

Achieving the Transition to Personal Fellowship and Group Leader

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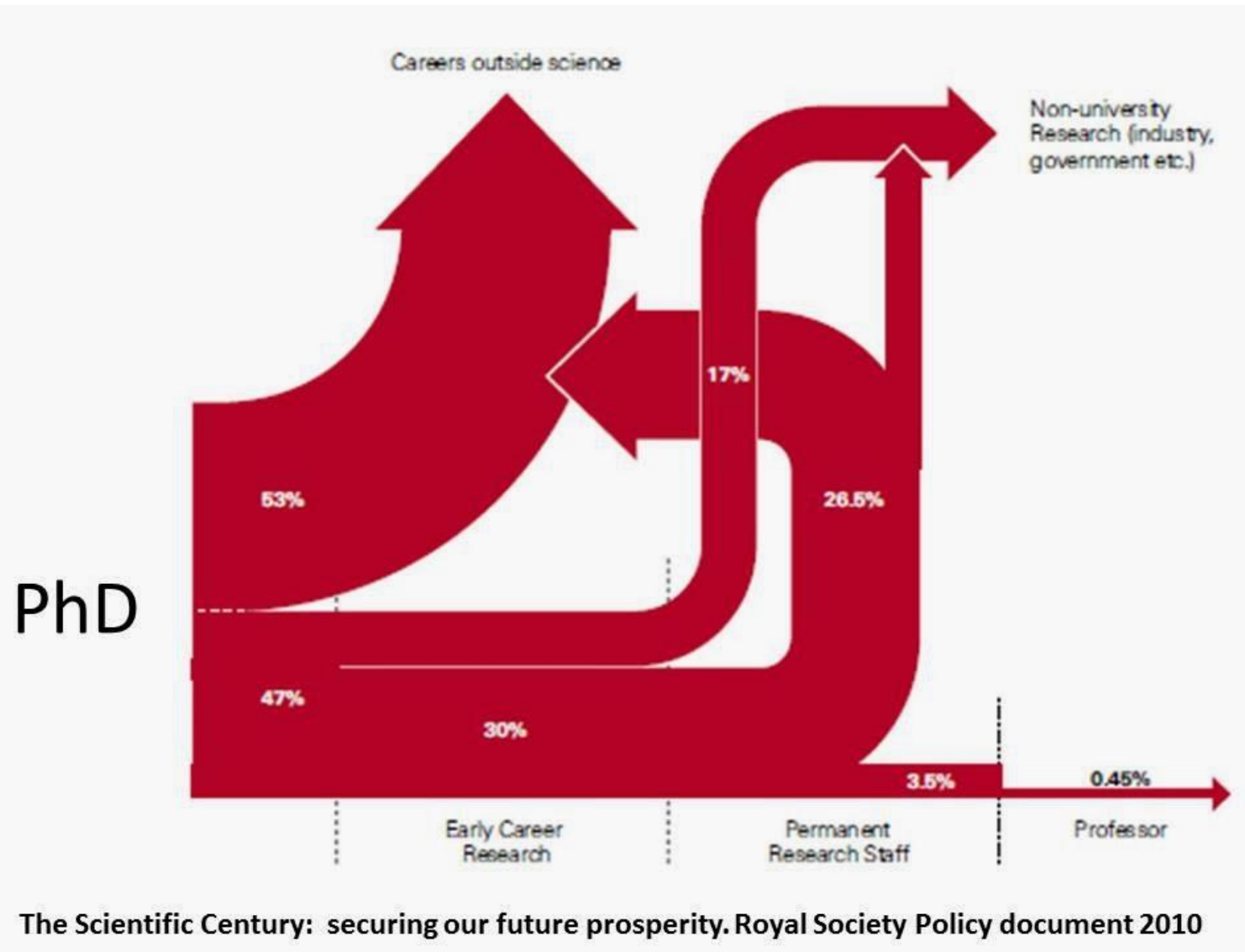
University of Oxford



The Disclaimer...

- **I am NOT an expert on this subject**
- **My personal perspective and views**
- **You may not agree**
- **That's good... we can discuss!**

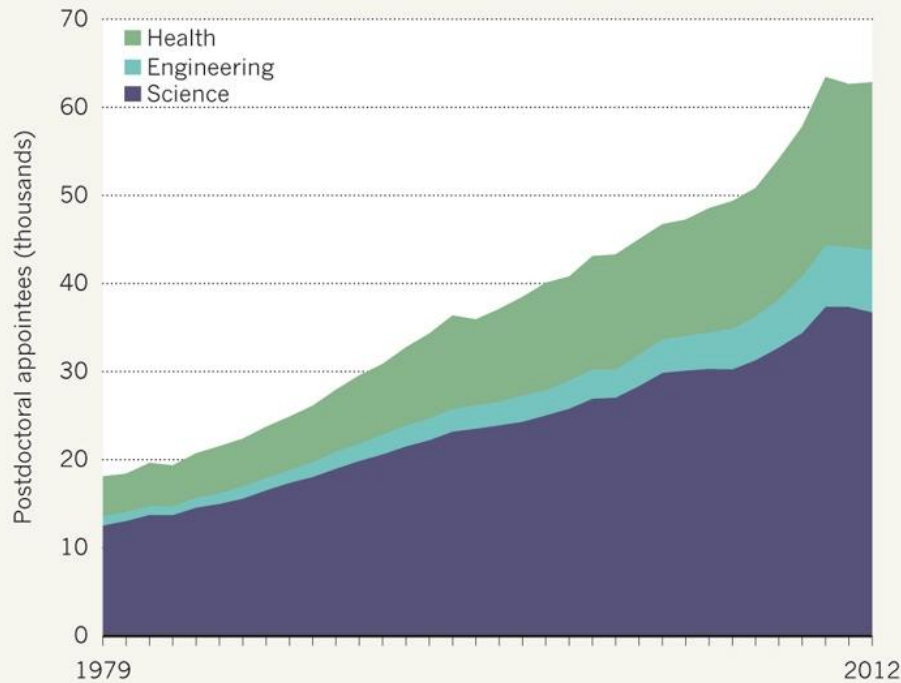
The Reality...



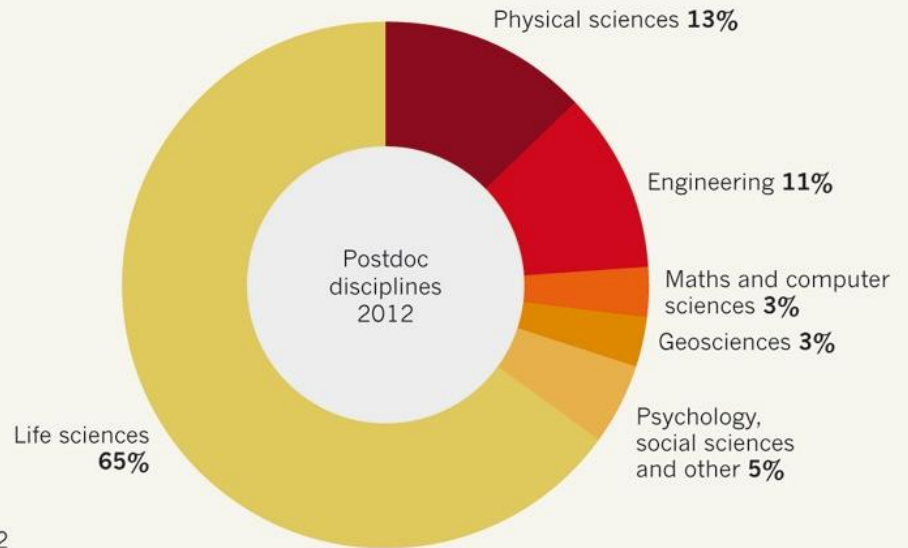
The Postdoc Pile-Up

THE POSTDOC PILE-UP

The number of researchers in US postdoctoral positions has more than tripled since 1979. The vast majority of postdocs are in the life sciences. Across fields, median salaries for postdocs are outstripped by those for non-postdoc positions, when measured up to 5 years after receiving a PhD.



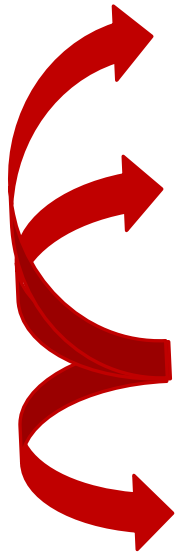
Median salaries 2010	Non-postdoctoral	US\$76,000
	Postdoctoral	\$43,000



Source: Nature

So why do it?

- A job that isn't work!
- Excellent PhD students
- Grant funding = post-docs
- More papers = raise your profile in the field
- Great collaborations with people who share your interests
- Travel



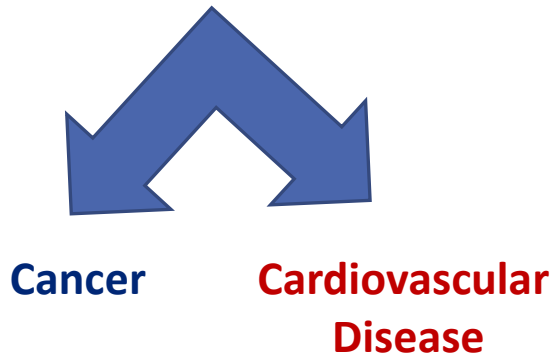
My Journey...

The Postdoc: “A Special Kind of Hell”



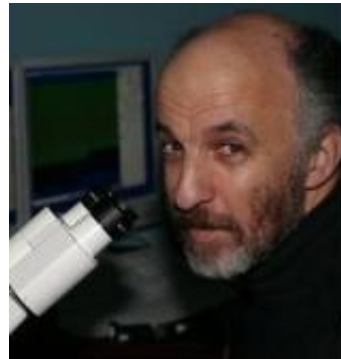
Life after PhD...

PhD (University of London) on PKC Signalling Mechanisms Funded by BBSCRC



2 year project grant

Signalling Mechanisms underlying Ischaemia-Reperfusion Injury and Preconditioning



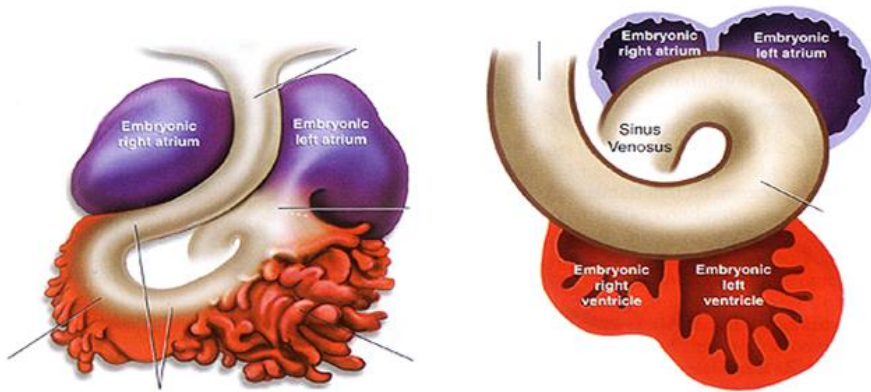
Smart, N, Mojet, MH, Latchman, DS, Marber, MS, Duchen, MR, Heads, RJ (2006) IL-6 induces PI 3-Kinase and nitric oxide-dependent protection and preserves mitochondrial function in cardiomyocytes. *Cardiovascular Research*. **69** (1), 164-177.

Fahmi, A, **Smart, N**, Punnett, A, Jabr, R, Marber, M, Heads, R (2012). p42/p44-MAPK and PI3K are sufficient for IL-6 family cytokines/gp130 to signal to hypertrophy and survival in cardiomyocytes in the absence of JAK/STAT activation. *Cell Signal*. **25**(4): 898-909.

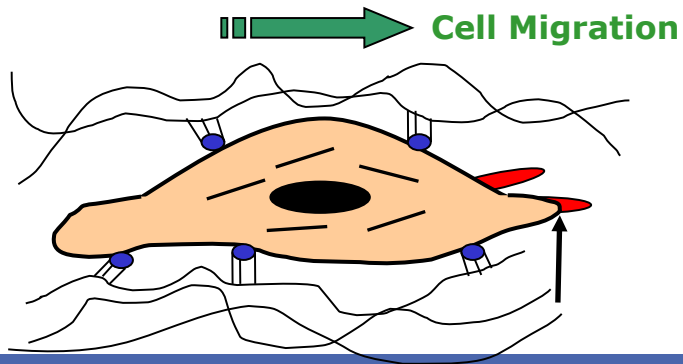


Paul Riley

Molecular Medicine Unit



bHLH Transcription Factor: Hand1



Thymosin β 4

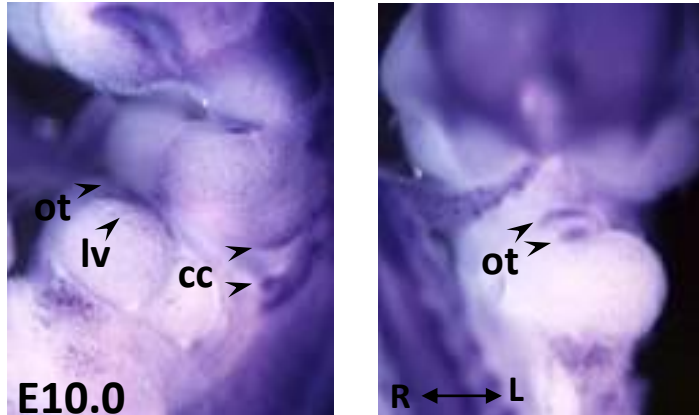
β -actin



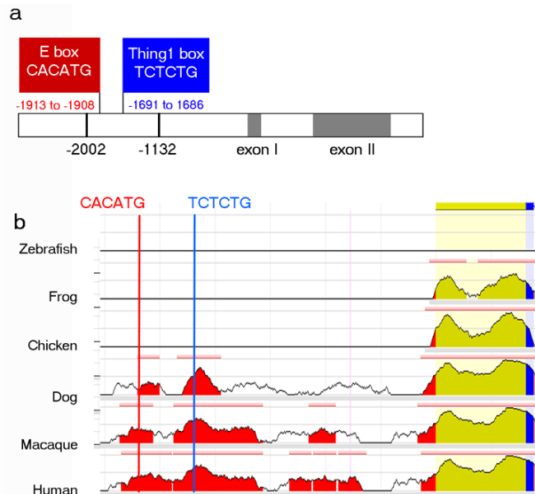
- Is Thymosin β 4 a transcriptional target of Hand1?
- Role of T β 4 in cardiac morphogenesis

Validation of Thymosin $\beta 4$ as a Hand1 target

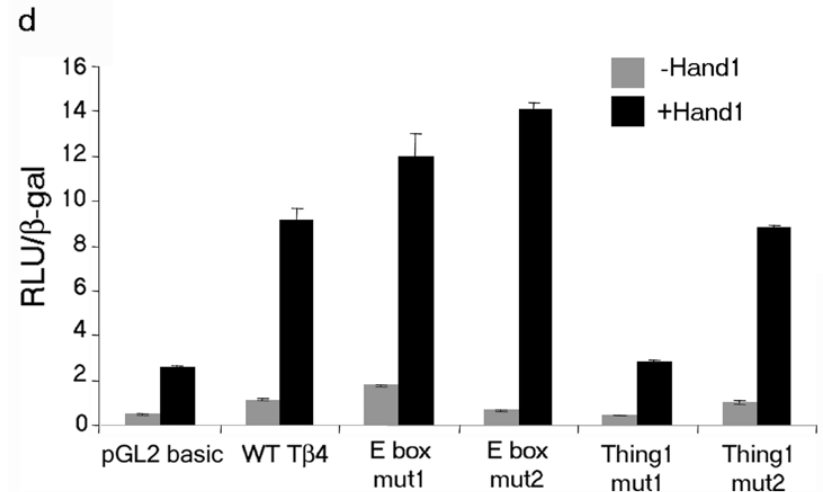
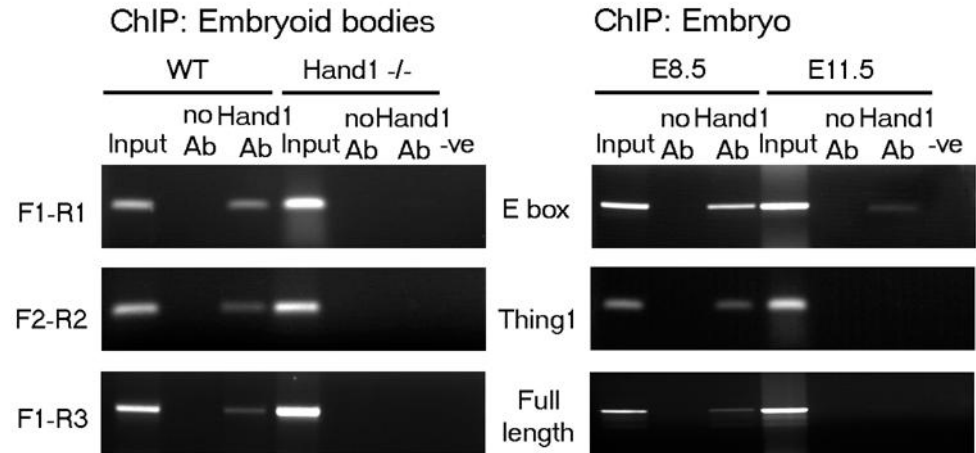
- $T\beta 4$ is co-expressed with *Hand1* in the developing heart



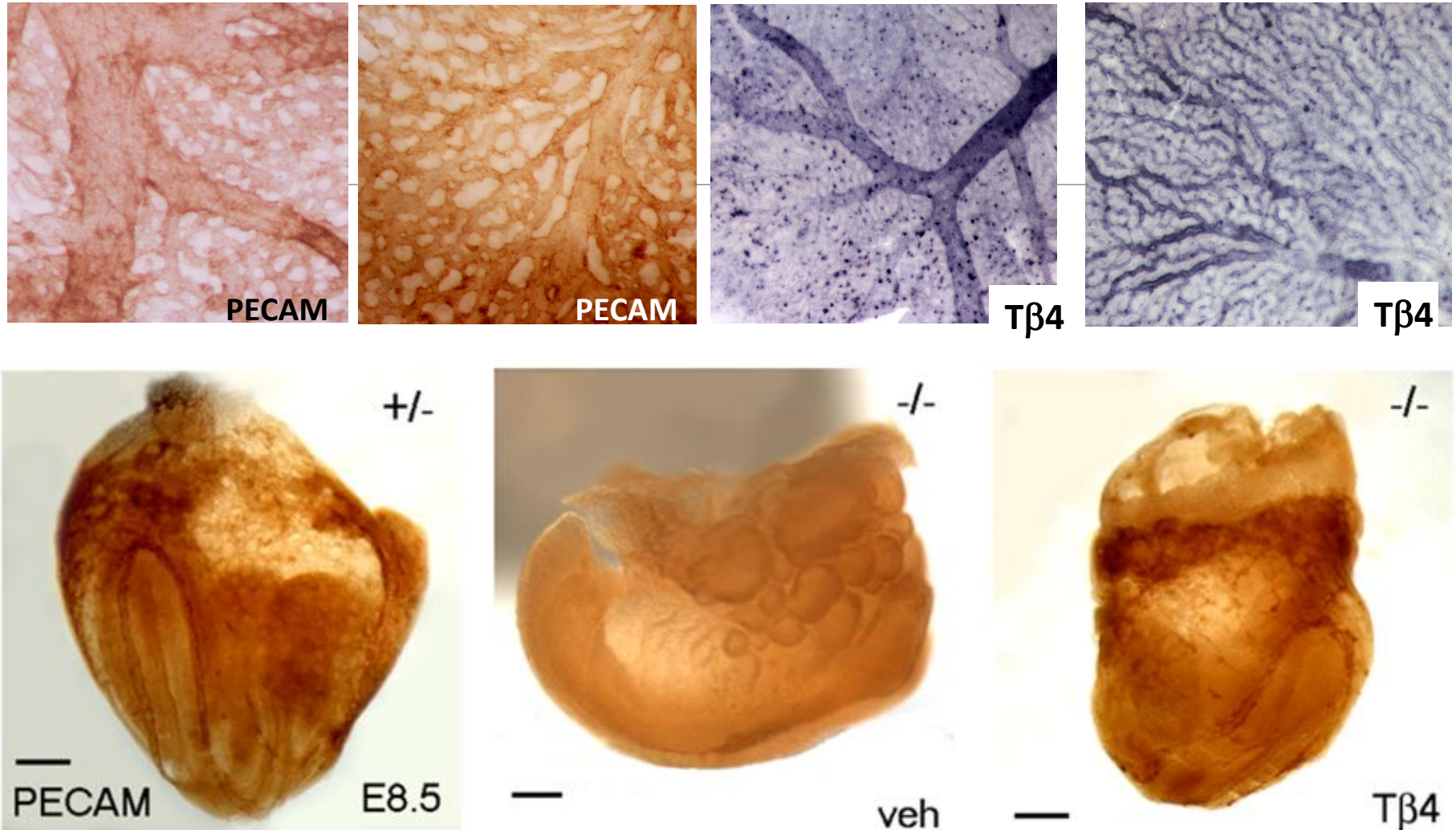
- Hand1 regulates $T\beta 4$ expression



- $T\beta 4$ is a direct target of Hand1

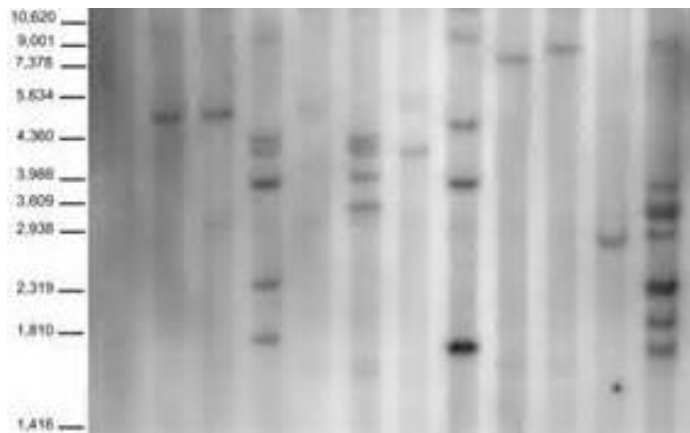
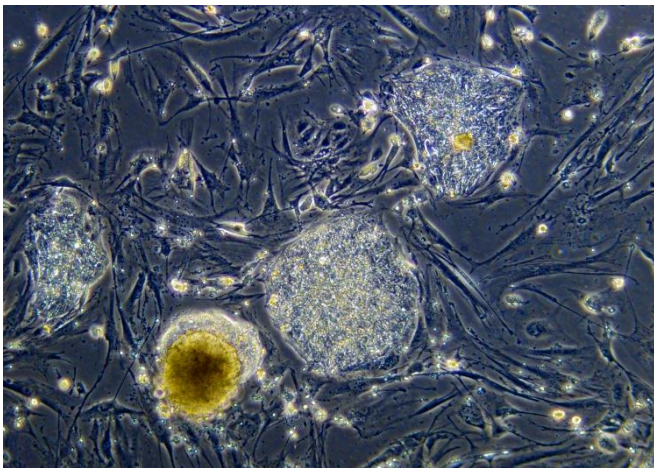
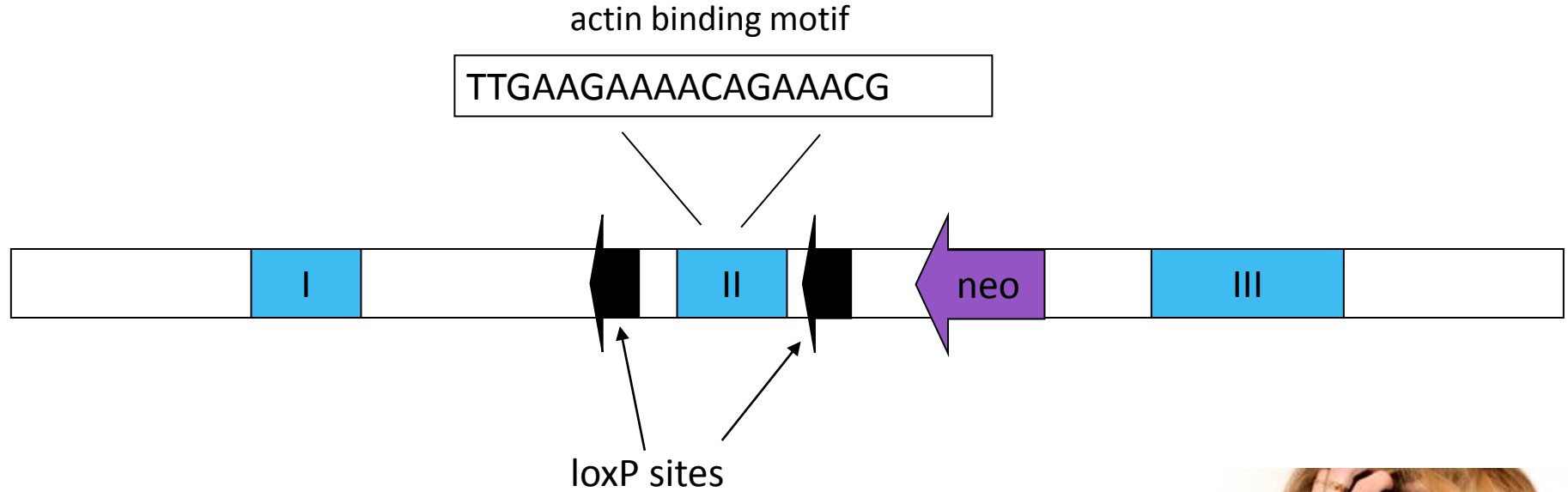


A role for the Hand1-T β 4 pathway in yolk sac vasculogenesis

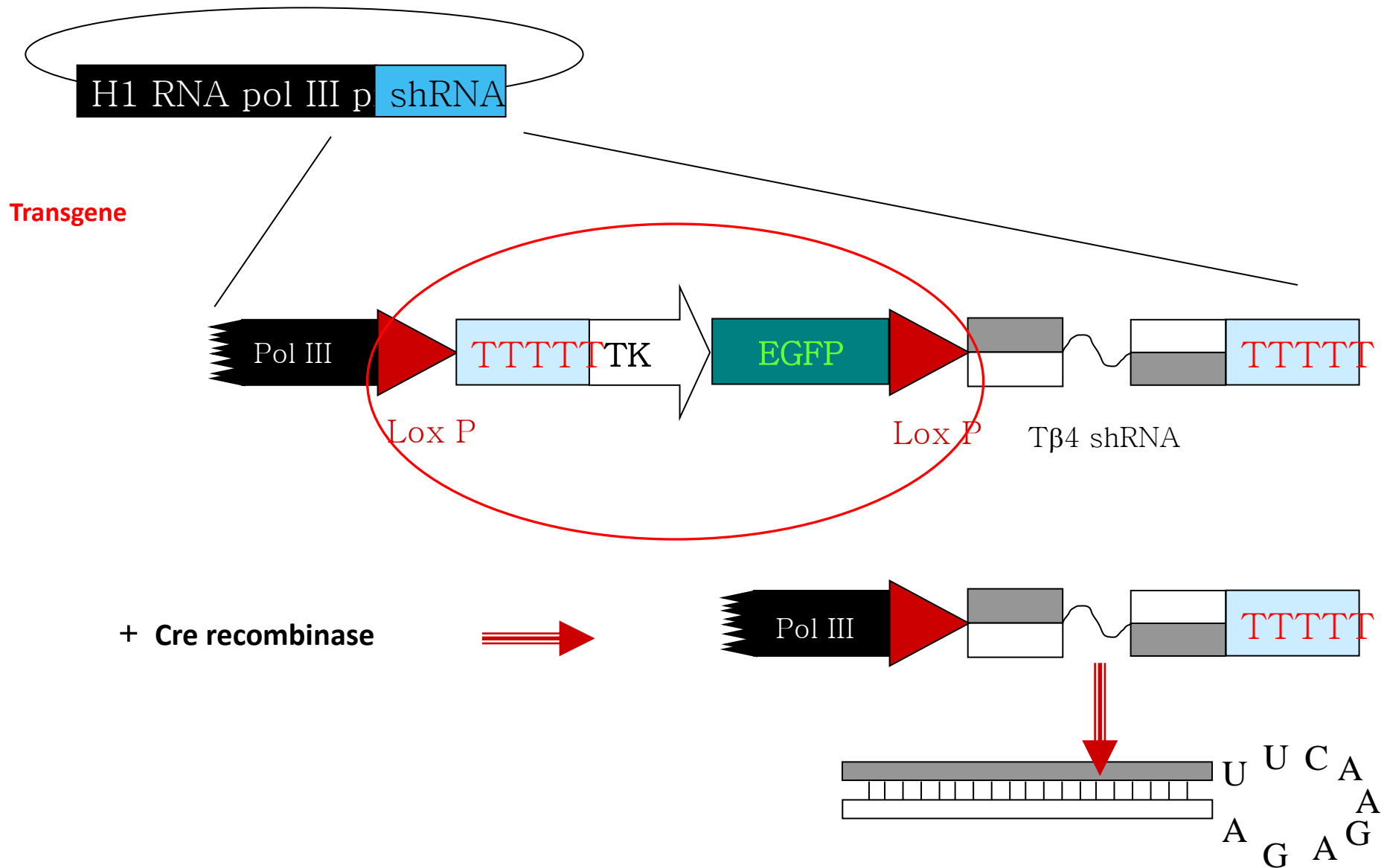


Intraperitoneal injection of pregnant females with T β 4 (6mg/kg)

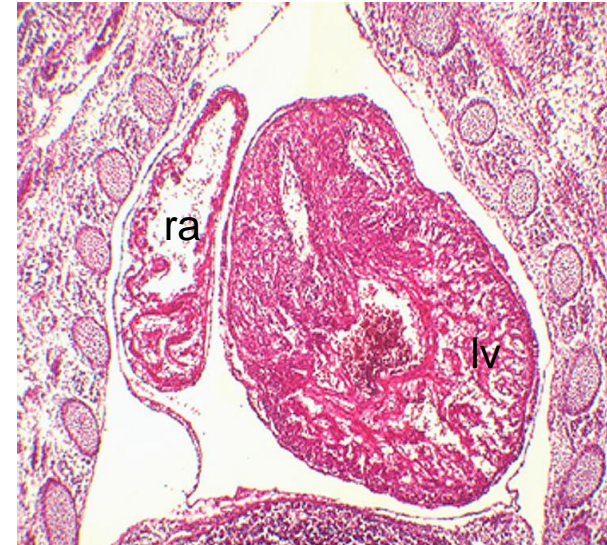
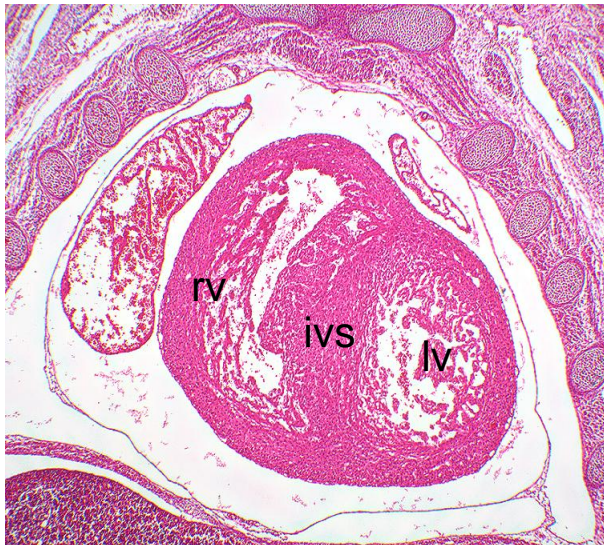
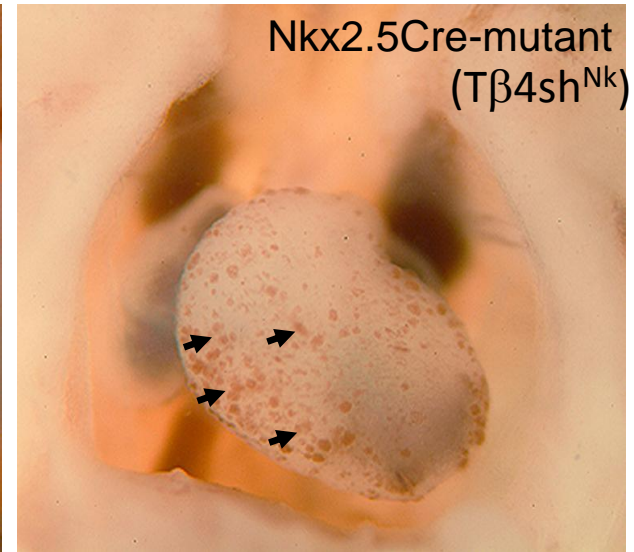
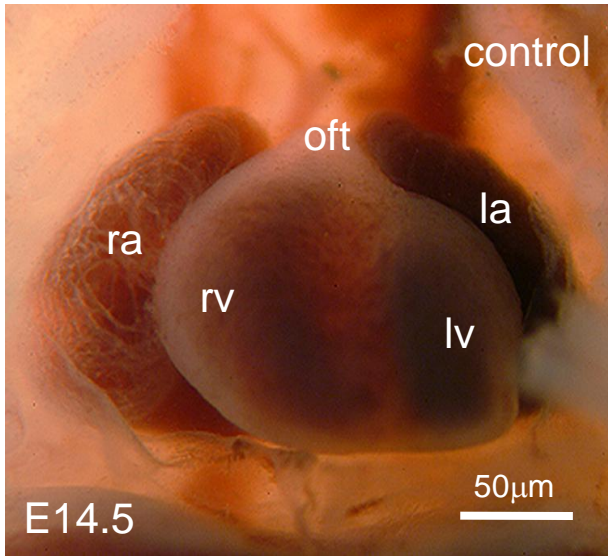
Conditional T β 4 Knockout: 'floxed' T β 4 construct



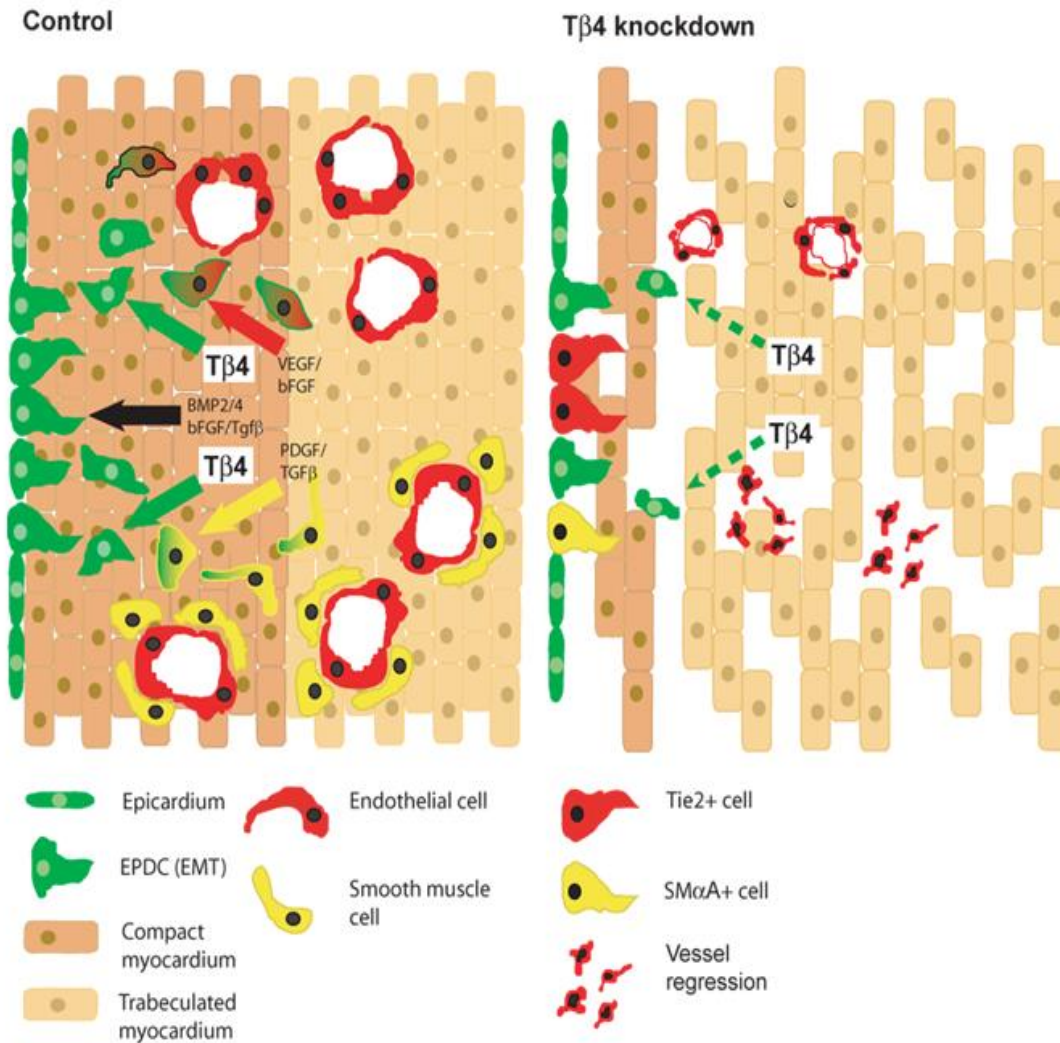
Conditional RNA Interference (RNAi) for Knockdown of T β 4 in Transgenic Mice



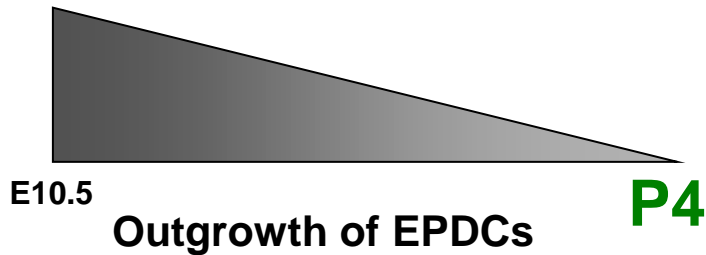
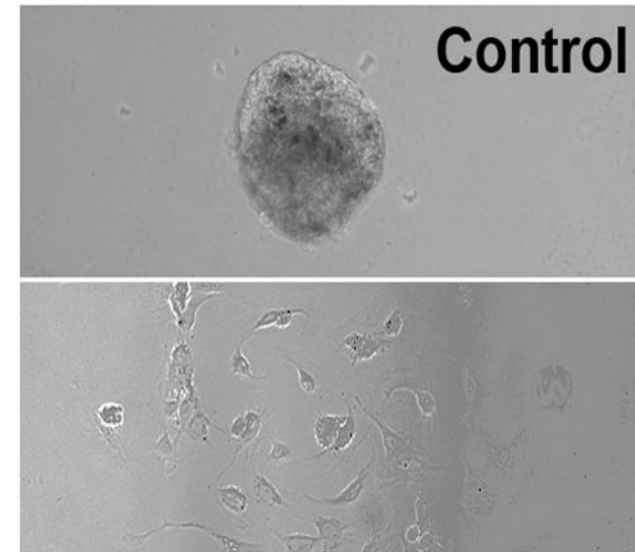
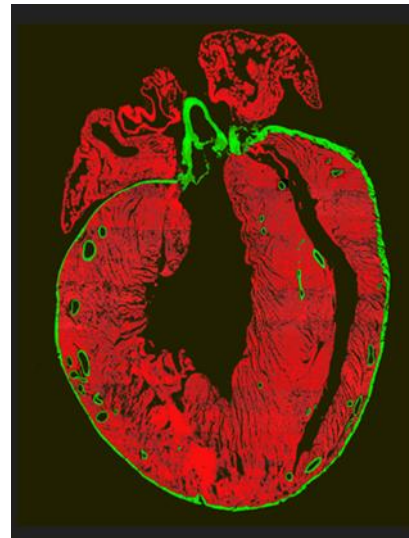
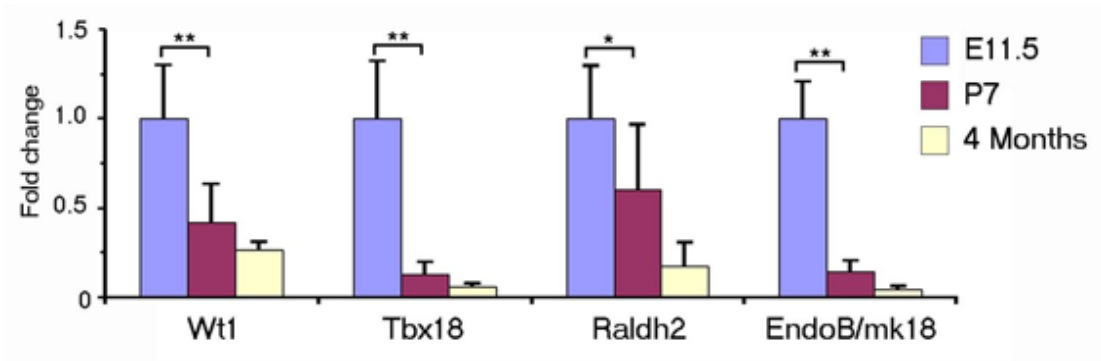
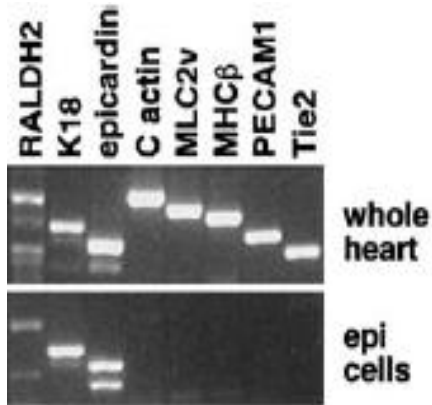
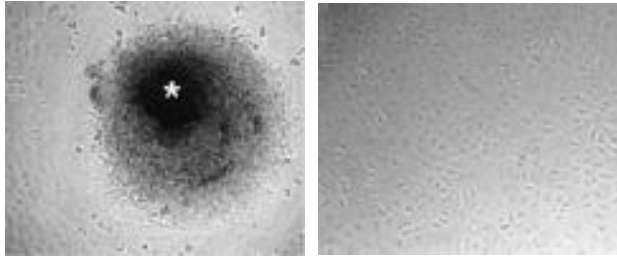
Cardiac-specific knockdown of $T\beta 4$



The role of T β 4 in coronary vessel development

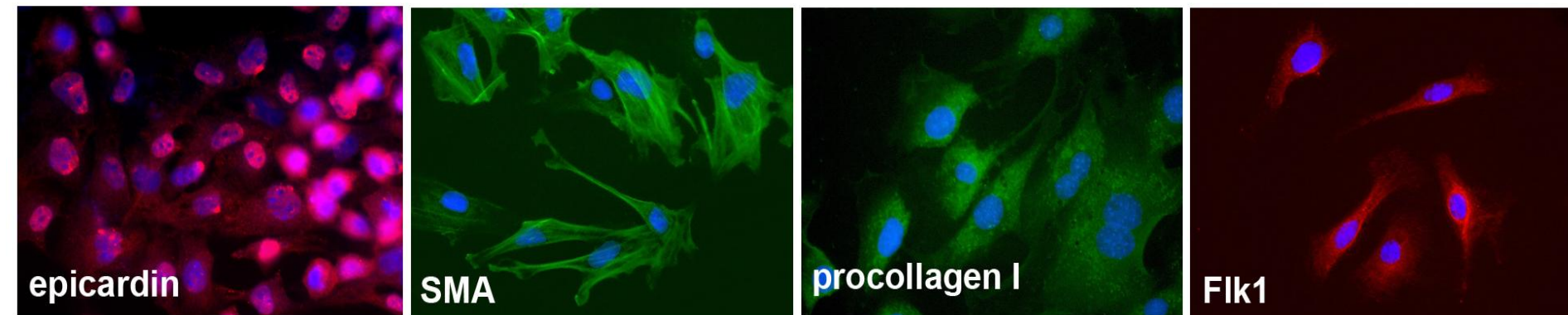
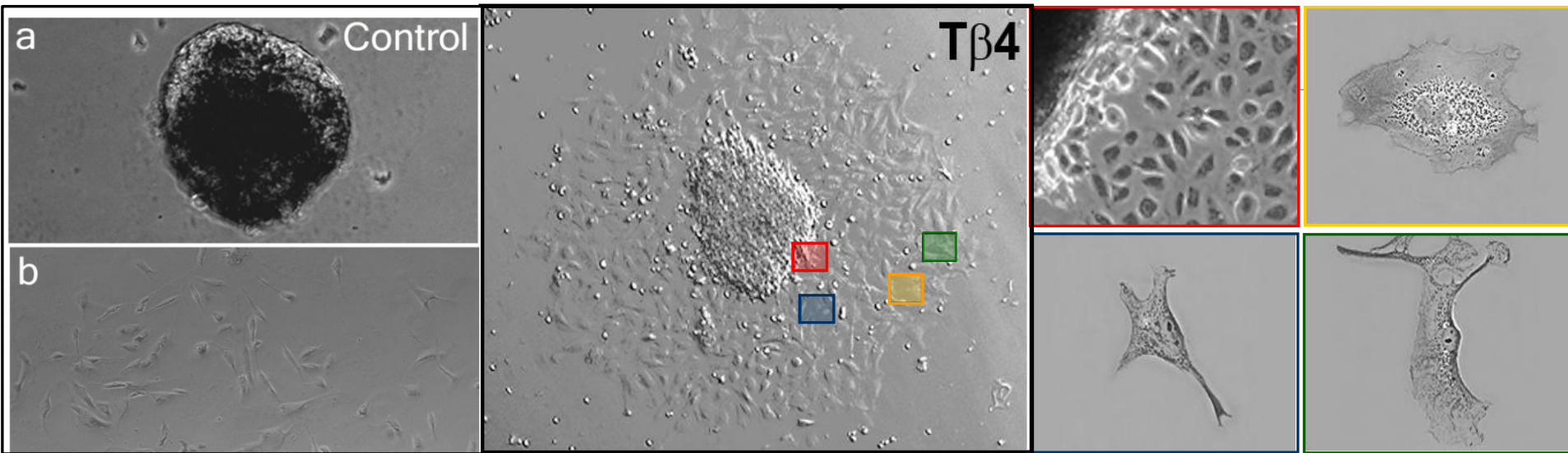


The Stimulation of Resident Cardiac Progenitor Cells



Chen et al (2002) Dev Biol. 250: 198-207.

$T\beta 4$ promotes migration of EPDCs from adult heart

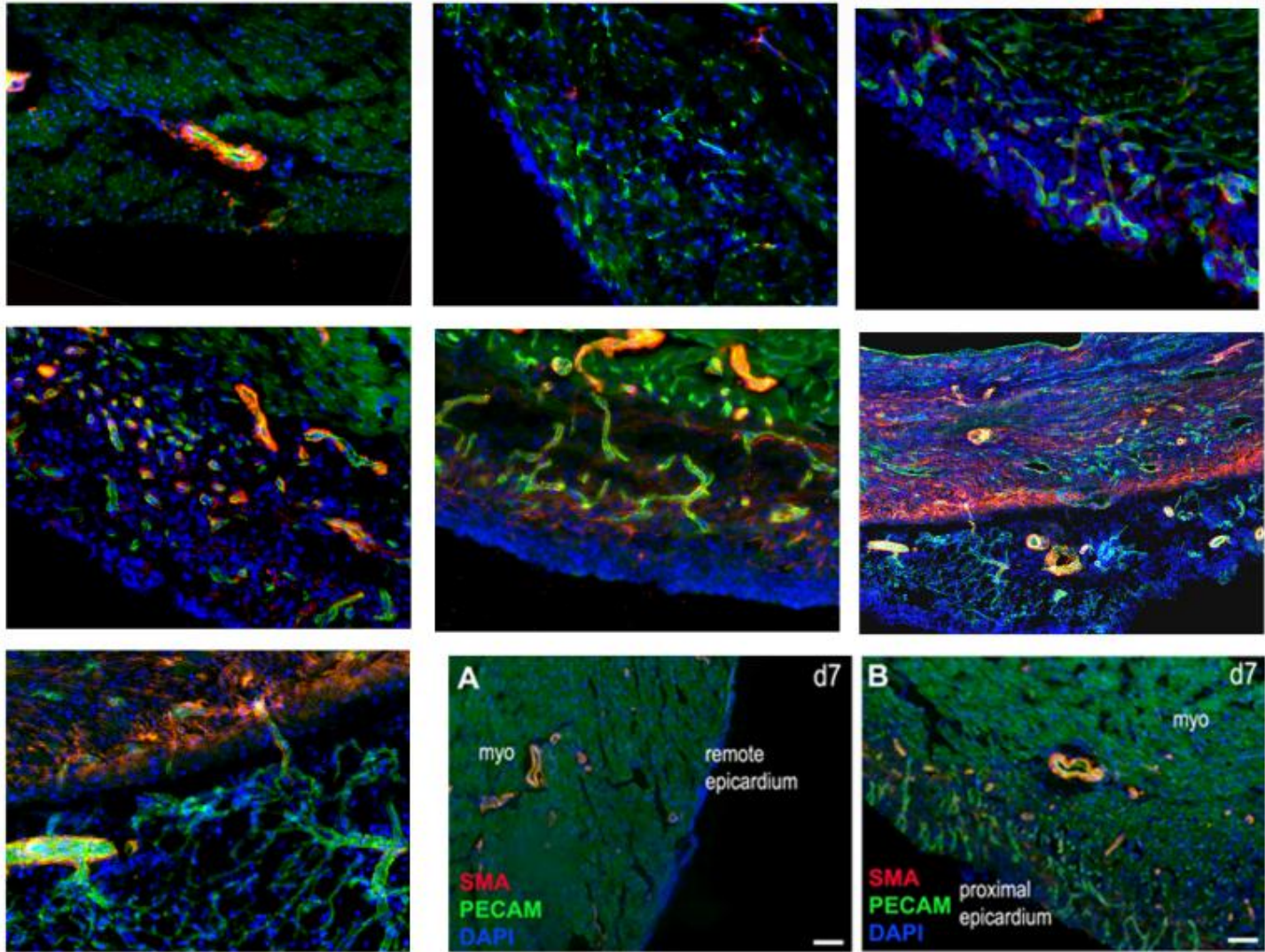




Intermediate Basic Science Research Fellowship:

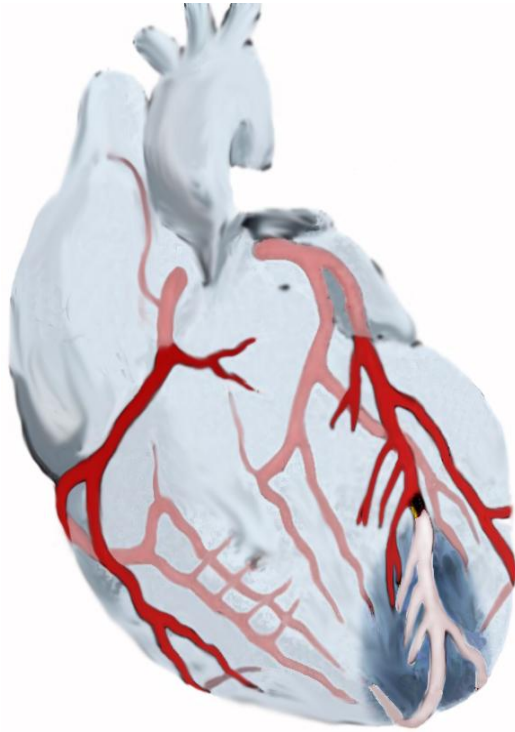
Investigating the potential for Thymosin β 4-induced neovascularisation in cardiac regeneration

T β 4 and the Epicardium: Neovascularisation



T β 4

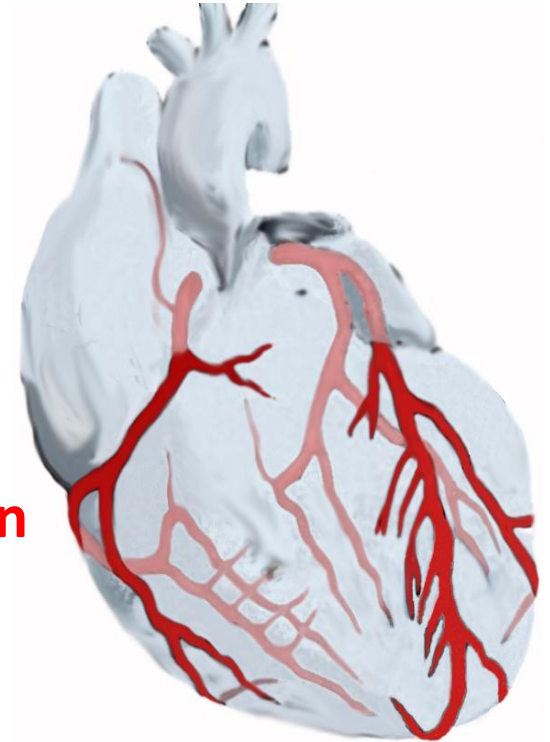
REPAIR



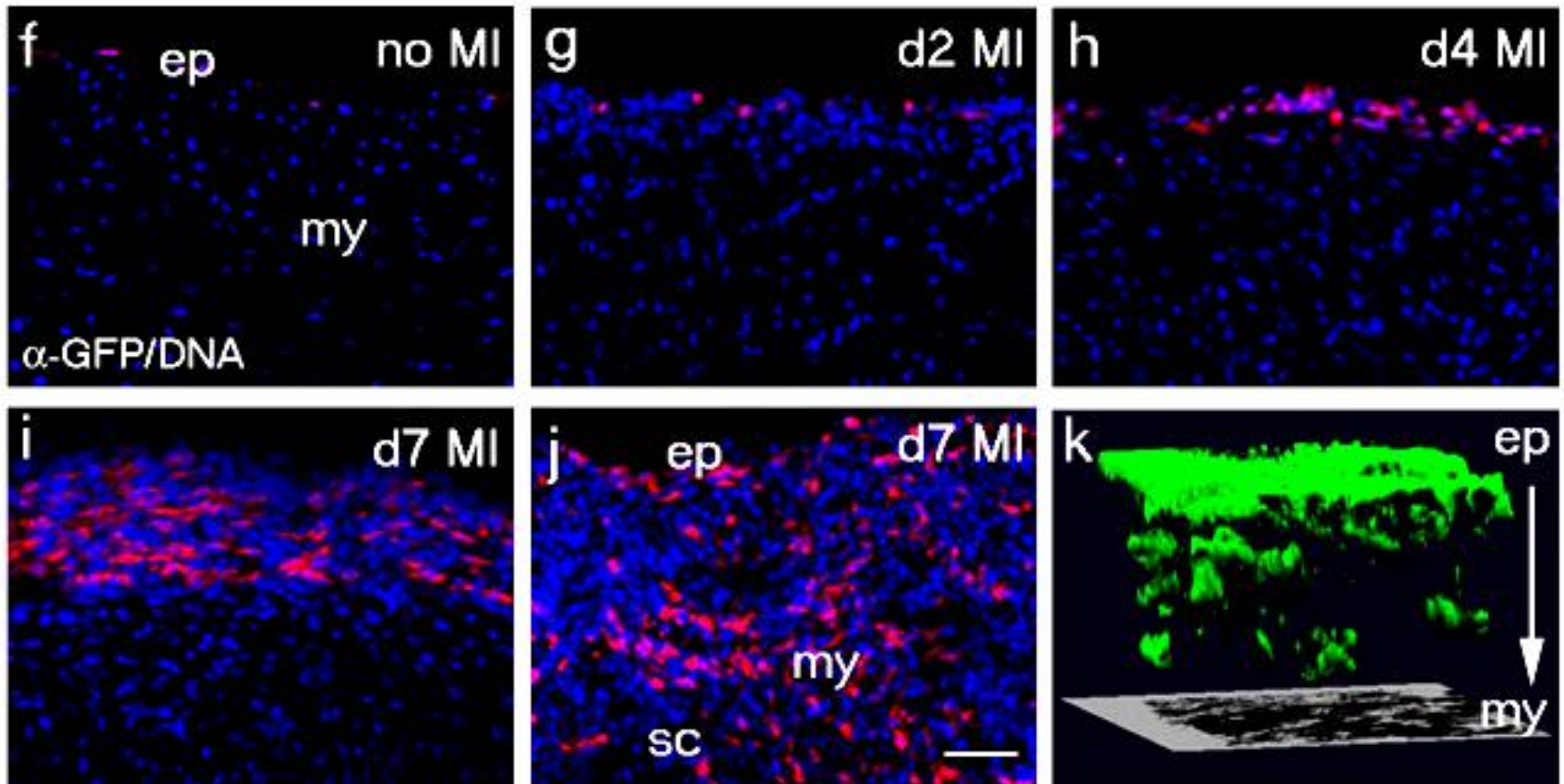
Neovascularisation

Myocardial Regeneration

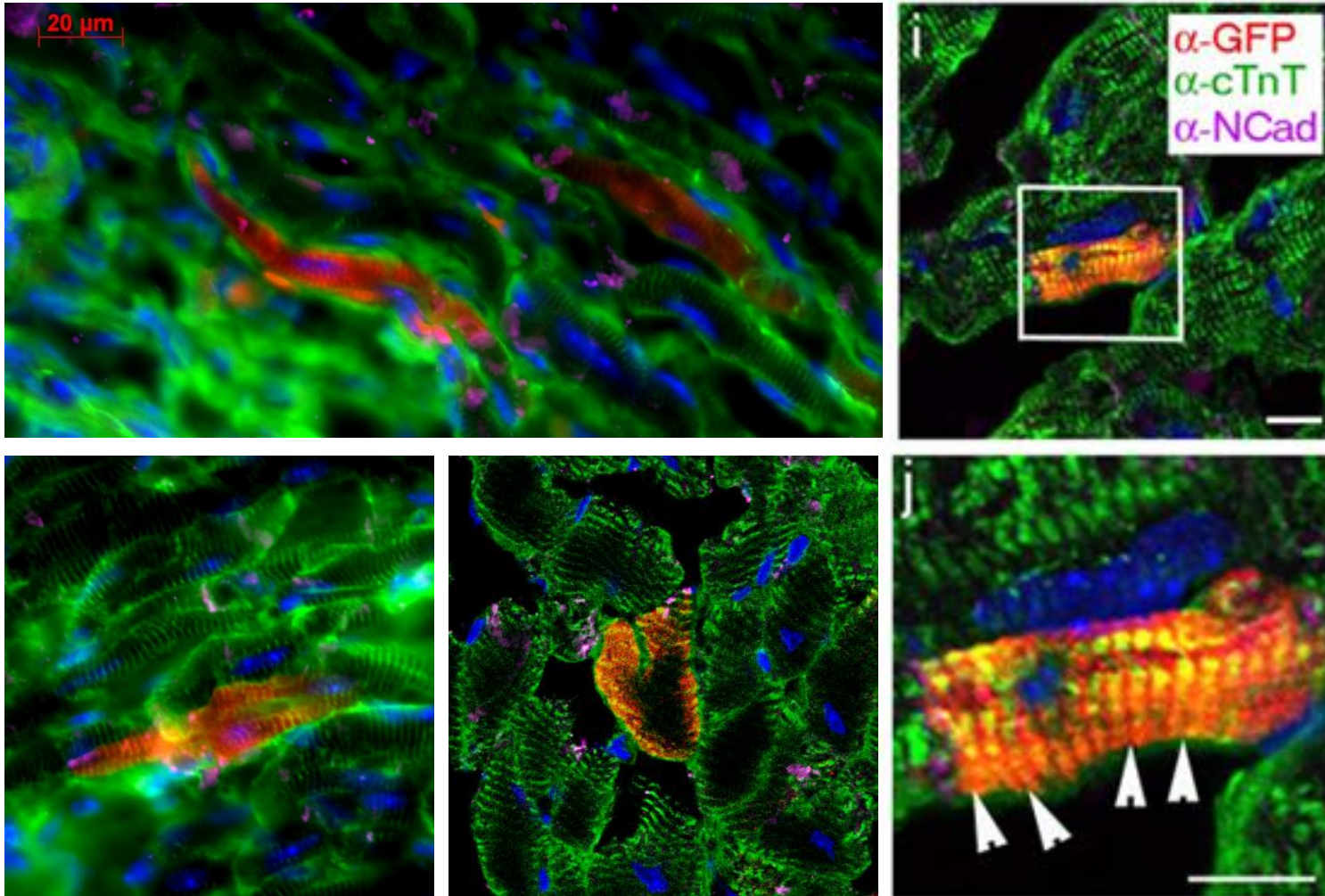
Inflammation



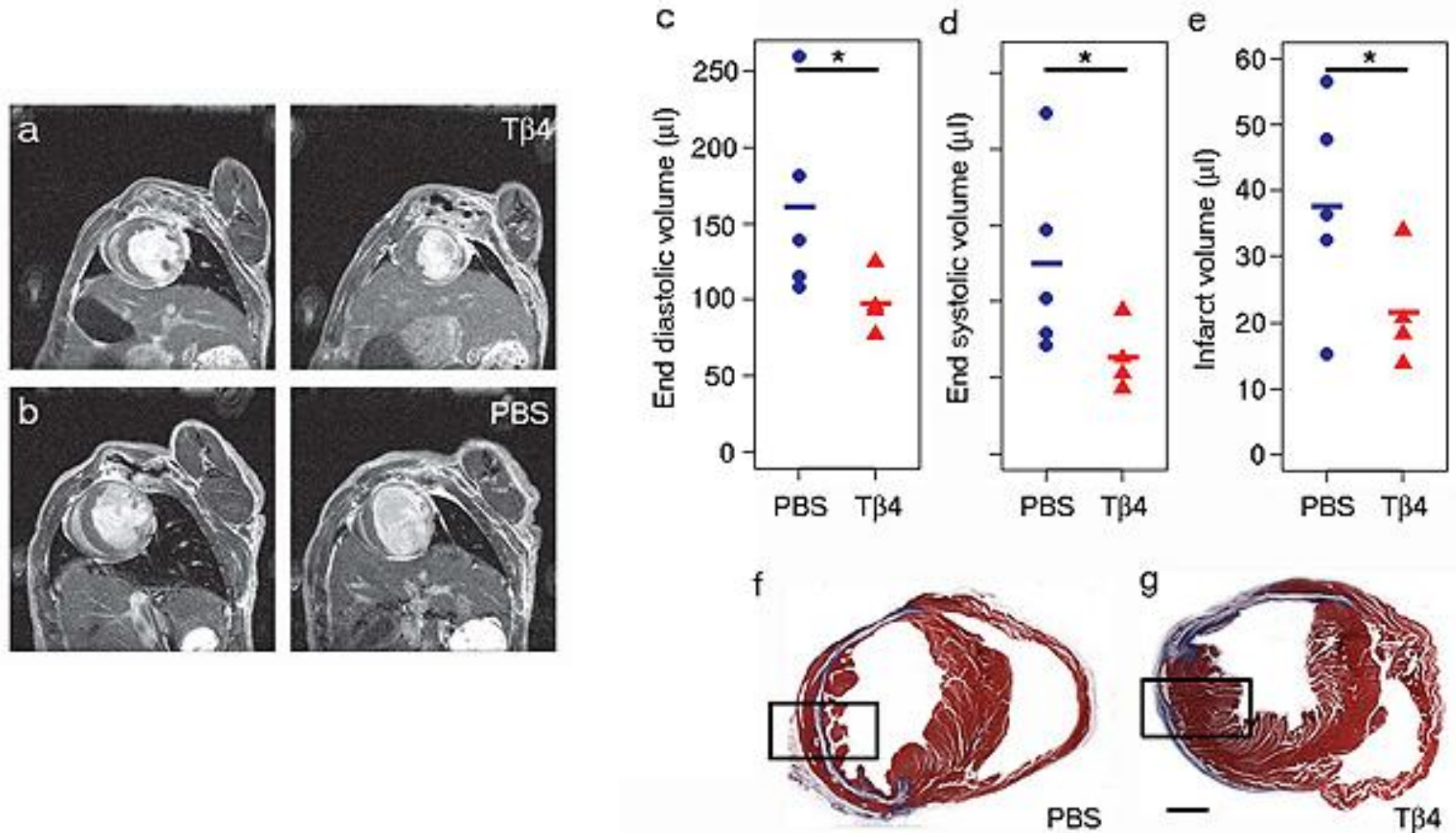
Expansion of GFP+ and YFP+ cells within the epicardium and sub-epicardial regions following T β 4 priming/injury



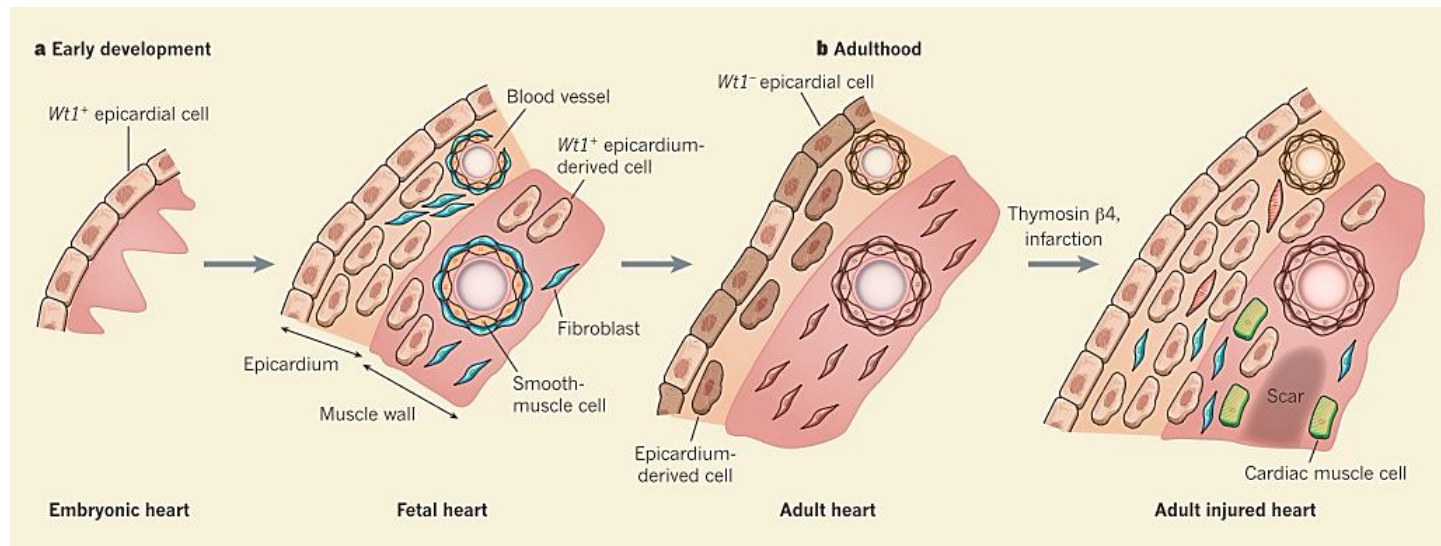
Activated adult EPDCs contribute *de novo* cardiomyocytes to the ischaemic heart



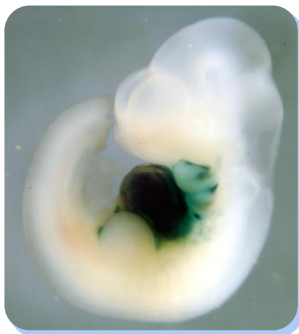
EPDC-derived cardiomyocytes and neovascularisation contribute to Improved cardiac function and reduced scarring



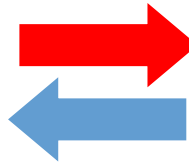
Recapitulating Heart Development in the Adult with Thymosin $\beta 4$



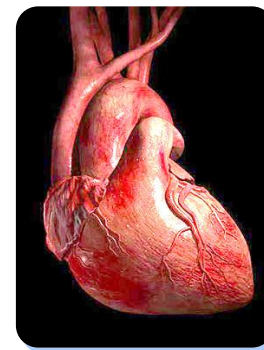
Christoffels (2011) *Nature* 474: 585-586

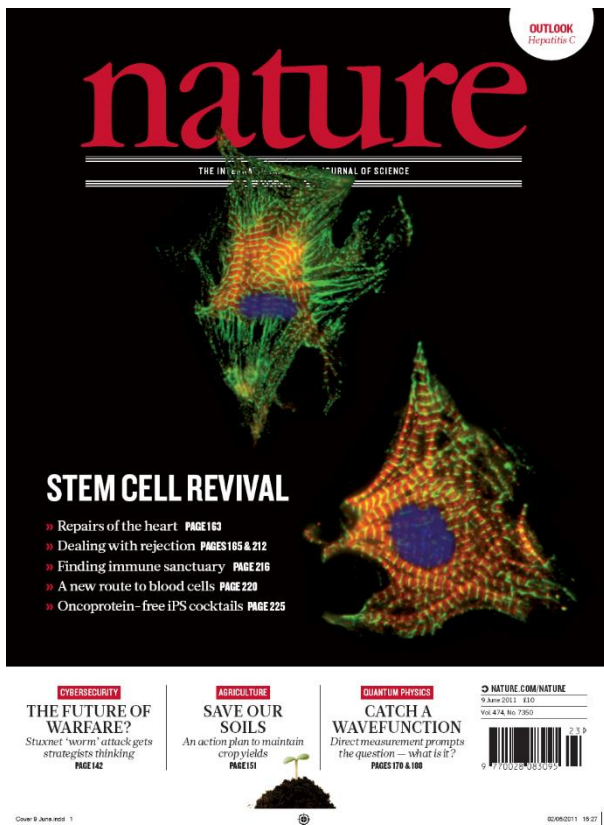


how to make a heart ?



how to repair a heart ?





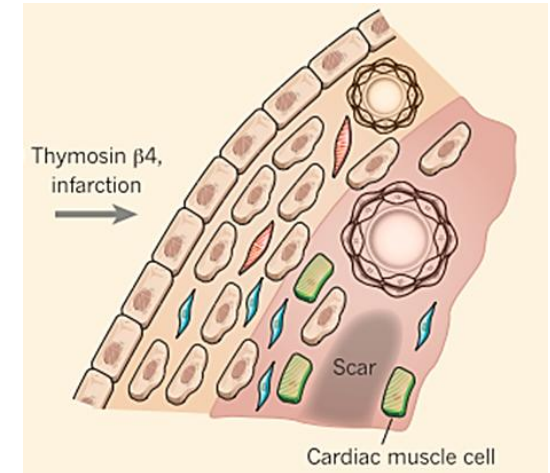
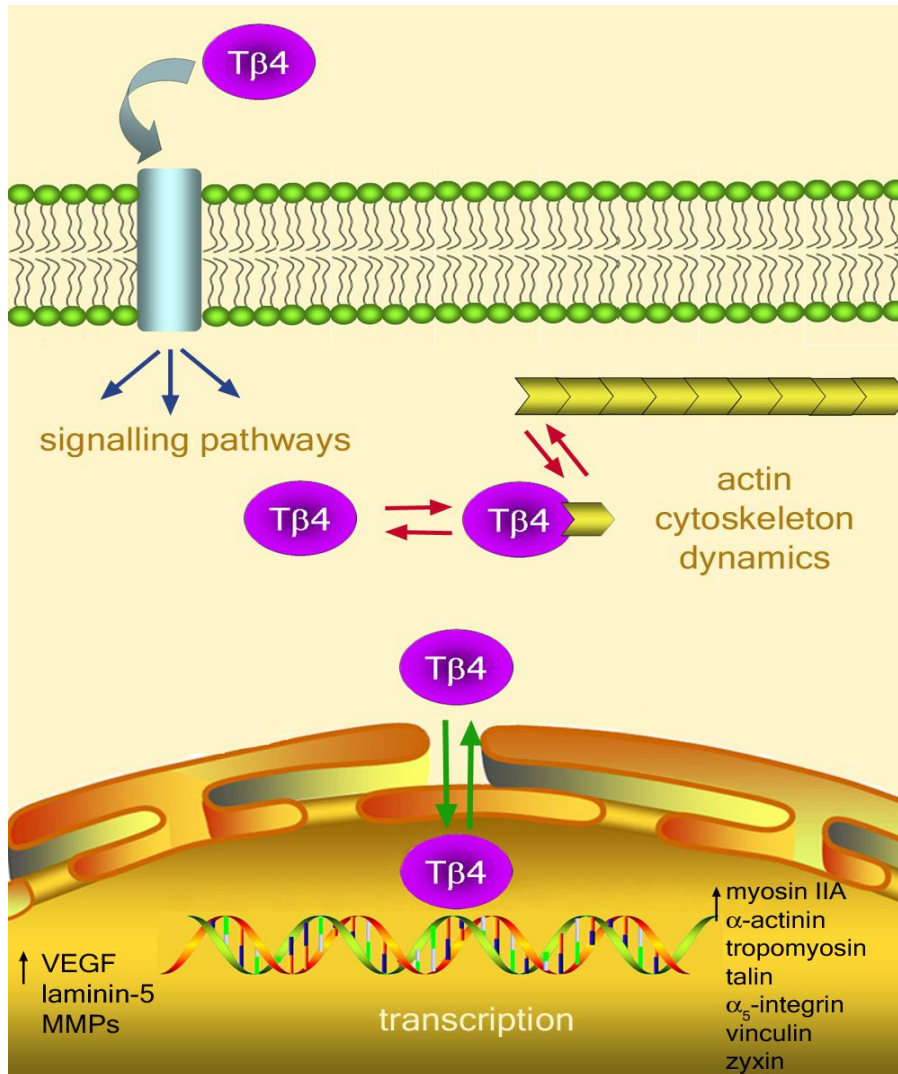
Smart et al (2011) *Nature* 474(7353):640-4

Next Step: Senior Fellowship Application

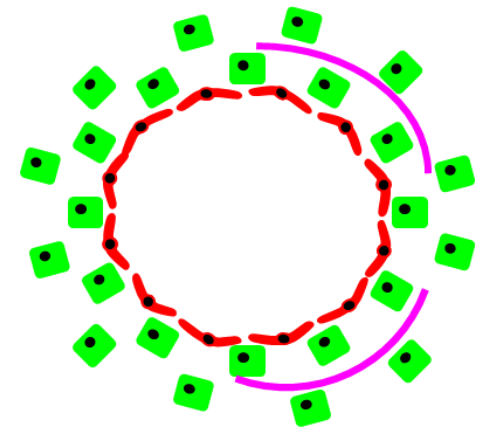
Key Question: Where to focus my independent research?



Y2H Screen: plenty of novel, interesting T β 4 interactors to follow up

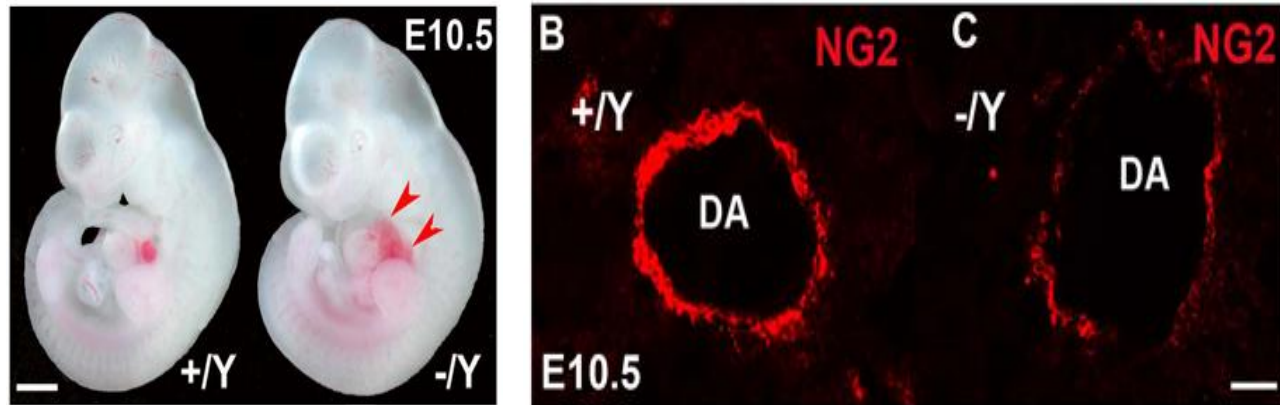


**Cardiac Regeneration
(via Epicardium)**

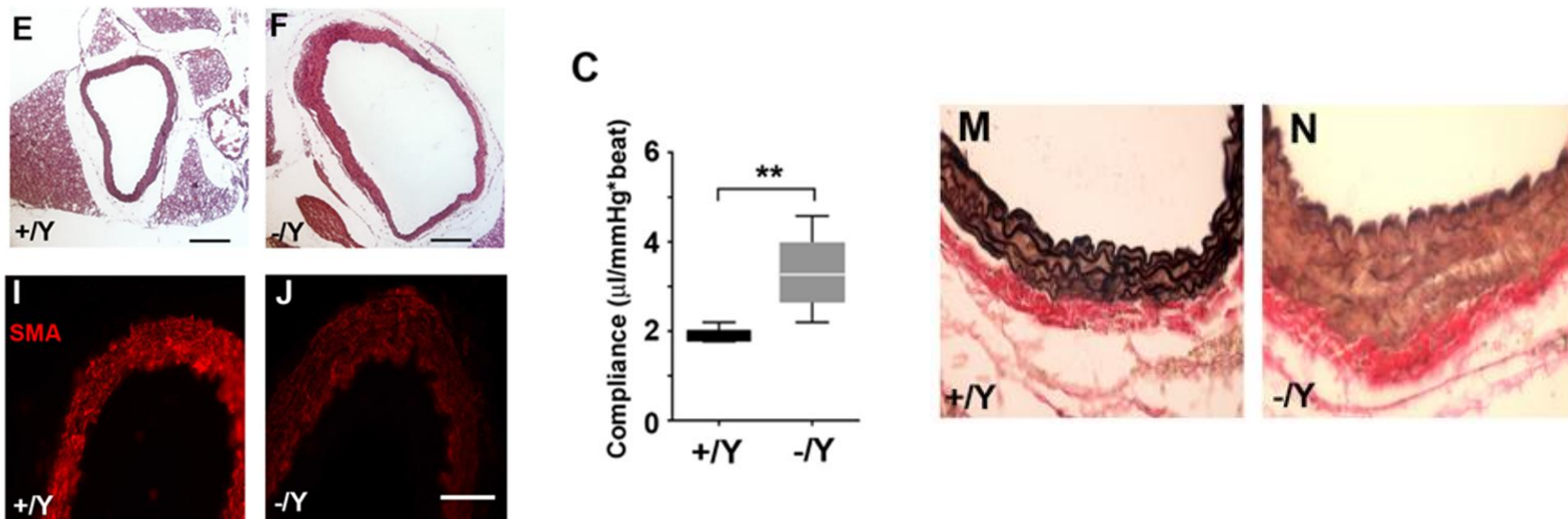


**Maintenance of Vascular
Stability**

Thymosin β 4 regulates vascular smooth muscle cell development



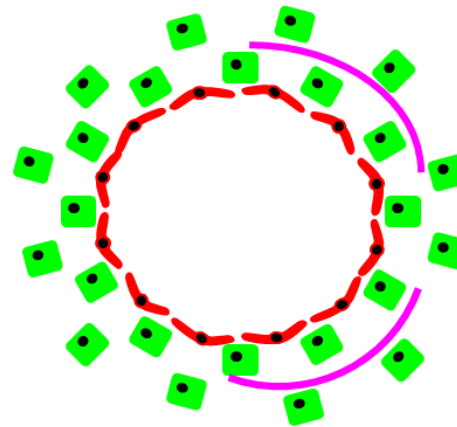
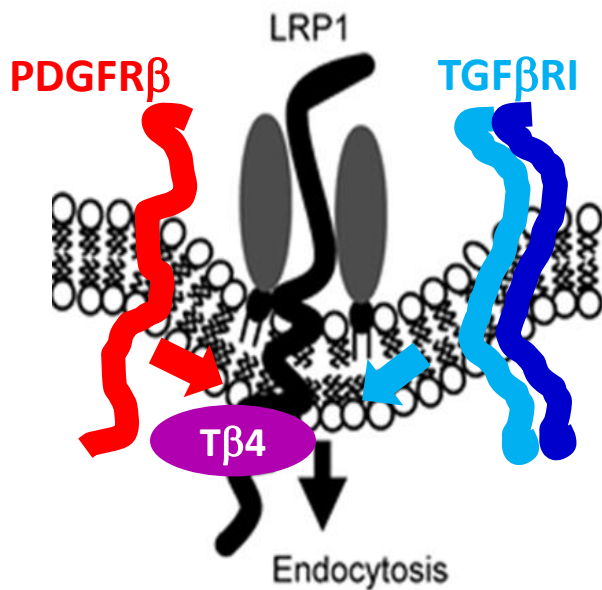
T β 4 KO mice: Vascular Defects in Adulthood



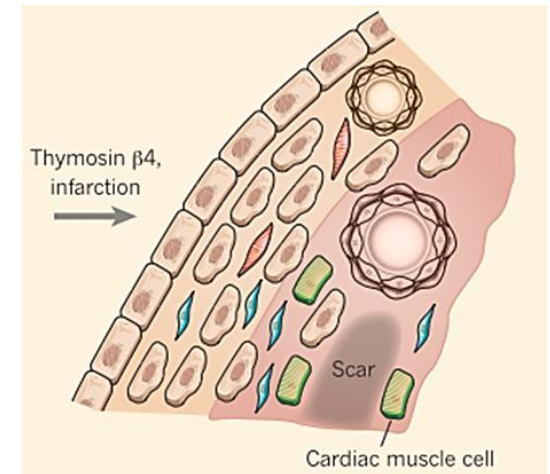


BHF Senior Basic Science Research Fellowship:

“Augmenting Epicardial-Based Regeneration and Vascular Protection via Thymosin β 4”



Maintenance of Vascular
Stability



Cardiac Regeneration
(via Epicardium)

Routes to Group Leader

- Fellowship (Internal/External)
- Lectureship

Why a Fellowship?

- Academic Freedom (3-5 years+)
- Option to spend time in another lab (overseas)
- No teaching requirements
- Chance to establish a team (RA); strong position to apply for funding
- Independent publications
- Flexibility (financial; useful position if you want to move)
- Prestige
- Writing the application will help to clearly define the next step of your career



Fellowships

If successful, this will...

- Further your research, enable research visits
- Boost your career and self-confidence, raise your profile, give you (some) independence
- Build or maintain your team (post-docs and research assistants)
- Strengthen collaborations, networks
- Expose you to new opportunities

Even if you're unsuccessful, you will

- Receive feedback from (expert) reviewers and panel
- Learn from the experience and improve your chances next time
- You have thought through ideas, approached collaborators and set the wheels in motion
- Option to resubmit?
- Fellowships: can apply to several funding bodies simultaneously

Although...

The disadvantages (depending on your point of view):

- Time at the bench 
- Time teaching  (Lectureship vs Fellowship)
- Time dealing with administration 
- Time spent seeking (and worrying about maintaining) funding 
to run the lab

Developing Your Career: a Fellowship Option for Every Stage

PhD/Postdoctoral is about TRAINING

- **Acquire range of skills**
- **Equips you with the knowledge and awareness to ask the right questions**

Postdoctoral/Intermediate Fellowship is about DEVELOPMENT

- **Learn to lead a small scientific team**
- **Learn new techniques**
- **Experience in a second lab?**

Senior Fellowship is about ESTABLISHMENT

- **Grow your research team**
- **Be internationally recognised by the end**

Fellowship Applications

For successful Fellowship Applications (3 Ps)

- Person i.e. you!
- Project
- Place

Before you start any application...

Is the institution the best place to do the work?

Do you have the right mentors, co-applicants and collaborators?

Does the project play to your strengths?

If not, you may want to think about moving or changing direction of research

Timing of application is key

Are You Ready to Apply for Your Own Funding?

When is the right time?

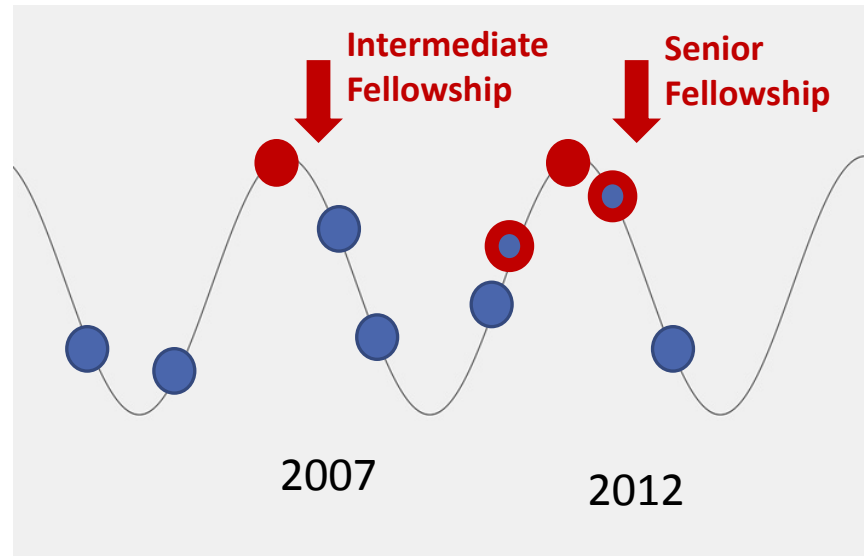
It's never too early...

... but it's perfectly acceptable in the early years to take time to gain experience and develop your own ideas

Choosing the right time for you is important

Note limits of funders (years post-PhD)

When to apply?



Q: What's the minimal CV that's good enough to apply for first Fellowship/PI position?

IF > 30 (Nature, Cell, Science) – go for it!

IF 8-15 (PNAS, PLoS Biology, Genes & Development, Circulation) – very competitive

IF 5-8 – if you have several, you'll be competitive

IF < 5 – it will be tough

The challenges of being a Principal Investigator

- For Fellows, difficulty in securing faculty (tenured) post
- Delayed job security
- Publication pressures (where we publish seen as more important than what we publish)
- Funding pressures
- Building your own niche; biological sciences have become much more multidisciplinary

Some advice

- Fellowships are competitive – be prepared to apply several times before you succeed
- Make use of collaborators
- Importance of communication
- Networking
- Protect your time

Personal qualities and skills you (ideally) need to be a successful academic

Personal attributes

- Enthusiasm
- Hard work
- Self-motivation
- Determination and commitment (particularly through the tough times)!

What are the skills needed?

- Time management
- Resilience
- Presentation Skills
- Networking
- Leadership and Management

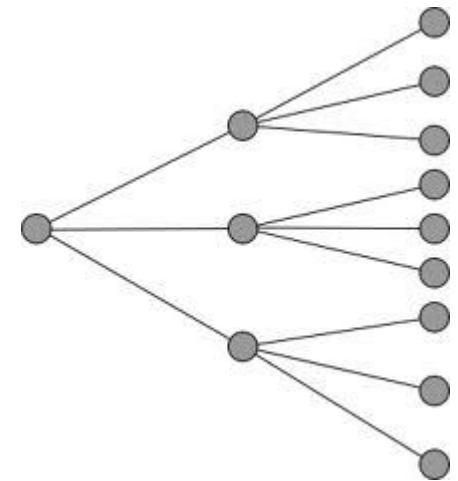
Luck is definitely required... (but you can help it along)

- 1) Be prepared to work really hard
- 2) Work with PIs that publish a lot (and high impact)
- 3) Work with PIs that are leaders in their fields (“state of the art”)
- 4) Try to be ambitious yet realistic about the likelihood of your project achieving its aims
(risk vs reward)



Networking

- Positive attitude towards meeting potential collaborators
- Identify relevant people who may be future collaborators/employers
- Attend the right conferences and present your research
- Online networking: LinkedIn, Mendeley etc.
- The more people you know in your field, the easier it is to meet others
- And once you know enough people, you will enjoy networking!





The ESC Scientists of Tomorrow

by the Council on Basic Cardiovascular Science

Charalambos Antoniades
Jérémy Fauconnier
Senka Ljubojevic
Nicola Smart
Samuel Sossalla
Gemma Vilahur

To become the voice of young scientists in the council, paving the way of its future

Scientists of Tomorrow



by the Council on Basic Cardiovascular Science

We are:

a new group of young proactive basic and clinical researchers

- Basic scientists / Clinician scientists
- Junior PIs/post doctoral Fellows
- Wide spectrum of Cardiovascular research fields



Charalambos Antoniades, United Kingdom
Area of expertise: Vascular Biology/Atherosclerosis



Jérémy Fauconnier, France
Area of expertise: *Calcium signalling*



Senka Ljubojevic, Austria
Area of expertise: *Subcellular calcium imaging*



Nicola Smart, United Kingdom
Area of expertise: *Cardiovascular development and regeneration*



Samuel Sossalla, Germany
Area of expertise: *Cellular electrophysiology*



Gemma Vilahur, Spain
Area of expertise: *Ischemic heart disease and cardiovascular protection*

We aim to:

promote and increase the visibility of the basic cardiovascular research

1) promote educational programs to young scientists



2) support career development of young investigators

**Outstanding Achievement Award
ESC First Contact Initiative Grant
ESC Basic Research Fellowship**

3) disseminate findings from basic research to the public



4) encourage gender equality in basic research



5) connect young scientists and the leaders of the field



6) engage clinicians in basic research

**New mechanisms
New targets
New therapies**

For more information, talk to us:

Nicola Smart & Samuel Sossalla are here.....



Please connect to the Scientists of Tomorrow

Become a SoT member via Linked in

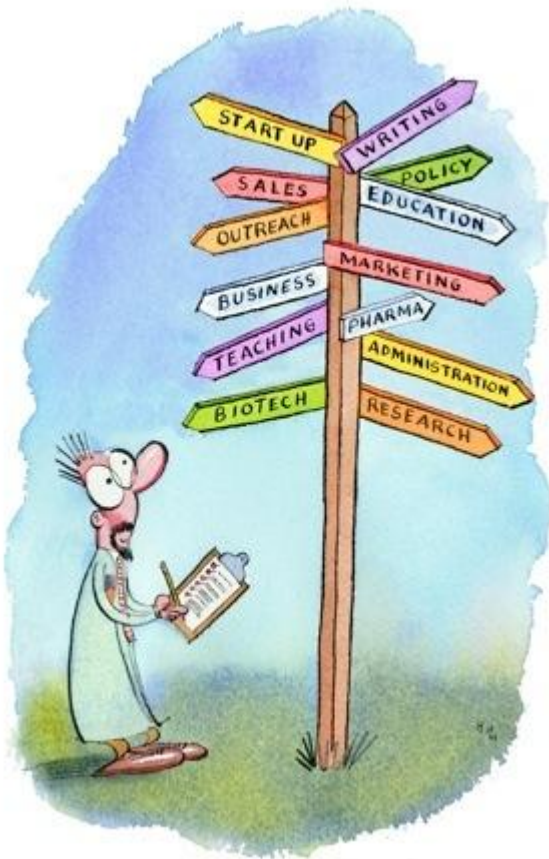


- Visit the SoT sessions at the ESC congresses
- Read our newsletters
- Watch our podcasts
- 2 nucleus members will retire in 2015→new elections 2015
- Check out for our online activities (e.g.information on grants, awards)

Email SoT Address: sot@escardio.org

Webpage:

<http://www.escardio.org/communities/councils/CBCS/Pages/scientists-of-tomorrow.aspx>



myIDP provides:

- Exercises to help you examine your skills, interests, and values
- A list of 20 scientific career paths with a prediction of which ones best fit your skills and interests
- A tool for setting strategic goals for the coming year, with optional reminders to keep you on track
- Articles and resources to guide you through the process

<http://myidp.sciencecareers.org/>

Thank You for Listening

and

Good Luck