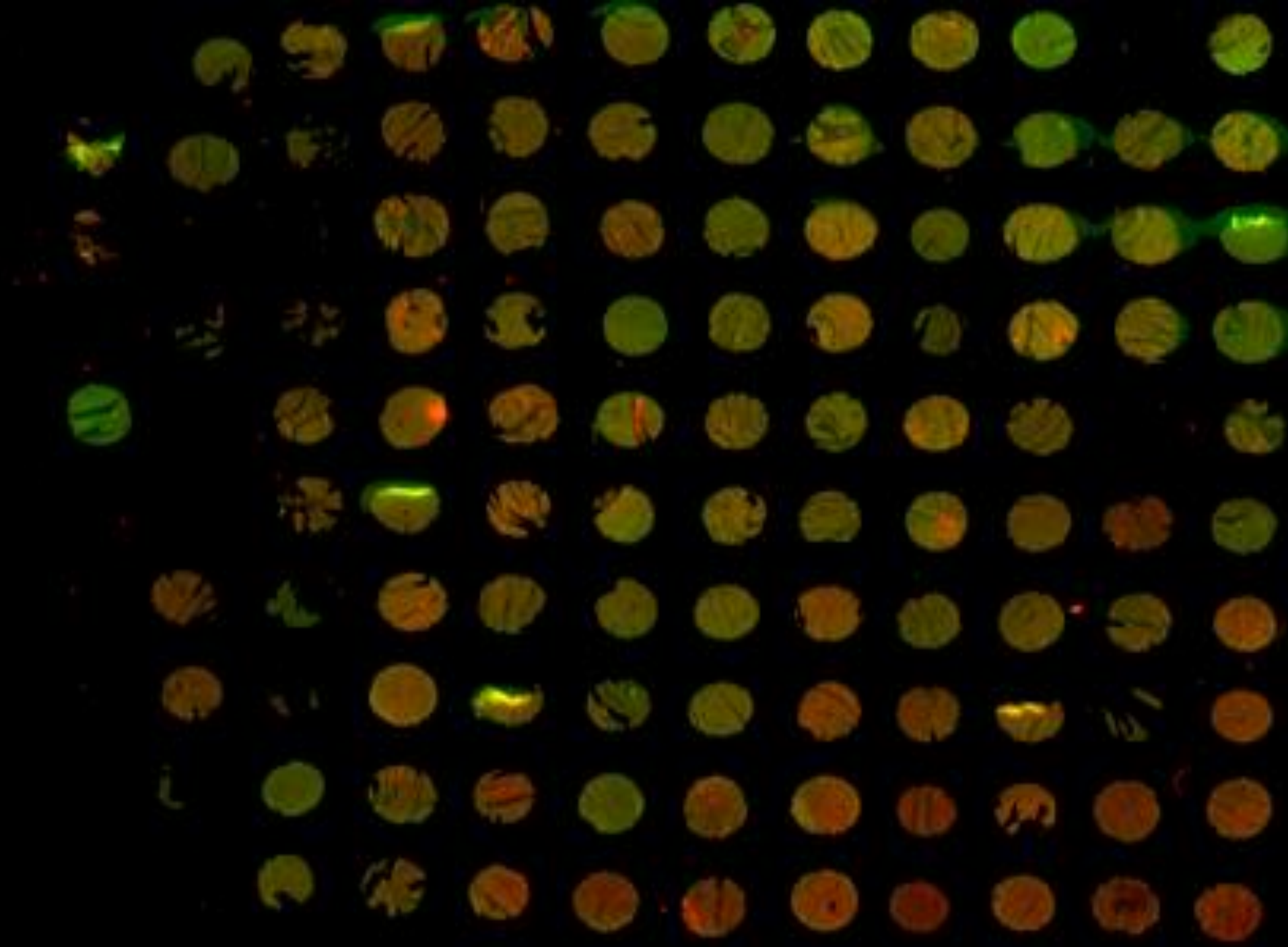
Human Heart Tissue Microarrays

The first stage in the process

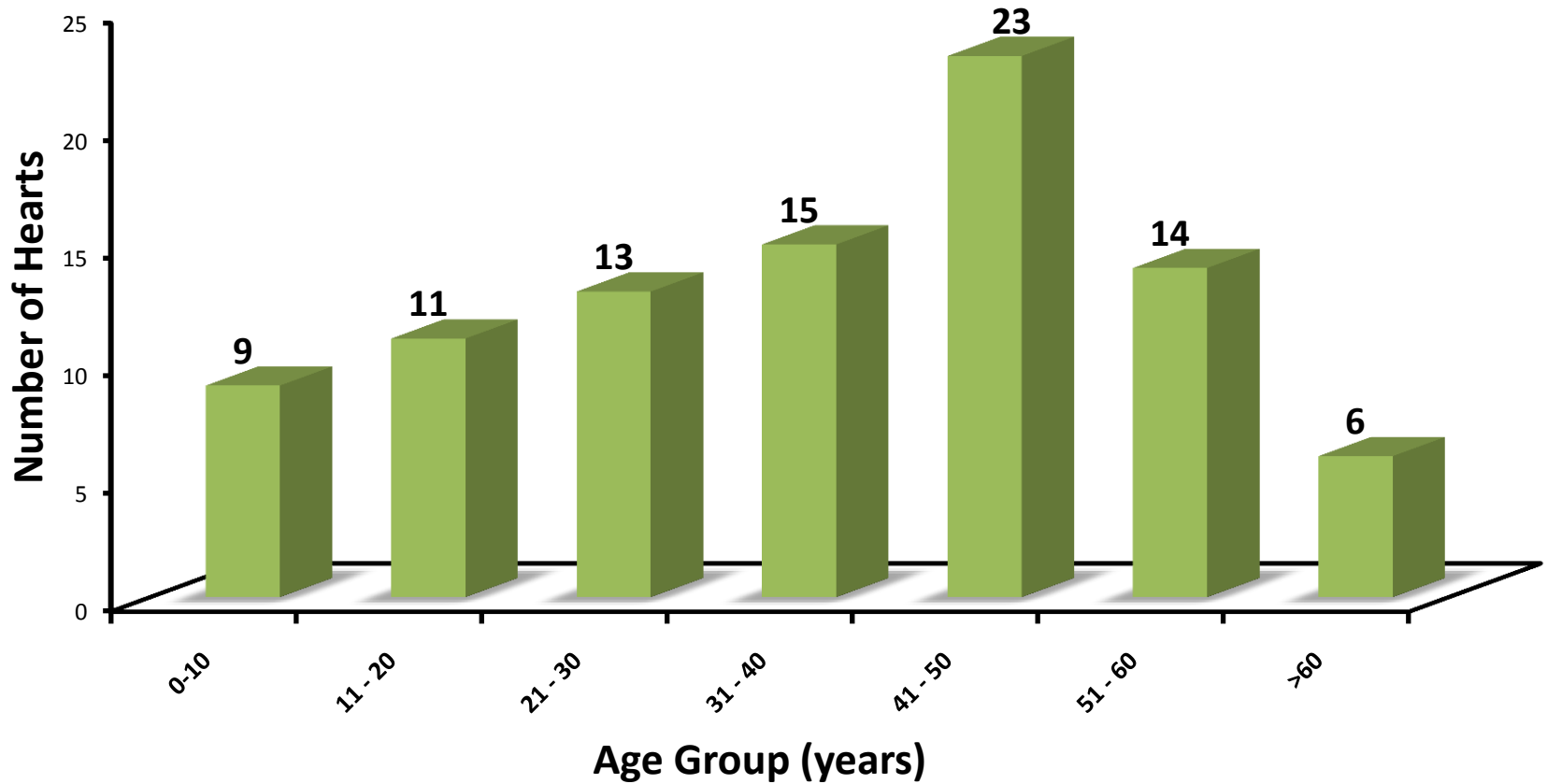


One tissue section can test
60 heart samples in duplicate

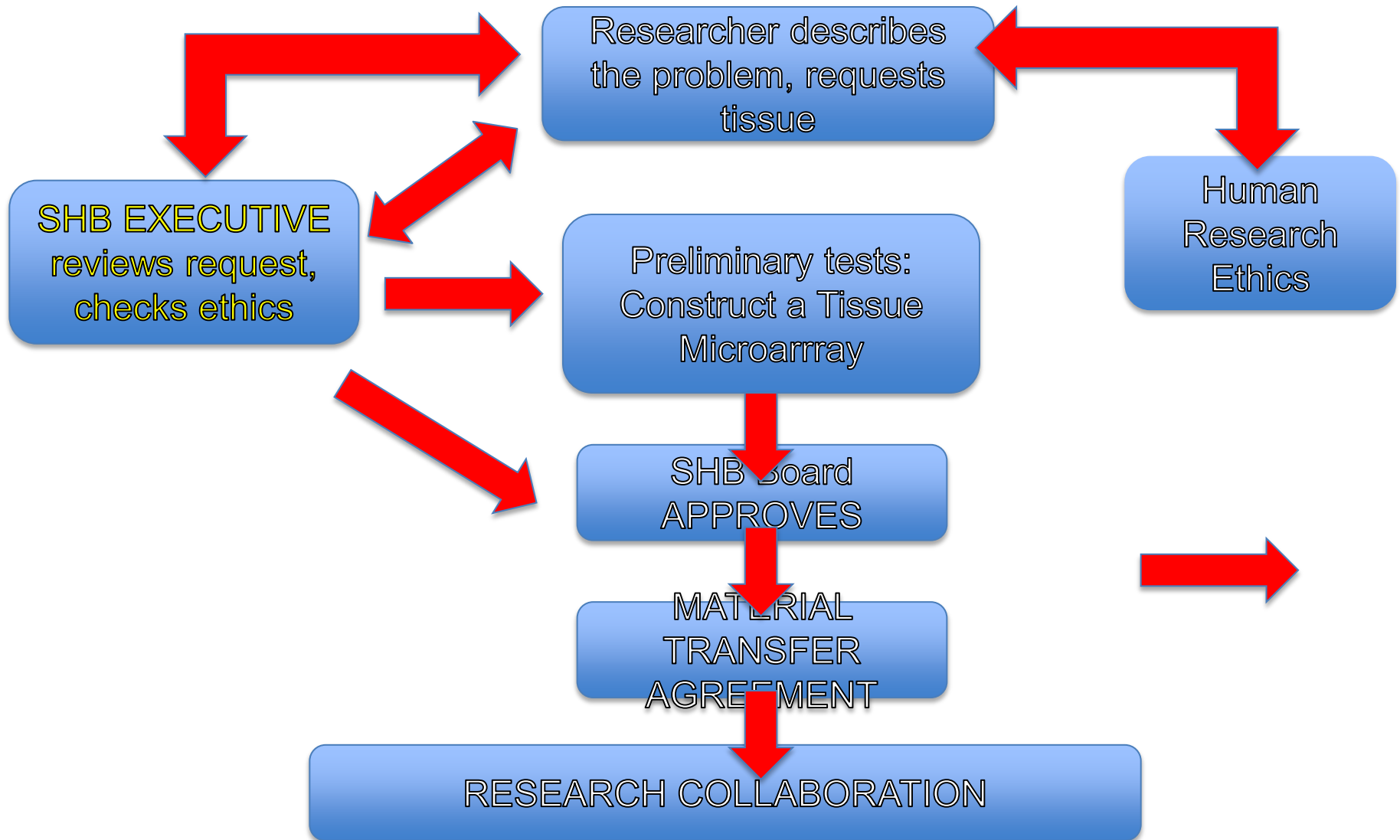
- How do we know that changes in failing heart are not also found in healthy hearts?



91 SHB Healthy Donor Hearts



How the Sydney Heart Bank Works



Thank you to ...

- We thank Medical Advances Without Animals for their generous financial support for the purchase of a nitrogen vapour storage facility.
- I am very grateful to the many students and post-doc that have assisted in the collection of the hearts in the Sydney Heart Bank